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Summary

Research

I am currently leading and managing the Biometrics Security and Privacy group for nearly 16 years. Currently the group is composed of 14 non-permanent scientists (PhDs, PostDocs, Researchers). As of today I secured more than 15'000'000 CHF of funding for Idiap (including overheads) from various research projects (SNF, CTI/Innosuisse, Hasler, EU, IARPA/DARPA, companies). I was the principal investigator or involved in research projects on face/speaker recognition, face/speaker presentation attack detection (aka anti-spoofing – **pioneering the work in face presentation attack detection**), mobile biometrics, vein biometrics and deep-fakes detection.

Teaching

- University of Lausanne (UNIL): Since 2018 I am teaching a new yearly Master course on “Biometrics” at the University of Lausanne (Faculty of Law, Criminal Justice and Public Administration) in the Master of Science (MSc) Forensic Science. This course introduces to the analysis, modeling and interpretation of biometric data for biometric person recognition and forensic biometrics.
- Ecole polytechnique fédérale de Lausanne (EPFL): I was teaching the EPFL Doctoral program course on “Fundamentals in Statistical Pattern Recognition” (EE-612) every 2 years since Spring 2013 until 2025. This course presents the functioning details of fundamental models, ranging from regression and classification to probability distribution modeling.

Innovation and technology transfer

- **Open Source:** Torchvision (<https://doi.org/10.1145/1873951.1874254>), Bob (<https://www.idiap.ch/software/bob>) and BEAT (<https://www.idiap.ch/software/beat/>).
- **Technology Transfer:** KeyLemon, BioWatch, Global ID, Privately, Google, Huawei, SICPA, Stellantis.
- **Patents:** 5 patents on BEAT, on vein biometrics and on template protection.

Service to the community

- Service to UNIL: teaching, serving a PhD jury member, supervising UNIL Master students.
- Service to EPFL: teaching, serving a PhD jury member, hosting EPFL Bachelor/Master students.
- Service to community: Vice-President Conferences (IEEE Biometrics Council), Associate Editor for IEEE Transactions on Information Forensics and Security, IEEE Signal Processing Letters and IEEE Transactions on Biometrics, Behavior, and Identity Science, Co-Editor Springer Handbook of Biometric Anti-Spoofing, Guest Editor IEEE Signal Processing Magazine and IEEE Transactions on Information Forensics and Security, Program Committees member, Doctoral Consortium Chair, Competition Chair and Area Chair.

1 Curriculum vitae

1.1 Personal data

- Nationality: French and Swiss
- Date of birth: 23th of July 1973 (France)
- Personal address:
Sébastien Marcel,
Bonnes Luites 55A, 1920 Martigny, Valais (Switzerland)
- Professional address (and contact):
Prof Sébastien Marcel,
Idiap Research Institute,
Rue Marconi 19, 1920 Martigny, Valais (Switzerland)
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WWW: <http://www.idiap.ch/~marcel>
- Languages: French (mother tongue) and English

1.2 Education

- **Ph.D.**, Signal Processing and Telecommunications (2000)
Université de Rennes I, Rennes, France
- **M.A.S.**, Artificial Intelligence (1996)
Université Paul Sabatier, Toulouse, France
- **M.Sc.**, Computer Science (1995)
Université de Limoges, Limoges, France

1.3 Employment history

- Professeur titulaire (external appointment since 2021),
Faculty of Law, Criminal Justice and Public Administration,
School of Criminal Justice,
Université de Lausanne (UNIL)
- Member of the Direction ad interim (since June 10 2025),
Idiap Research Institute
- Senior Member of the Research Staff (since 2010),
Head of the Biometrics Security and Privacy group, Idiap Research Institute
- Lecturer (2018–2021), Université de Lausanne (UNIL)
- Lecturer (2013–2023), École Polytechnique Fédérale de Lausanne (EPFL)
- Scientific Head of Programme CAS Biometrics and Privacy (2017–2019), UniDistance (Switzerland)
- Visiting Associate Professor (Jan-Feb 2010), University of Cagliari (Italy)
- Research scientist (2001–2009), Idiap Research Institute (Switzerland)
- R&D Engineer (1997–2000), Orange Labs (France)

2 Publications

2.1 Summary of publication and citation records

Summary
23833 citations, h-index 76 .
Source: Google Scholar , April 12th 2026.

Figure 1: List of the 10 most cited papers (number of citations and year of publication).

On the effectiveness of local binary patterns in face anti-spoofing I Chingovska, A Anjos, S Marcel 2012 BIOSIG-proceedings of the international conference of biometrics ...	1253	2012
Deepfakes: a new threat to face recognition? assessment and detection P Korshunov, S Marcel arXiv preprint arXiv:1812.08685	904	2018
Image quality assessment for fake biometric detection: Application to iris, fingerprint, and face recognition J Galbally, S Marcel, J Fierrez IEEE transactions on image processing 23 (2), 710-724	780	2013
Person authentication using brainwaves (EEG) and maximum a posteriori model adaptation S Marcel, JR Millán IEEE transactions on pattern analysis and machine intelligence 29 (4), 743-752	689	2007
Torchvision the machine-vision package of torch S Marcel, Y Rodriguez Proceedings of the 18th ACM international conference on Multimedia, 1485-1488	650	2010
Biometric antispoofing methods: A survey in face recognition J Galbally, S Marcel, J Fierrez IEEE Access 2, 1530-1552	540	2014
Counter-measures to photo attacks in face recognition: a public database and a baseline A Anjos, S Marcel 2011 International joint conference on Biometrics (IUCB), 1-7	445	2011
LBP - TOP Based Countermeasure against Face Spoofing Attacks T de Freitas Pereira, A Anjos, JM De Martino, S Marcel Asian conference on computer vision, 121-132	431	2012
Spoofing in 2d face recognition with 3d masks and anti-spoofing with kinect N Erdogmus, S Marcel 2013 IEEE sixth international conference on biometrics: theory, applications ...	406	2013
Spoofing face recognition with 3D masks N Erdogmus, S Marcel IEEE transactions on information forensics and security 9 (7), 1084-1097	373	2014

2.2 List of publications (last 5 years only for sake of space)

Peer Reviewed Journal Articles

- [12] Ketan Kotwal and Sébastien Marcel. “Review of Demographic Fairness in Face Recognition”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2025).
- [16] Hatef Otroshi Shahreza, Anjith George, Rahimi Parsa, Alexander Unnervik, and Sébastien Marcel. “Second FRCSyn-onGoing: Winning Solutions and Post-Challenge Analysis to Improve Face Recognition with Synthetic Data”. In: *Information Fusion* (2025).
- [18] Hatef Otroshi Shahreza and Sébastien Marcel. “Foundation Models and Biometrics: A Survey and Outlook”. In: *IEEE Transactions on Information Forensics and Security* (2025). DOI: [10.1109/TIFS.2025.3602233](https://doi.org/10.1109/TIFS.2025.3602233). URL: <https://ieeexplore.ieee.org/document/11137396>.
- [27] Anjith George, Christophe Ecabert, Hatef Otroshi Shahreza, Ketan Kotwal, and Sébastien Marcel. “EdgeFace: Efficient Face Recognition Model for Edge Devices”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2024). DOI: [10.1109/TBIOM.2024.3352164](https://doi.org/10.1109/TBIOM.2024.3352164).
- [28] Anjith George and Sébastien Marcel. “From Modalities to Styles: Rethinking the Domain Gap in Heterogeneous Face Recognition”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2024). DOI: [10.1109/TBIOM.2024.3365350](https://doi.org/10.1109/TBIOM.2024.3365350).
- [37] Hatef Otroshi Shahreza, Anjith George, and Sébastien Marcel. “Knowledge Distillation for Face Recognition using Synthetic Data with Dynamic Latent Sampling”. In: *IEEE Access* (2024).
- [38] Hatef Otroshi Shahreza, Vedrana Krivokuca, and Sébastien Marcel. “Vulnerability of State-of-the-Art Face Recognition Models to Template Inversion Attack”. In: *IEEE Transactions on Information Forensics and Security* (2024). DOI: [10.1109/TIFS.2024.3381820](https://doi.org/10.1109/TIFS.2024.3381820).
- [41] Hatef Otroshi Shahreza and Sébastien Marcel. “Template Inversion Attack Using Synthetic Face Images Against Real Face Recognition Systems”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2024). DOI: [10.1109/TBIOM.2024.3391759](https://doi.org/10.1109/TBIOM.2024.3391759).
- [43] Hatef Otroshi Shahreza, Yanina Shkel, and Sébastien Marcel. “On Measuring Linkability of Multiple Protected Biometric Templates using Maximal Leakage”. In: *IEEE Access* (2024). DOI: [10.1109/ACCESS.2024.3433536](https://doi.org/10.1109/ACCESS.2024.3433536).
- [46] Behrooz Razeghi, Marzieh Gheisari, Amir Atashin, Dimche Kostadinov, Sébastien Marcel, Deniz Gunduz, and Slava Voloshynovskiy. “Group Membership Verification via Nonlinear Sparsifying Transform Learning”. In: *IEEE Access* (2024). DOI: [10.1109/ACCESS.2024.3417301](https://doi.org/10.1109/ACCESS.2024.3417301).
- [53] Mathias Ibsen, Christian Rathgeb, Fabian Brechtel, Ruben Klepp, Katrin Pöppelmann, Anjith George, Sébastien Marcel, and Christoph Busch. “Attacking Face Recognition With T-Shirts: Database, Vulnerability Assessment, and Detection”. In: *IEEE Access* (2023). DOI: [10.1109/ACCESS.2023.3282780](https://doi.org/10.1109/ACCESS.2023.3282780).
- [61] Hatef Otroshi Shahreza and Sébastien Marcel. “Comprehensive Vulnerability Evaluation of Face Recognition Systems to Template Inversion Attacks Via 3D Face Reconstruction”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2023). DOI: [10.1109/TPAMI.2023.3312123](https://doi.org/10.1109/TPAMI.2023.3312123).
- [63] Hatef Otroshi Shahreza, Yanina Shkel, and Sébastien Marcel. “Measuring Linkability of Protected Biometric Templates Using Maximal Leakage”. In: *IEEE Transactions on Information Forensics and Security* (2023). DOI: [10.1109/TIFS.2023.3266170](https://doi.org/10.1109/TIFS.2023.3266170).
- [64] Hatef Otroshi Shahreza, Alexandre Veuthey, and Sébastien Marcel. “Toward High-Resolution Face Image Generation From Coded Aperture Camera”. In: *IEEE Sensors Letters* (2023). DOI: [10.1109/LENS.2023.3315248](https://doi.org/10.1109/LENS.2023.3315248).
- [67] Anjith George, Amir Mohammadi, and Sébastien Marcel. “Prepended Domain Transformer: Heterogeneous Face Recognition without Bells and Whistles”. In: *IEEE Transactions on Information Forensics and Security* (2022).
- [70] Ketan Kotwal, Sushil Bhattacharjee, Philip Abbet, Zohreh Mostaani, Huang Wei, Xu Wenkang, Zhao Yaxi, and Sébastien Marcel. “Domain-Specific Adaptation of CNN for Detecting Face Presentation Attacks in NIR”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2022).
- [73] Vedrana Krivokuca and Sébastien Marcel. “Biometric Template Protection for Neural-Network-based Face Recognition Systems: A Survey of Methods and Evaluation Techniques”. In: *IEEE Transactions on Information Forensics and Security* (2022). URL: <https://arxiv.org/abs/2110.05044v4>.
- [74] Vedrana Krivokuca and Sébastien Marcel. “Towards Protecting Face Embeddings in Mobile Face Verification Scenarios”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* 4.1 (2022), pp. 117–134. ISSN: 2637-6407. DOI: [10.1109/TBIOM.2022.3140472](https://doi.org/10.1109/TBIOM.2022.3140472).
- [80] Meysam Shamsi, Anthony Larcher, Loïc Barrault, Sylvain Meignier, Yevhenii Prokopalo, Marie Tahon, Ambuj Mehrish, Simon Petitrenaud, Olivier Galibert, Samuel Gaist, André Anjos, Sébastien Marcel, and Marta Costa-Jussà. “Towards Lifelong Human Assisted Speaker Diarization”. In: *Computer Speech and Language* (2022). DOI: [10.1016/j.csl.2022.101437](https://doi.org/10.1016/j.csl.2022.101437). URL: <https://www.sciencedirect.com/science/article/pii/S0885230822000638>.

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- [84] Tiago de Freitas Pereira and Sébastien Marcel. “Fairness in Biometrics: a figure of merit to assess biometric verification systems”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2021). URL: <http://publications.idiap.ch/index.php/publications/show/4463>.
 - [88] Anjith George and Sébastien Marcel. “Scalability Study on Multi-channel Biometric Face Presentation Attack Detection”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2021). (under review).
 - [90] Pavel Korshunov and Sébastien Marcel. “Improving Generalization of Deepfake Detection with Data Farming and Few-Shot Learning”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2021). URL: <http://publications.idiap.ch/index.php/publications/show/4754>.
 - [94] Hatef Otroschi and Sébastien Marcel. “Towards Protecting and Enhancing Finger Vein Recognition methods via Biohashing and Deep Neural Networks”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2021). DOI: [10.1109/TBIOM.2021.3076444](https://doi.org/10.1109/TBIOM.2021.3076444). URL: <https://publications.idiap.ch/index.php/publications/show/4545>.
 - [96] Anjith George and Sébastien Marcel. “Learning One Class Representations for Face Presentation Attack Detection using Multi-channel Convolutional Neural Networks”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2020). DOI: [10.1109/TIFS.2020.3013214](https://doi.org/10.1109/TIFS.2020.3013214). URL: <https://publications.idiap.ch/index.php/publications/show/4347>.
 - [97] Guillaume Heusch, Anjith George, David Geissenbuhler, Zohreh Mostaani, and Sébastien Marcel. “Deep Models and Short-wave Infrared Information to Detect Face Presentation Attacks”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2020). DOI: [10.1109/TBIOM.2020.3010312](https://doi.org/10.1109/TBIOM.2020.3010312). URL: <https://publications.idiap.ch/index.php/publications/show/4325>.

Peer Reviewed Book Chapters

- [86] Anjith George and Sébastien Marcel. “Multi-channel Face Presentation Attack Detection Using Deep Learning”. In: *Deep Learning-Based Face Analytics*. Ed. by Nalini Ratha, Vishal Patel, and Rama Chellappa. Springer, 2021. Chap. 13.

Books

- [75] S. Marcel, J. Fierrez, and N. Evans. *Handbook of Biometric Anti-Spoofing (Ed 3)*. Springer, 2022.

Peer Reviewed Conference Proceedings

- [1] Hatef Otroschi Shahreza and Sébastien Marcel. “Benchmarking Multimodal Large Language Models for Face Recognition”. In: *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2026. URL: <https://www.idiap.ch/paper/facerecbench/>.
- [2] David Geissbühler, Hatef Otroschi Shahreza, and Sébastien Marcel. “Synthetic Face Datasets Generation via Latent Space Exploration from Brownian Identity Diffusion”. In: *International Conference on Machine Learning*. 2025.
- [3] Anjith George and Sébastien Marcel. “Digi2Real: Bridging the Realism Gap in Synthetic Data Face Recognition via Foundation Models”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2025.
- [4] Anjith George and Sébastien Marcel. “EdgeDoc: Hybrid CNN-Transformer Model for Accurate Forgery Detection and Localization in ID Documents”. In: *ICCV*. 2025.
- [5] Anjith George and Sébastien Marcel. “Enhancing Domain Diversity in Synthetic Data Face Recognition with Dataset Fusion”. In: *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*. 2025.
- [6] Anjith George and Sébastien Marcel. “The Invisible Threat: Evaluating the Vulnerability of Cross-Spectral Face Recognition to Presentation Attacks”. In: *International Joint Conference on Biometrics (IJCB 2025), IEEE*. 2025.
- [7] Anjith George and Sébastien Marcel. “xEdgeFace: Efficient Cross-Spectral Face Recognition for Edge Devices”. In: *International Joint Conference on Biometrics (IJCB 2025), IEEE*. 2025.
- [8] Alain Komaty, Hatef Otroschi Shahreza, Anjith George, and Sébastien Marcel. “Exploring ChatGPT for Face Presentation Attack Detection in Zero and Few-Shot in-Context Learning”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2025.
- [9] Pavel Korshunov, Ketan Kotwal, Christophe Ecabert, Vidit Vidit, Amir Mohammadi, and Sébastien Marcel. “Investigation of accuracy and bias in face recognition trained with synthetic data”. In: *Proceedings of IEEE International Joint Conference on Biometrics*. 2025.
- [10] Pavel Korshunov, Amir Mohammadi, Vidit Vidit, Christophe Ecabert, and Sébastien Marcel. “FantasyID: A dataset for detecting digital manipulations of ID-documents”. In: *Proceedings of IEEE International Joint Conference on Biometrics*. 2025.

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- [11] Pavel Korshunov, Vidit Vidit, Amir Mohammadi, Christophe Ecabert, Nevena Shamoska, Sébastien Marcel, Zeqin Yu, Ye Tian, Jiangqun Ni, Lazar Lazarevic, Renat Khizbullin, Anastasiia Evteeva, Alexey Tochin, Aleksei Grishin, Anjith George, Daniel DeAlcala, Tamas Endrei, Javier Munoz-Haro, Ruben Tolosana, Ruben Vera-Rodriguez, Aythami Morales, Julian Fierrez, Gyorgy Cserey, Hardik Sharma, Sachin Chaudhary, Akshay Dudhane, Praful Hambarde, Amit Shukla, Prateek Shaily, Jayant Kumar, Ajinkya Hase, Satish Maurya, Mridul Sharma, and Pallav Dwivedi. “DeepID Challenge of Detecting Synthetic Manipulations in ID Documents”. In: *International Conference on Computer Vision (ICCV)*. 2025.
- [13] Michiel van der Meer, Pavel Korshunov, Sébastien Marcel, and Lonneke van der Plas. “HintsOfTruth: A Multimodal Checkworthiness Detection Dataset with Real and Synthetic Claims”. In: *The 63rd Annual Meeting of the Association for Computational Linguistics*. 2025.
- [14] Hatef Otroschi Shahreza, Laurent Colbois, and Sébastien Marcel. “3D Face Morph Generation Using Geometry-Aware Template Inversion”. In: *Proceedings of the IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*. 2025. DOI: [10.1109/MLSP62443.2025.11204286](https://doi.org/10.1109/MLSP62443.2025.11204286). URL: <https://ieeexplore.ieee.org/abstract/document/11204286>.
- [15] Hatef Otroschi Shahreza, Anjith George, and Sébastien Marcel. “Face Reconstruction from Face Embeddings using Adapter to a Face Foundation Model”. In: *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*. 2025.
- [17] Hatef Otroschi Shahreza and Sébastien Marcel. “FaceLLM: A Multimodal Large Language Model for Face Understanding”. In: *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*. 2025. URL: <https://arxiv.org/pdf/2507.10300>.
- [19] Hatef Otroschi Shahreza and Sébastien Marcel. “HyperFace: Generating Synthetic Face Recognition Datasets by Exploring Face Embedding Hypersphere”. In: *International Conference on Learning Representations*. 2025.
- [20] Rahimi Parsa, Damien Teney, and Sébastien Marcel. “AugGen: Synthetic Augmentation using Diffusion Models Can Improve Recognition”. In: *The Thirty-ninth Annual Conference on Neural Information Processing Systems*. 2025.
- [21] Francois Poh, Anjith George, and Sébastien Marcel. “ArtFace: Towards Historical Portrait Face Identification via Model Adaptation”. In: *(Non-Archival)*. 2025, p. 4. URL: <https://www.idiap.ch/paper/artface/>.
- [22] Luis S. Luevano, Pavel Korshunov, and Sébastien Marcel. “Identity-Preserving Aging and De-Aging of Faces in the StyleGAN Latent Space”. In: *2025 IEEE International Joint Conference on Biometrics (IJCB)*. IEEE, 2025.
- [23] Juan E. Tapia, Nieto Mario, Juan Espin, Alvaro Sanchez, Naser Damer, Christoph Busch, Marija Ivanovska, Leon Todorov, Renat Khizbullin, Aleksei Grishin, Lazar Lazarevic, Daniel Schulz, Sebastian Gonzalez, Amir Mohammadi, Ketan Kotwal, Sébastien Marcel, Raghavendra Mudgalgundurao, Kiran B. Raja, Patrick Schuch, Pedro Couto, Joao Pinto, Mariana Xavier, Andres Valenzuela, Borut Batagelj, Javier Barrachina, Marko Peterlin, Peter Peer, Ajnas Muhammed, Diogo Nunes, Nuno Gonçalves, Sushrut Patwardhan, and Raghavendra Ramachandra. “Second Competition on Presentation Attack Detection on ID Card”. In: *IEEE International Joint Conference on Biometrics (IJCB)*. 2025.
- [24] Vidit Vidit, Pavel Korshunov, Amir Mohammadi, Christophe Ecabert, Ketan Kotwal, and Sébastien Marcel. “Detecting Text Manipulation in Images using Vision Language Models”. In: *36th British Machine Vision Conference 2025*. 2025.
- [25] Sushil Bhattacharjee, David Geissbuhler, Guillaume Clivaz, Ketan Kotwal, and Sébastien Marcel. “Vascular Biometrics Experiments on CANDY – A New Contactless Finger-Vein Dataset”. In: *IAPR International Conference on Pattern Recognition*. 2024.
- [26] Laurent Colbois and Sébastien Marcel. “Evaluating the Effectiveness of Attack-Agnostic Features for Morphing Attack Detection”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [29] Anjith George and Sébastien Marcel. “Heterogeneous Face Recognition Using Domain Invariant Units”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024.
- [30] Anjith George and Sébastien Marcel. “Modality Agnostic Heterogeneous Face Recognition with Switch Style Modulators”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [31] Ahmad Hassanpour, Yasamin Kowsari, Hatef Otroschi Shahreza, Bian Yang, and Sébastien Marcel. “ChatGPT and biometrics: an assessment of face recognition, gender detection, and age estimation capabilities”. In: *IEEE International Conference on Image Processing*. 2024.
- [32] Ketan Kotwal and Sébastien Marcel. “Demographic Fairness Transformer for Bias Mitigation in Face Recognition”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [33] Ketan Kotwal and Sébastien Marcel. “Mitigating Demographic Bias in Face Recognition via Regularized Score Calibration”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2024.
- [34] Ketan Kotwal, Gokhan Ozbulak, and Sébastien Marcel. “Assessing the Reliability of Biometric Authentication on Virtual Reality Devices”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [35] Yu Linghu, Tiago de Freitas Pereira, Christophe Ecabert, Sébastien Marcel, and Manuel Güther. “Score Normalization for Demographic Fairness in Face Recognition”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.

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- [36] Hatef Otroschi Shahreza, Christophe Ecabert, Anjith George, Alexander Unnervik, and Sébastien Marcel. “SDFR: Synthetic Data for Face Recognition Competition”. In: *IEEE International Conference on Automatic Face and Gesture Recognition*. 2024.
- [39] Hatef Otroschi Shahreza and Sébastien Marcel. “Breaking Template Protection: Reconstruction of Face Images from Protected Facial Templates”. In: *IEEE International Conference on Automatic Face and Gesture Recognition*. 2024.
- [40] Hatef Otroschi Shahreza and Sébastien Marcel. “Face Reconstruction from Partially Leaked Facial Embeddings”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024. DOI: [10.1109/ICASSP48485.2024.10445870](https://doi.org/10.1109/ICASSP48485.2024.10445870).
- [42] Hatef Otroschi Shahreza and Sébastien Marcel. “Unveiling Synthetic Faces: How Synthetic Datasets Can Expose Real Identities”. In: *Neural Information Processing Systems (NeurIPS) workshop on New Frontiers in Adversarial Machine Learning*. 2024.
- [44] Hatef Otroschi Shahreza, Alexandre Veuthey, and Sébastien Marcel. “Face Recognition Using Lensless Camera”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024. DOI: [10.1109/ICASSP48485.2024.10446710](https://doi.org/10.1109/ICASSP48485.2024.10446710).
- [45] Nathan Ramoly, Alain Komaty, Vedrana Krivokuca, Lara Younes, Ahmad-Montaser Awal, and Sébastien Marcel. “A Novel and Responsible Dataset for Face Presentation Attack Detection on Mobile Devices”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [47] Behrooz Razeghi, Parsa Rahimi, and Sébastien Marcel. “Deep Variational Privacy Funnel: General Modeling with Applications in Face Recognition”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024.
- [48] Alexander Unnervik, Hatef Otroschi Shahreza, Anjith George, and Sébastien Marcel. “HyperFace: Generating Synthetic Face Recognition Datasets by Exploring Face Embedding Hypersphere”. In: *Neural Information Processing Systems (NeurIPS) workshop on Safe Generative AI*. 2024.
- [49] Alexander Unnervik, Hatef Otroschi Shahreza, Anjith George, and Sébastien Marcel. “Model Pairing Using Embedding Translation for Backdoor Attack Detection on Open-Set Classification Tasks”. In: *Neural Information Processing Systems (NeurIPS) workshop on Safe Generative AI*. 2024.
- [50] Laurent Colbois, Hatef Otroschi Shahreza, and Sébastien Marcel. “Approximating Optimal Morphing Attacks using Template Inversion”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [51] Ziga Emersic, Tetsushi Ohki, Muku Akasaka, Takahiko Arakawa, Soshi Maeda, Masora Okano, Yuya Sato, Anjith George, Sebastien Marcel, Iyyakutti Iyappan Ganapathi, Syed Sadaf Ali, Sajid Javed, Naoufel Werghi, Selin Gok Isik, Erdi Saritas, Hazim Kemal Ekenel, Valter Hudovernik, Jan Niklas Kolf, Fadi Boutros, Naser Damer, Geetanjali Sharma, Aman Kamboj, Aditya Nigam, Deepak Kumar Jain, Guillermo Camara, Peter Peer, and Vitomir Struc. “The Unconstrained Ear Recognition Challenge 2023: Maximizing Performance and Minimizing Bias”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [52] Anjith George and Sébastien Marcel. “Bridging the Gap: Heterogeneous Face Recognition with Conditional Adaptive Instance Modulation”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [54] Jan Niklas Kolf, Fadi Boutros, Jurek Elliesen, Markus Theuerkauf, Naser Damer, Mohamad Alansari, Oussama Abdul Hay, Sara Alansari, Sajid Javed, Naoufel Werghi, Klemen Grm, Vitomir Struc, Fernando Alonso-Fernandez, Kevin Hernandez Diaz, Josef Bigun, Anjith George, Christophe Ecabert, Hatef Otroschi Shahreza, Ketan Kotwal, Sébastien Marcel, Iurii Medvedev, Bo Jin, Diogo Nunes, Ahmad Hassanpour, Pankaj Khatiwada, Aafan Ahmad Toor, and Bian Yang. “EFAr 2023: Efficient Face Recognition Competition”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [55] Alain Komaty, Vedrana Krivokuca, Christophe Ecabert, and Sébastien Marcel. “Can personalised hygienic masks be used to attack face recognition systems?” In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [56] Pavel Korshunov, Haolin Chen, Philip N. Garner, and Sébastien Marcel. “Vulnerability of Automatic Identity Recognition to Audio-Visual Deepfakes”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [57] Pietro Melzi, Hatef Otroschi Shahreza, Christian Rathgeb, Ruben Tolosana, Ruben Vera-Rodriguez, Julian Fierrez, Sébastien Marcel, and Christoph Busch. “Multi-IVE: Privacy Enhancement of Multiple Soft-Biometrics in Face Embeddings”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2023.
- [58] Hatef Otroschi Shahreza, Anjith George, and Sébastien Marcel. “SynthDistill: Face Recognition with Knowledge Distillation from Synthetic Data”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [59] Hatef Otroschi Shahreza, Vedrana Krivokuca, and Sébastien Marcel. “MLP-Hash: Protecting Face Templates via Hashing of Randomized Multi-Layer Perceptron”. In: *European Signal Processing Conference (EUSIPCO)*. 2023.
- [60] Hatef Otroschi Shahreza and Sébastien Marcel. “Blackbox Face Reconstruction from Deep Facial Embeddings Using A Different Face Recognition Model”. In: *IEEE International Conference on Image Processing (ICIP)*. 2023. DOI: [10.1109/ICIP49359.2023.10222312](https://doi.org/10.1109/ICIP49359.2023.10222312).
- [62] Hatef Otroschi Shahreza and Sébastien Marcel. “Face Reconstruction from Facial Templates by Learning Latent Space of a Generator Network”. In: *Conference on Neural Information Processing Systems (NeurIPS)*. 2023.
- [65] Parsa Rahimi, Christophe Ecabert, and Sébastien Marcel. “Toward responsible face datasets: modeling the distribution of a disentangled latent space for sampling face images from demographic groups”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.

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- [66] Laurent Colbois and Sébastien Marcel. “On the detection of morphing attacks generated by GANs”. In: *21st International Conference of the Biometrics Special Interest Group (BIOSIG 2022)*. 2022.
- [68] Pavel Korshunov, Anubhav Jain, and Sébastien Marcel. “Custom attribution loss for improving generalization and interpretability of deepfake detection”. In: *International Conference on Acoustics, Speech and Signal Processing*. 2022.
- [69] Pavel Korshunov and Sébastien Marcel. “Face Anthropometry Aware Audio-visual Age Verification”. In: *ACM Multimedia*. 2022.
- [71] Ketan Kotwal and Sébastien Marcel. “Fairness Index Measures to Evaluate Bias in Biometric Recognition”. In: *International Conference on Pattern Recognition Workshops*. 2022.
- [72] Ketan Kotwal and Sébastien Marcel. “Residual Feature Pyramid Network for Enhancement of Vascular Patterns”. In: *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops*. 2022.
- [76] Dailé Osorio-Roig, Christian Rathgeb, Hatef Otroshi Shahreza, Christoph Busch, and Sébastien Marcel. “Indexing Protected Deep Face Templates by Frequent Binary Patterns”. In: *Proceedings of the 2022 International Joint Conference on Biometrics (IJCB)*. 2022.
- [77] Hatef Otroshi Shahreza, Vedrana Krivokuca, and Sébastien Marcel. “Face Reconstruction from Deep Facial Embeddings using A Convolutional Neural Network”. In: *Proceedings of the 29th IEEE International Conference on Image Processing*. 2022.
- [78] Hatef Otroshi Shahreza, Christian Rathgeb, Dailé Osorio-Roig, Vedrana Krivokuca, Sébastien Marcel, and Christoph Busch. “Hybrid Protection of Biometric Templates by Combining Homomorphic Encryption and Cancelable Biometrics”. In: *Proceedings of the 2022 International Joint Conference on Biometrics (IJCB)*. 2022.
- [79] Eklavya Sarkar, Pavel Korshunov, Laurent Colbois, and Sébastien Marcel. “Are GAN-based Morphs Threatening Face Recognition?” In: *International Conference on Acoustics, Speech and Signal Processing*. 2022.
- [81] Alexander Unnervik and Sébastien Marcel. “An anomaly detection approach for backdoored neural networks: face recognition as a case study”. In: *21st International Conference of the Biometrics Special Interest Group (BIOSIG 2022)*. 2022.
- [82] Victor Bros, Ketan Kotwal, and Sébastien Marcel. “Vein Enhancement with Deep Auto-Encoders to improve Finger Vein Recognition”. In: *IEEE Biometrics Special Interest Group (BIOSIG)*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4648>.
- [83] Laurent Colbois, Tiago de Freitas, and Sébastien Marcel. “On the use of automatically generated synthetic image datasets for benchmarking face recognition”. In: *IEEE/IAPR International Joint Conference on Biometrics*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4567>.
- [85] Anjith George and Sébastien Marcel. “Cross Modal Focal Loss for RGBD Face Anti-Spoofing”. In: *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. 2021. URL: <http://publications.idiap.ch/index.php/publications/show/4506>.
- [87] Anjith George and Sébastien Marcel. “On the Effectiveness of Vision Transformers for Zero-shot Face Anti-Spoofing”. In: *IEEE/IAPR International Joint Conference on Biometrics*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4557>.
- [89] Anubhav Jain, Pavel Korshunov, and Sébastien Marcel. “Improving Generalization of Deepfake Detection by Training for Attribution”. In: *International Workshop on Multimedia Signal Processing*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4635>.
- [91] Pavel Korshunov and Sébastien Marcel. “Subjective and objective evaluation of deepfake videos”. In: *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4543>.
- [92] Hatef Otroshi, Vedrana Krivokuca, and Sébastien Marcel. “On the Recognition Performance of BioHashing on state-of-the-art Face Recognition models”. In: *Proceedings of the 13th IEEE International Workshop on Information Forensics and Security (WIFS)*. IEEE, 2021. DOI: [10.1109/WIFS53200.2021.9648382](https://doi.org/10.1109/WIFS53200.2021.9648382). URL: <https://ieeexplore.ieee.org/document/9648382>.
- [93] Hatef Otroshi and Sébastien Marcel. “Deep Auto-Encoding and Biohashing for Secure Finger Vein Recognition”. In: *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4544>.
- [95] Priyanka Das, Joseph McGrath, Zhaoyuan Fang, Aidan Boyd, Ganghee Jang, Amir Mohammadi, Sandip Purnapatra, David Yambay, Sébastien Marcel, Mateusz Trokielewicz, Piotr Maciejewicz, Kevin Bowyer, Adam Czajka, and Stephanie Schuckers. “Iris Liveness Detection Competition (LivDet-Iris) ? The 2020 Edition”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2020.
- [98] Ketan Kotwal and Sébastien Marcel. “CNN Patch Pooling for Detecting 3D Mask Presentation Attacks in NIR”. In: *IEEE International Conference on Image Processing (ICIP)*. 2020.
- [99] Amir Mohammadi, Sushil Bhattacharjee, and Sébastien Marcel. “Domain Adaptation For Generalization Of Face Presentation Attack Detection In Mobile Settings With Minimal Information”. In: *45th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2020.

Table 1: Evolution of the h-index over 10 years to reach 76 in 2026.

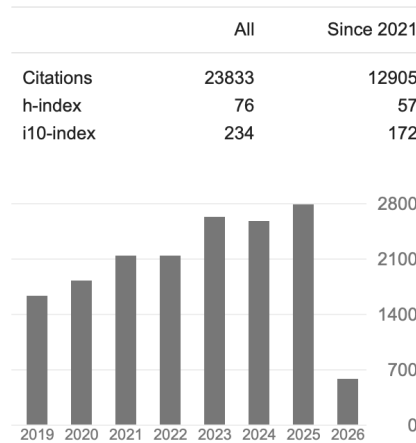
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
32	42	45	49	54	59	63	65	73	75	76

- [100] Amir Mohammadi, Sushil Bhattacharjee, and Sébastien Marcel. “Improving Cross-dataset Performance Of Face Presentation Attack Detection Systems Using Face Recognition Datasets”. In: *45th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2020.
- [101] Huy H. Nguyen, Junichi Yamagishi, Isao Echizen, and S. Marcel. “Generating Master Faces for Use in Performing Wolf Attacks on Face Recognition Systems”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2020.
- [102] Seyyed Saeed Sarfjoo, Madikeri, Srikanth, Petr Motlicek, and Sébastien Marcel. “Supervised domain adaptation for text-independent speaker verification using limited data”. In: *Proceedings of Interspeech*. 2020.

2.3 Citation record

Please find the evolution of the number of citations over the last 5 years in the Figure 2 and the evolution of the h-index over 10 years in Table 1.

Figure 2: Evolution of the number of citations over the last 5 years (source: Google Scholar).



3 Invited lectures

- “From Face Recognition to Deception: 20 Years in Biometrics and Synthetic Media” (**Keynote**), IICIP Workshop ”Authenticity and Provenance in the age of generative AI”, October 2025
- “From Face Recognition to Deception: 20 Years in Biometrics and Synthetic Media” (**Keynote**), IJCNN Workshop VERIMEDIA, July 2025
- “An overview of 20 years of research in biometrics and recent work”, EPFL IEM Seminar Series, May 2024
- “Biometrics Security”, University of Luxembourg, Erasmus Mundus Joint Master in Cybersecurity, Dec 2023
- “Face Presentation Attack Detection”, EPFL CIS Network Seminar, May 2023
- “Some keys to understand biometrics”, Université de Lausanne, La semaine de la digitalisation, Feb 2023
- “Spoofing and Anti-Spoofing in Biometrics”, IEEE Biometrics Council seminar talk, Nov 2022
- “Spoofing and Anti-Spoofing in Biometrics”, (**Keynote**). Chinese Conference on Biometric Recognition, Oct 2022
- “Spoofing and Anti-Spoofing in Biometrics”, University of Haifa seminar, Mar 2022
- “Introduction to biometrics and anti-spoofing”, Université de Lausanne, 4e Rencontre entre la Science et le Droit dans le Numérique – Place à la biométrie !, Feb 2022
- “Spoofing and Anti-Spoofing in Biometrics”, IEEE Winter School on Security and Privacy in Biometrics, Jan 2017–2021
- “Spoofing and Anti-Spoofing in Biometrics”, First Israeli Biometrics Winter School, Feb 2020
- “Biometric Spoofing and Anti-Spoofing”, IEEE Summer School on Biometrics, Jun 2018
- “Biometric Spoofing and Anti-Spoofing” (**Keynote**), IEEE/IAPR International Workshop on Biometrics and Forensics, May 2019
- “Biometric Spoofing and Anti-Spoofing”, IEEE International Workshop on Information Forensics and Security, Dec 2017
- “Reproducible Research in Biometrics: moving to the BEAT” (**Keynote**), IEEE International Conference on Biometrics (ICB), June 2015

- “Spoofing and Anti-Spoofing in Biometrics: lessons learned from the TABULA RASA project”, IEEE International Conference on Biometrics (ICB), June 2015
- “Spoofing and Anti-Spoofing in Biometrics: lessons learned from the TABULA RASA project”, IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS), Sep 29 2013
- “On the importance of benchmarking in facial image analysis” (**Keynote**), IEEE ECCV International Workshop on Benchmarking Facial Image Analysis Technologies (BeFIT 2012), Firenze, Oct 2012
- “Torchvision: the machine-vision package of Torch”, ACM Multimedia, October 2010

4 Prizes and academic honors

- IEEE Fellow, 2025
- IAPR Fellow, 2024
- *European Biometrics Research Award 2023*, “Measuring Linkability of Protected Biometric Templates Using Maximal Leakage”, H. O. Shahreza and S. Marcel.
- IEEE senior member, 2019
- International Conference on Machine Learning (ICML) 2019 workshop on “Synthetic Realities: Deep Learning for Detecting AudioVisual Fakes” *Best Paper Award*, “Tampered Speaker Inconsistency Detection with Phonetically Aware Audio-visual Features”, P. Korshunov and S. Marcel.
- International Workshop on Biometrics and Forensics 2019 *IAPR Best Paper Award*, “Custom Silicon Face Masks: Vulnerability on Commercial Face Recognition Systems and Presentation Attack Detection”, R. Ramachandra, S. Venkatesh, K. Raja, S. Bhattacharjee, P. S. Wasnik, S. Marcel and C. Busch.
- *European Biometrics Research Award 2019*, “Learning How To Recognize Faces in Heterogeneous Environments”, T.d.F. Pereira and S. Marcel.
- IET 2015 *Biometrics Premium Best Paper Award*, “Session variability modelling for face authentication,” C. McCool, R. Wallace, M. McLaren, L. El Shafey, S. Marcel.
- *European Biometrics Research Award 2014*, IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 35, Issue 7, Pages 1788-1794, July 2013, , “A Scalable Formulation of Probabilistic Linear Discriminant Analysis: Applied to Face Recognition”, L. El-Shafey, C. McCool, R. Wallace, and S. Marcel.
- International Joint Conference on Biometrics (IJCB) 2014, *BTAS Best Paper Award*, “Audio-visual gender recognition in uncontrolled environment using variability modeling techniques”, L. El Shafey, E. Khoury, and S. Marcel.
- *European Biometrics Industry Award 2012*, IEEE Transactions on Information Forensics and Security, Vol. 7, Issue 1, Pages 241-254, February 2012, “A fast parts-based approach to speaker verification using boosted slice classifiers”, A. Roy, M. Magimai-Doss, and S. Marcel.
- International Conference on Pattern Recognition (ICPR) 2010, *Best Scientific Paper Award*, “Model and Score Adaptation for Biometric Systems: Coping with Device Interoperability and Changing Acquisition Conditions”, Norman Poh and al.
- European Conference on Computer Vision (ECCV) Workshop “Face Detection: where we are and what’s next ?” 2010, *Best Paper Award sponsored by Microsoft Research*, “Fast Bounding Box Estimation based Face Detection”, V.B. Subburaman and Sébastien Marcel.

5 Master and doctoral students

17 PhD students (supervised/co-supervised students marked with a ★/+):

1. Parsa Rahimi★ (EPFL EDEE PhD Student)	Sep 2022 –
2. Laurent Colbois★ (UNIL ESC PhD Student)	Jan 2021 – May 2025
3. Hatef Otroshi★ (EPFL EDEE PhD Student)	Mar 2020 – Sep 2024
4. Alex Unnervik★ (EPFL EDEE PhD Student)	Jan 2020 – Jul 2024
5. Amir Mohammadi★ (EPFL - Switzerland)	2020
6. Hannah Muckenhirn+ (EPFL - Switzerland)	2019
7. Tiago Peireira★ (EPFL - Switzerland)	2019
8. Matthias Vanoni★ (EPFL PhD Student)	Sep 2013 – Dec 2014
9. Ivana Chingovksa★ (EPFL - Switzerland)	2015
10. Laurent El Shafey★ (EPFL - Switzerland)	2014
11. Constantin Cosmin Atanasoaei★ (EPFL - Switzerland)	2012
12. Venkatesh Bala Subburaman★ (EPFL - Switzerland)	2012
13. Anindya Roy★ (EPFL - Switzerland)	2011
14. Guillaume Heusch★ (EPFL - Switzerland)	2009
15. Agnes Just★ (EPFL - Switzerland)	2006

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- 16. Yann Rodriguez* (EPFL - Switzerland) 2006
 - 17. Fabien Cardinaux* (EPFL - Switzerland) 2005

PhD jury member:

- Kevin Carta (Ecole des Mines de Saint Etienne - France) 2024
- Gabriel Bertocco (UNICAMP - Brazil) 2024
- Margaux Girod (UNIL- Switzerland) 2024
- Mohammadhossein Bahari (EPFL - Switzerland) 2024
- Thomas Thebaud (Université Le Man - France) 2022
- Behrooz Razeghi (UNIGE - Switzerland) 2022
- Shideh Rezaeifar (UNIGE - Switzerland) 2022
- Michel Saguy (UNIL - Switzerland) 2022
- Xiangnan Yin (EC Lyon - France) 2022
- Christophe Ecabert (EPFL - Switzerland) 2021
- Christian Galea (University of Malta) 2017
- Anil Yuce (EPFL - Switzerland) 2015
- Baptiste Chu (EC Lyon - France) 2015
- Abhijit Bendale (Colorado State University - USA) 2015
- Yong Wong (The University of Queensland - Australia) 2012
- Timo Ahonen (University of Oulu - Finland) 2009

Master students and Visitors (selection):

- Solène Fernandez (Master student – UNIL) 2025
- Laura Oldenburger (Master student – UNIL) 2025
- Marius Kernen (Master student – UNIL) 2024
- Matthieu Godi (Master student – UNIL) 2024
- Guillaume Syfrig (Master student – UNIL) 2023
- Lucas Braud (EPFL semester student) 2022
- Luis S. Luévano (PhD student – Tecnológico de Monterrey) 2022
- Emilie Kuhn (Master student – UNIL) 2022
- Alessandro Costa (Master student – UNIL) 2022
- Victor Bros (Master student – KTH & ENSIMAG) 2020
- Eklavya Sarkar (Master student – University of Bath) 2020
- Michela Pettinato (Master student – UNIL) 2020
- Niels Aeberhard (Master student – UNIL) 2020
- David Yambay (PhD student – Clarkson University) 2014
- Abhijit Bendale (PhD student – Colorado State University) 2014
- Rakesh Metha (PhD student – Tampere University of Technology) 2013
- Abhishek Dutta (PhD student – University Twente) 2013
- Tauseef Ali (PhD student – University Twente) 2013
- Jukka Komulainen (PhD student – University of Oulu) 2013
- M.I. Mandasari (PhD student – Radboud University Nijmegen) 2012
- T.d.F. Pereira (Master student – University of Campinas) 2012
- Dr Javier Galbally (Post-Doc student – Universidad Autónoma de Madrid) 2012
- Dr Mitch McLaren (Post-Doc student – Radboud University Nijmegen) 2011
- Fen Zheng (EPFL Master student) 2011
- Javier Galbally (PhD student – Universidad Autónoma de Madrid) 2009
- Simon Jacquier (EPFL Master student) 2008
- Anh-Thu Nguyen (EPFL Master student) 2007
- Jean Keomany (EPFL Master student) 2006
- Tiffany Sauquet (EURECOM Master student) 2005

6 Summary of teaching activities and major achievements

6.1 Ecole polytechnique fédérale de Lausanne (EPFL)

I was teaching the EPFL Doctoral program course on “Fundamentals in Statistical Pattern Recognition” (EE-612) every 2 years since Spring 2013 (Table 2). This course was designed to serve as a pre-requisite for more advanced courses on Machine Learning already taught at EPFL. This course presents the functioning details of fundamental supervised and unsupervised models, ranging from regression and classification to probability distribution modeling. The learning outcome for students is to get an in-depth understanding of the most fundamental algorithms in statistical pattern recognition (aka machine learning) as well as concrete tools (as Python source code). Labs play a central role (hands-on) in the course with guided programming labs in Python for a deep understanding of algorithms.

Overall the course was taken by 110+ students and they evaluated it to 5.4. In 2019 the course reached 29 students and became popular across various sections (EL, IN, MX, GM, SV, PH) as it provides basics in machine learning and deep learning.

The course received a very good feedback from the students as highlighted by some comments from IS-ACADEMIA listed below.

- *“It doesn’t happen often to attend a course whose teachers seem to actually care about teaching to their students.”*
- *“I was very impressed by the quality of the Professors. I have to say I never had such good explanations of the concepts approached in class.”*
- *“One of the best courses I have followed during my studies.”*
- *“Very well organized, good selection of content . . . So far the best PhD. course I attended.”*
- *“The course is very relevant, dynamic and well conducted.”*
- *“La partie théorique est très bien construite et m’a aidée à combler de nombreuses lacunes. Dr Sébastien Marcel est très bon pédagogue.”*
- *“I would sincerely like to thank the instructors of this course. The content was explained clearly throughout each lecture and the slides were absolutely neat. Thank you for all your efforts, besides the preparation and presentation of the lectures also for the homeworks and your rapid, clear responses to each of our questions, during class and via e-mail. I think this is precisely how a course should be.”*
- *“This course deals with state of the art techniques for pattern recognition. The presentation is particularly clear and precise.”*
- *“The classes were really well organized between theory and labs activities. This kind of organization helps to improve the understanding the intuitions and the algorithms involved in pattern recognition. In special, the lab classes were really helpful. The content was very well documented and this helps a lot for the understanding.”*
- *“The class structure is well defined. The teaching material is very well prepared and presented.”*
- *“There were multiple recaps/take aways, which tackled real-world challenges when implementing things in practice. This is really helpful rather than just being left with theory alone and facing significant issues when things in theory don’t work out in practice. A+ here too.”*
- *“This was a very valuable and well-organized course. The best feature is the close connection between theory and practice in the related labs.”*
- *“The hands-on character of this course was a plus for me. I really liked the labs and how they are structured.”*

6.2 University of Lausanne (UNIL)

Since 2018 I am teaching a new yearly Master course on “Biometrics” (Table 3) at the University of Lausanne (Faculty of Law, Criminal Justice and Public Administration) in the Master of Science (MSc) “Forensic Science, orientation Physical Identification”, the Master of Science (MSc) “Forensic Science, orientation Chemical Criminalistic” and the Master of Science (MSc) “Forensic Science, orientation Digital Investigation and Identification”. This course introduces to the analysis, modeling and interpretation of biometric data for biometric person recognition, forensic biometrics, cybersecurity and behavioral biometrics in man-machine communication.

6.3 UniDistance – Formation universitaire à distance (Switzerland)

I was involved in the Idiap/UniDistance Master in Artificial Intelligence (<https://master-ai.ch>) which was a full-time dual track education and training program combining lectures with working in a company. I coordinated the Curriculum of the program (14 modules) with the 10 Professors involved. I was also teaching 3 modules on “Open Science and Ethics”, “Fundamentals in Machine Learning” and “Biometrics” (Table 4).

From January 2017 to late 2019, I was also the scientific head of new Certificate of Advanced Studies (CAS) program on “Biometrics and Privacy” (<http://distanceuniversity.ch/cas-biometrics/>). This program was designed to help citizens, decision makers and authorities to better understand data protection, as well as biometric technologies and privacy issues. I was teaching one module of this CAS on “Biometrics: Introduction and Applications”.

Program	Name	Section	Year	Credits (ECTS)	Co-lecturers	Number of students	Major achievements
EDOC	Fundamentals in statistical pattern recognition (EE-612)	EDEE	2023	4	S. Marcel (40%), A. Anjos (50%), O. Canevet (labs 10%)	20	Revised course material: Decision Trees, t-SNE, Deep Learning. Novel pedagogical methodologies: guided programming labs in Python on JupyterHub with a pre-installed version of bob and pyTorch .
EDOC	Fundamentals in statistical pattern recognition (EE-612)	EDEE	2021	4	S. Marcel (60%), A. Anjos (40%), T.d.F. Pereira (labs), O. Canevet (labs)	24	The course was augmented with new material and new labs. Zoom was adopted for distance learning because of COVID pandemic. New course material: Decision Trees, t-SNE, Single Linkage, Deep Learning (e.g. Convolutional Neural Networks, Optimization). Novel pedagogical methodologies: guided programming labs in Python on JupyterHub with a pre-installed version of bob and pyTorch .
EDOC	Fundamentals in statistical pattern recognition (EE-612)	EDEE	2019	4	S. Marcel (70%), A. Anjos (30%), T.d.F. Pereira (labs)	25	Course material and labs were improved. Moodle was adopted.
EDOC	Fundamentals in statistical pattern recognition (EE-612)	EDEE	2017	4	S. Marcel (80%), A. Anjos (20%), T.d.F. Pereira (labs)	29	Course material and labs were improved.
EDOC	Fundamentals in statistical pattern recognition (EE-612)	EDEE	2015	4	S. Marcel (90%), A. Anjos (10%), T.d.F. Pereira (labs)	20	The course was augmented with new material and labs. New course material: Regularization, Support Vector Machines (SVM) and Hidden Markov Models (HMM).
EDOC	Fundamentals in statistical pattern recognition (EE-612)	EDEE	2013	4	S. Marcel (100%), A. Anjos (labs)	11	This course provides in-depth understanding of the most fundamental algorithms in statistical pattern recognition (aka machine learning) as well as concrete tools (as Python source code) to PhD students for their work. New course material: Introduction to Machine Learning (e.g. Overfitting and Capacity), Linear Regression, Logistic Regression, k-NN, Principal Component Analysis, Linear Discriminant Analysis, k-Means, Multi-Layer Perceptron (MLP) and Back-Propagation, Gaussian Mixture Models (GMM), Expectation-Maximization (EM). Novel pedagogical methodologies: guided programming labs in Python (inside a Virtual Box with a pre-installed version of the bob machine learning toolbox https://www.idiap.ch/software/bob/) for deep understanding of algorithms.

Table 2: Teaching activities at EPFL.

Program	Name	Section	Year	Credits (ECTS)	Co-lecturers	Number of students	Major achievements
MSc	Biometrics	Forensic Science	2024	3	S. Marcel (100%)	30	Course material improved.
MSc	Biometrics	Forensic Science	2023	3	S. Marcel (100%)	14	New online hands-on face "spoofing" lab introduced.
MSc	Biometrics	Forensic Science	2022	3	S. Marcel (100%)	13	New hands-on "face" and "speaker" analysis labs introduced in addition to the "spoofing" lab.
MSc	Biometrics	Forensic Science	2021	3	S. Marcel (100%)	21	New hands-on "spoofing" lab introduced – students were challenged to spoof face/fingerprint biometrics.
MSc	Biometrics	Forensic Science	2020	3	S. Marcel (100%)	42	Course material and labs moved to Moodle.
MSc	Biometrics	Forensic Science	2019	3	S. Marcel (100%)	32	Course material improved and labs adapted to a non-technical audience.
MSc	Biometrics	Forensic Science	2018	3	S. Marcel (100%)	12	Course material and labs created from scratch.

Table 3: Teaching activities at UNIL.

Program	Name	Section	Year	Credits (ECTS)	Co-lecturers	Number of students	Major achievements
MSc	Biometrics – MAI (A01)	Master AI	2022	4	S. Marcel (100%)	11	no changes – content and materials still adapted to the distance learning format.
MSc	Fundamentals in Machine Learning 1 – MAI (M06)	Master AI	2021	4	S. Marcel (25%), A. Anjos (25%), J. Henderson (25%), J.M. Odobez (25%)	11	no changes – content and materials still adapted to the distance learning format.
MSc	Fundamentals in Machine Learning 2 – MAI (M08)	Master AI	2021	4	S. Marcel (25%), A. Anjos (25%), J. Henderson (25%), J.M. Odobez (25%)	11	no changes – content and materials still adapted to the distance learning format.
MSc	Biometrics – MAI (A01)	Master AI	2021	4	S. Marcel (100%)	12	Course material improved and labs moved to JupyterHub.
MSc	Fundamentals in Machine Learning 1 – MAI (M06)	Master AI	2020	4	S. Marcel (25%), A. Anjos (25%), J. Henderson (25%), J.M. Odobez (25%)	12	Course material improved and labs moved to JupyterHub.
MSc	Fundamentals in Machine Learning 2 – MAI (M08)	Master AI	2020	4	S. Marcel (25%), A. Anjos (25%), J. Henderson (25%), J.M. Odobez (25%)	12	Course material improved and labs moved to JupyterHub.
MSc	Biometrics – MAI (A01)	Master AI	2020	4	S. Marcel (100%)	8	Course material and labs created from scratch for a distance learning model (moodle, screencast recordings, virtual classes).
MSc	Fundamentals in Machine Learning 1 – MAI (M06)	Master AI	2019	4	S. Marcel (25%), A. Anjos (25%), J. Henderson (25%), J.M. Odobez (25%)	8	Course material and labs created from scratch for a distance learning model (moodle, screencast recordings, virtual classes).
MSc	Fundamentals in Machine Learning 2 – MAI (M08)	Master AI	2019	4	S. Marcel (25%), A. Anjos (25%), J. Henderson (25%), J.M. Odobez (25%)	8	Course material and labs created from scratch for a distance learning model (moodle, screencast recordings, virtual classes).

Table 4: Teaching activities at UniDistance.

7 Summary of research activities and major achievements

7.1 Overview

I am currently leading and managing the Biometrics Security and Privacy group for nearly 15 years. Currently the group is composed of 14 non-permanent scientists (PhDs, PostDocs, Researchers).

As of today I secured more than 14'000'000 CHF of funding for Idiap (including overheads) from various research projects (SNF, CTI/Innosuisse, Hasler, Loterie Romande, EU, IARPA/DARPA, companies) forging my experience. I was the principal investigator of several Swiss National Science Foundation research projects funding PhD students on graphical models for face recognition (2004-2008), face detection (2007-2011), audio-visual person recognition (2007-2011), speaker recognition (2012-2014) and heterogeneous face recognition using Deep learning (2014-2017).

Between 2008 and 2016 I was the principal investigator and coordinator of 3 European research projects:

- MOBIO (2008-2010) was submitted originally in 2004 with the vision that mobile biometrics will become mainstream. It was finally accepted for funding in 2007 and was a first experience coordinating an international research project with 8 partners (including 2 companies). The Biometrics Security and Privacy gained 1 PostDoc and 2 PhD students. One of the main project outcome was a mobile biometrics research dataset collected over 5 countries in Europe and still used today. I was also given the Coordinator Award by Euresearch in 2010 for the MOBIO project.
- TABULA RASA (2010-2014) was a research project focused on the problem of biometric presentation attack detection (aka spoofing). It was the first large research project to study the problem for several biometric modalities (ie. face, iris, gait, EEG) requiring the efforts of 12 partners including one partner from China. The Biometrics Security and Privacy gained 2 PostDocs and 1 PhD student. TABULA RASA had a huge academic and industrial impact. It established the state-of-the-art, defined standards, created datasets and benchmarks still cited and used today. It led the way to international competitions, ISO/IEC standards, products, companies and created even more research funding opportunities. In 2013 the project has been identified by the European Commission as an EU success story. Since TABULA RASA the group is recognized for its expertise in biometric spoofing and anti-spoofing.
- BEAT (2012-2016) was a “Biometrics Evaluation and Testing” research project to propose a framework of standard operational evaluations for biometric technologies. It aimed at (1) developing an online and open platform to transparently and independently evaluate biometric systems against validated benchmarks, (2) designing protocols and tools for vulnerability analysis, and (3) developing standardization documents for certification. BEAT coordinated the efforts of 10 partners in Europe as well as 4 national agencies (FR, DE, ES, UK). The Biometrics Security and Privacy gained 2 PostDocs. BEAT created the BEAT platform that is now a more general computing e-infrastructure for Open Science proposing a solution for open access, scientific information sharing and re-use including data and source code while protecting privacy and confidentiality. This platform is used in several projects at Idiap including the recent H2020 AI4EU which is the European Union’s landmark Artificial Intelligence project. The BEAT project also contributed to standards and more particularly ISO/IEC 30107-1:2016 on “Biometric presentation attack detection” which itself was used by the FIDO Alliance to create its certification scheme of biometric products.

I was involved in numerous other research projects on face recognition, face anti-spoofing, speaker anti-spoofing, mobile biometrics, deep-fakes detection such as: Marie Curie ITN “Bayesian Biometrics for Forensics” (2010-2013), Hasler “CONTACTLESS Heartbeat detection for trustworthy FACE Biometrics” (2014-2015), H2020 “An Adaptive Trust-based e-assessment System for Learning” (2016-2018), Norway INKPLUSS “Secure Access Control over Wide Area Network” (2016-2019), US DARPA “Spotting Audio-Visual Inconsistencies” (2017-2018) or US IARPA “Biometric Authentication with Timeless Learner” (2016-2018).

7.2 Major scientific achievements

Pioneer in Biometric Presentation Attack Detection (aka Spoofing and Anti-Spoofing) We advanced the state-of-the-art in presentation attack detection to printed photo attacks (Visual and Near-Infrared spectra), photo/video replays and 3D masks in face recognition (Visual spectra) by proposing public benchmarks and organising the first International Competitions on the topic. We explored the use of Local Binary Patterns (LBP), spatio-temporal LBP, eye-blinking, motion patterns and image quality measures to detect such attacks. More recently, we also explored multi-spectral/channel imaging color (NIR, SWIR, Thermal, Depth) combined with Deep Neural Network Architectures. We also highlighted the vulnerability to presentation attacks with printed photos in finger-vein and palm-vein recognition and proposed a method based on motion magnification to detect these presentation attacks. Finally we advanced the state-of-the-art in presentation attack detection in speaker recognition. We published one of the first study to demonstrate the vulnerability of speaker recognition to presentation attacks performed with a replay of voice playback, a synthesized voice and a converted voice. We also organized the first competition on presentation attack detection in speaker recognition and proposed a cross-database evaluation of presentation attack detection methods from the literature.

This work was published in more than 5 book chapters, 20 International peer-reviewed scientific journals (including **IEEE Signal Processing Magazine** – impact factor 11.64, **IEEE Transactions on Image Processing** – impact factor 10.86 and **IEEE Transactions on Information Forensics and Security** – impact factor 6.2 and in more than 20 peer-reviewed conference papers – our first 5 most cited papers only in this area are totalling more than 2500 citations. More particularly this work initiated also a new book topic. We edited the first “Handbook of Biometrics Anti-Spoofing” (Edition 1 published by **Springer**) in 2014, we published the second

Edition in 2019 and we are also preparing a third edition as the combined chapter downloads for this book has reached recently 59K downloads.

Early stage contribution in Brainwave Biometrics We investigated the use of brain activity for person recognition. It has been shown in previous studies that the brain-wave pattern of every individual is unique and that the electroencephalogram (EEG) can be used for biometric identification. EEG-based biometry was an emerging research topic and we believed that it may open new research directions and applications in the future. However, very little work has been done in this area and was focusing mainly on person identification but not on person authentication. We proposed the use of a statistical framework based on Gaussian Mixture Models and Maximum A Posteriori model adaptation, successfully applied to speaker and face authentication, which can deal with only one training session. We perform intensive experimental simulations using several strict train/test protocols to show the potential of our method. We also show that there are some mental tasks that are more appropriate for person authentication than others.

This work was published in only 1 International peer-reviewed scientific journal, namely **IEEE Transactions on Pattern Analysis and Machine Intelligence** (with an impact factor of 16.39) but to-date received more than 581 citations.

Distribution modeling and session variability modeling for part-based face recognition We examined session variability modelling for face recognition using GMMs. It is leveraging on prior work on distribution modelling for part-based face recognition. Session variability modelling aims to explicitly model and suppress detrimental within-class (inter-session) variation. We examined two techniques to do this, inter-session variability modelling (ISV) and joint factor analysis (JFA), which were initially developed for speaker recognition. We also developed a scalable derivation of Probabilistic Linear Discriminant Analysis (PLDA) which is theoretically equivalent to the previous non-scalable solution and so obviates the need for a variational approximation. PLDA is a probabilistic model that has been shown to provide state-of-the-art performance for both face and speaker recognition. However, it has one major drawback, at training time estimating the latent variables requires the inversion and storage of a matrix whose size grows quadratically with the number of samples for the identity (class). The main advantage of the proposed approach is a gain in performance when using more training samples per identity (class), which is made possible by the proposed scalable formulation of PLDA.

This work was published in 4 International peer-reviewed scientific journals (including **IEEE Transactions on Pattern Analysis and Machine Intelligence**) and in 4 peer-reviewed conference papers totalling nearly 200 citations.

8 Funding record

Total secured funding: > 14'000'000 CHF

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- INTERART (Loterie Romande) – “Identification des portraits historiques par technologies de reconnaissance faciale hétérogène” (87'000 CHF) – joint project between the Idiap Research Institute, Musée d’Art et d’Histoire de Genève (MAH), Université d’Oxford and École des sciences criminelles (UNIL ESC) 2025-2026
- ORION (EU HORIZON) – “Optimized Risk-based Intelligence-driven Operations for Next-generation Secure, Reliable and Privacy-preserving Border Management” (600'000 CHF) 2025-2028
- CERTAIN (EU HORIZON) – “Certification for Ethical and Regulatory Transparency in Artificial Intelligence” (1'200'000 CHF) 2025-2027
- CarMen (EU HORIZON) – “CarMen” (1'000'000 CHF) 2024-2027
- PopEye (EU HORIZON) – “robust Privacy-preserving biometric technologies for Passengers’ identification and verification at EU external borders maximising the accuracy, reliability and throughput of the recognition process” (800'000 CHF) 2024-2027
- ROSALIND* (CH InnoSwiss) – “Robust anti-fraud algorithms against malicious AI-generated face images and travel documents” (1'000'000 CHF) 2024-2025
- SENTINEL (CH InnoSwiss) – “Securing Age Estimation and Digital IDs against Presentation and Injection Threats” (300'000 CHF) 2023-2025
- GENPAI* (CITeR) – “On the robustness of face PAD to generative AI-based PAI” (50'000 CHF) 2024
- MBR4DR* (Stellantis) – “Multi-modal biometric recognition for personalization” 2022-2023
- SOTERIA (EU H2020) – “user-friendly digital secured personal data and privacy platform” (800'000 CHF) 2021-2024
- Meta-Spoof* (Meta Research Award) – “Trustworthy AR/VR” (75'000 USD) 2022-2023
- GRAIL (US IARPA BRIAR) – “Generative Range and Altitude Identity Learning” (800'000 CHF) 2022-2024
- LEGAL2* (CITeR) – “Large scale synthetic datasets for face recognition” (100'000 CHF) 2023
- SAFER* (CH Hasler) – “responsible fair Face Recognition” (500'000 CHF) 2022-2025
- HARDENING* (CH InnoSwiss) – “Heterogeneous face recognition for unified identity management” (200'000 CHF) 2021-2022
- LEGAL* (CITeR) – “Large scale synthetic datasets for face recognition” (100'000 CHF) 2022
- PolyProtect* (CITeR) – “Preserving the privacy of face embeddings in modern face recognition systems” (100'000 CHF) 2021
- MARGIN (CH InnoSwiss) – “Multi-modal federated age verification” (200'000 CHF) 2020-2021
- CANDY* (CH InnoSwiss) – “Contactless finger vein recognition and presentation attack Detection on-the-fly” (200'000 CHF) 2020-2021

• FairFace* (CITeR) – “Fairness of Face Recognition against Social Covariates” (100'000 CHF)	2020
• FRBB* (Industrial) – “Face Recognition Bias Benchmarking” (300'000 CHF)	2019-2020
• HIOV* (Industrial) – “Face Anti-Spoofing in Autonomous Vehicules” (460'000 CHF)	2019-2020
• VERIFAKE* (CH Hasler) – “Vulnerability assessment and detection of Deepfake videos” (50'000 CHF)	2018-2020
• BIOWAVE2 (CH InnoSwiss) – “BIometric Watch Activated by VEins” (200'000 CHF)	2018-2020
• AI4EU (EU H2020) – “European AI-on-demand platform”	2019-2021
• ALLIES (CHIST-ERA) – “Autonomous Lifelong learnIng intelLigent Systems” (500'000 CHF)	2018-2020
• BATL (US IARPA ODIN) – “Biometric Authentication with Timeless Learner” (800'000 CHF)	2016-2018
• SAVI (US DARPA MediFor) – “Spotting Audio-Visual Inconsistencies” (380'000 CHF)	2017-2018
• Swiss Center for Biometrics Research and Testing* (Swiss Valais) – (500'000 CHF)	2016
• FARGO* (CH CTI) – “Convenient and Secure 3D Face Recognition based on RGB-D Cameras” (150'000 CHF)	2016-2017
• BIOWAVE (CH CTI) – “BIometric Watch Activated by VEins” (200'000 CHF)	2016-2017
• 3DFingerVein (CH CTI) – “3D FingerVein Biometrics” (200'000 CHF)	2016-2017
• ODESSA (ANR/SNF) – “Online Diarization Enhanced by recent Speaker identification and Sequential learning Approaches” (350'000 CHF)	2016-2019
• UniTS (CH SNSF) – “Unified Speech Processing Framework for Trustworthy Speaker Recognition” (150'000 CHF)	2015-2018
• SWAN (NO INKPLUSS) – “Secure Access Control over Wide Area Network” (358'208 CHF)	2016-2019
• TeSLA (EU H2020) – “An Adaptive Trust-based e-assessment System for Learning” (642'974 CHF)	2016-2018
• Google* – “Mobile Anti-Spoofing” (\$ 235'000)	2015-2016
• Google ATAP* – “Mobile Biometrics” (\$ 100'000)	2015
• HFACE* (CH SNSF) – “Heterogeneous Face Recognition” (150'000 CHF)	2014-2017
• COHFACE* (CH Hasler) – “CONTACTless Heartbeat detection for trustworthy FACE Biometrics” (50'000 CHF)	2014-2015
• Swiss Center for Biometrics Research and Testing * (Swiss Valais) – (300'000 CHF)	2014
• EMMA1* (Industrial) – “Emotion Marker Analysis” (€ 236'000)	2014-2015
• LOBI* (CH SNSF) – “Low Complexity Binary Features for Robust-to-Noise Speaker Recognition” (235'000 CHF)	2012-2014
• BEAT (EU FP7)* – SECURITY “Biometrics Evaluation and Testing” (€ 959'000)	2012-2016
• TABULA RASA* (EU FP7) – ICT “Trusted Biometrics under Spoofing Attacks” (€ 982'000)	2010-2014
• CONTEXT* (CH Hasler) – “Context Modeling for Object Detection” (50'000 CHF)	2011
• BBfor2 (EU FP7) – Marie Curie ITN “Bayesian Biometrics for Forensics” (€ 321'000)	2010-2013
• MOBIO* (EU FP7) – ICT “Mobile Biometry” (€ 725'000)	2008-2010
• REPLAY* (CH CTI) – “Face authentication robust to replay attacks” (145'000 CHF)	2010
• MULTI 1110* (CH SNSF) – “Joint Bi-Modal Person Authentication” (150'000 CHF)	2007-2011
• MULTI 1105* (CH SNSF) – “Multi-view Face Detection” (150'000 CHF)	2007-2011
• GMface* (CH SNSF) – “Graphical Models for face authentication” (150'000 CHF)	2004-2008
• BioSign* (France Telecom) – “Biometric Signature” (€ 100'000)	2004
• GHOST* (France Telecom) – “Gesturing Hand recOgition baSed on user Tracking” (€ 126'000)	2001-2005

9 Collaborations with other groups

9.1 Academic

I engaged many collaborations with academia. Besides students hosting and supervision (Master level, PhD level) or serving as PhD jury member (UNIL, EPFL, EC Lyon, Colorado State University, The University of Queensland, University of Oulu), I mostly undertook joint research activities in the context of bi-lateral or multi-lateral funded projects:

- University of Surrey, University of Manchester, Brno University of Technology, University of Avignon, Universidad Autonoma de Madrid, Chinese Academy of Science, University of Oulu, EURECOM, University of Southampton, Università Degli Studi di Cagliari, Politecnico di Torino, Universiteit Twente, Katholieke Universiteit Leuven, EPFL or Chalmers University of Technology (to mention a few) in the context of multiple European projects in biometrics (from FP7 to Horizon).
- Norwegian University of Science and Technology and Hochschule Darmstadt in the context of a biometrics project funded by the Research Council of Norway.
- University of Southern California’s Viterbi School of Engineering and Northwestern University in the context of a research projects funded by the US IARPA under the ODIN and BRIAR programs.
- SRI International and University of Amsterdam in the context of a research project funded by the US DARPA under the Media Forensics (MediFor) program.

- Michigan State University in the context of a research project funded by the US Center for Identification Technology Research.
- Universität Zürich in the context of a face recognition project funded by the Hasler foundation under the Responsible AI program.

9.2 Industrial

I always worked closely with companies on applied or more prospective research projects such as: CTI “Face authentication robust to replay attacks” with KeyLemon SA (2010), **Google ATAP** “Mobile Biometrics” with Google (2015), **Google** “Mobile Anti-Spoofing” with Google (2015-2016), CTI “3D FingerVein Biometrics” with Global ID SA (2016-2017), CTI “BIometric Watch Activated by VEins” with Biowatch SA (2016-2017), CTI “Convenient and Secure 3D Face Recognition based on RGB-D Cameras” with KeyLemon SA (2016-2017), InnoSuisse “Heterogeneous fAce Recognition for unifieD idENtity maNaGement” with Facedapter SA (2021-2023), InnoSuisse “Contact-less finger vein recognition and presentation attack detection on-the-fly” with GlobalID (2020-2022), InnoSuisse “Multi-modal federated age verification” with Privately (2021-2022), “Multimodal Biometric Platform for Driver Personalization” with the Stellantis group (2022-2023), as well confidential projects with companies such as **Apple**, **Huawei** or **SICPA**.

Additionally in 2014 and 2016 I was supported by the State of Valais and the city of Martigny to establish a “Swiss Center for Biometrics Research and Testing” at Idiap with the aim to create a collaborative research center and to propose testing services in the domain of biometrics. As of today this center joined the US Center for Identification Technology Research (CITeR) and was the third FIDO biometrics certification laboratory worldwide.

10 Innovation, technology transfer, patents

10.1 Open Source

- **Torchvision**: “Torchvision the machine-vision package of torch”, S. Marcel and Y. Rodriguez. Proceedings of the 18th ACM International Conference on MultiMedia (2010), <https://doi.org/10.1145/1873951.1874254>.

Torchvision is the open source machine vision package for Torch (version 3). Torch3 is a machine learning library providing a series of the state-of-the-art algorithms such as Neural Networks, Support Vector Machines, Gaussian Mixture Models, Hidden Markov Models and many others. Torchvision provides additional functionalities to manipulate and process images with standard image processing algorithms. Hence, the resulting images can be used directly with the Torch machine learning algorithms as Torchvision is fully integrated with Torch. Both Torch and Torchvision are written in C++ language and are publicly available under the Free-BSD License.

- **Bob** (<https://www.idiap.ch/software/bob>): “Bob: a free signal processing and machine learning toolbox for researchers”, A. Anjos, L. El Shafey, R. Wallace, M. Günther, C. McCool, S. Marcel. Proceedings of the 20th ACM International Conference on MultiMedia (2012), <https://dl.acm.org/doi/abs/10.1145/2393347.2396517>.

Bob is a free signal processing and machine learning toolbox originally developed by the Biometrics group at Idiap Research Institute, Switzerland. The toolbox is designed to meet the needs of researchers by reducing development time and efficiently processing data. Firstly, Bob provides a researcher-friendly Python environment for rapid development. Secondly, efficient processing of large amounts of multimedia data is provided by fast C++ implementations of identified bottlenecks. The Python environment is integrated seamlessly with the C++ library, which ensures the library is easy to use and extensible. Thirdly, Bob supports reproducible research through its integrated experimental protocols for several databases. Finally, a strong emphasis is placed on code clarity, documentation, and thorough unit testing. Bob is thus an attractive resource for researchers due to this unique combination of ease of use, efficiency, extensibility and transparency. Bob is an open-source library and an ongoing community effort.

- **BEAT** (<https://www.idiap.ch/software/beat/>): “BEAT: An Open-Science Web Platform”, A. Anjos, L. El Shafey and S. Marcel. International Conference on Machine Learning (2017), <https://arxiv.org/abs/1704.02319>.

With the increased interest in computational sciences, machine learning (ML), pattern recognition (PR) and big data, governmental agencies, academia and manufacturers are overwhelmed by the constant influx of new algorithms and techniques promising improved performance, generalization and robustness. Sadly, result reproducibility is often an overlooked feature accompanying original research publications, competitions and benchmark evaluations. The main reasons behind such a gap arise from natural complications in research and development in this area: the distribution of data may be a sensitive issue; software frameworks are difficult to install and maintain; Test protocols may involve a potentially large set of intricate steps which are difficult to handle. Given the raising complexity of research challenges and the constant increase in data volume, the conditions for achieving reproducible research in the domain are also increasingly difficult to meet. To bridge this gap, we built an open platform for research in computational sciences related to pattern recognition and machine learning, to help on the development, reproducibility and certification of results obtained in the field. By making use of such a system, academic, governmental or industrial organizations enable users to easily and socially develop processing toolchains, re-use data, algorithms, workflows and compare results from distinct algorithms and/or parameterizations with minimal effort. This article

presents such a platform and discusses some of its key features, uses and limitations. We overview a currently operational prototype and provide design insights.

The BEAT platform is a computing e-infrastructure for Open Science proposing a solution for open access, scientific information sharing and re-use including data and source code while protecting privacy and confidentiality. It is developed by the Biometrics Security and Privacy Group, the Biosignal Processing Group, and the Research and Development Engineers at Idiap, in Switzerland. BEAT is primarily developed through Gitlab. Follow the links below to get started.

10.2 Technology Transfer

- **KeyLemon** (spin-off from the Biometrics Security and Privacy Group): transfer and licensing of a face recognition technology, acquired by Ams AG in 2018 (<https://www.venturelab.swiss/KeyLemon>).
- **BioWatch** (spin-off from the Biometrics Security and Privacy Group): transfer and licensing of a wrist vein recognition technology.
- **Global ID**: transfer and licensing of fingervein recognition technology.
- **Privately**: transfer and licensing of an age estimation technology.
- **Google, Apple, Huawei, SICPA, Stellantis**: transfer and licensing of know-how or technologies in the area of biometrics security (restricted or confidential).

10.3 Patents

- US 2017/0171210A1 – S. Marcel, A. Anjos, P. Abbet, "Method and internet-connected server for reviewing a computer-executable experiment" (<https://patents.google.com/patent/US20170171210A1/en>).
- US 2019/0180040A1 – A. Anjos, S. Marcel, "A data-network connected server, a device, a platform and a method for conducting computer-executable experiments" (<https://patents.google.com/patent/US20190180040A1/en>).
- WO 2019/150254 A1 – L. Sonna Momo, L. Cerqueira Torres, S. Marcel, A. Anjos, M. Liebling, A. Shajkofci, S. Amos, A. Woeffray, A. Sierro, "Method and device for biometric vascular recognition and/or identification".
- EP 2020/3719679 A1 – V. Krivokuca Hahn, S. Marcel, "A method for protecting biometric templates, and a system and method for verifying a speaker's identity".
- WO 2016/023582 A1 – S. Marcel, "A method of detecting a falsified presentation to a vascular recognition system".

11 Other professional activities

- **Executive Committee**: Vice-President Conferences, IEEE Biometrics Council, 2017–2019
- **Editorial Boards**:
 - **Associate Editor, IEEE Transactions on Biometrics, Behavior, and Identity Science** 2019–2022
 - **Co-Editor, Springer Handbook of Biometric Anti-Spoofing (Ed 3)** 2022
 - **Co-Editor, Springer Handbook of Vascular Biometrics (Ed 1)** 2019
 - **Co-Editor, Springer Handbook of Biometric Anti-Spoofing (Ed 2)** 2019
 - **Associate Editor, IEEE Signal Processing Letters** 2017–2018
 - **Associate Editor, IEEE Transactions on Information Forensics and Security** 2013–2016
 - **Guest Editor, IEEE Signal Processing Magazine Special Issue on Biometric Security and Privacy** 2015
 - **Guest Editor, IEEE Transactions on Information Forensics and Security Special Issue on Biometric Spoofing and Countermeasures** 2014
 - **Co-Editor, Springer Handbook of Biometric Anti-Spoofing (Ed 1)** 2014
- **General Chair**: International Joint Conference on Biometrics (IJCB) 2024
- **Competition Chair**: International Conference on Biometrics (ICB), Face and Gesture Conference (FG)
- **Doctoral Consortium Chair**: IEEE International Conference on Biometrics Theory, Applications, and Systems (BTAS)
- **Reviewer**: International Conference on Image Processing (ICIP), International Conference on Pattern Recognition (ICPR), International Conference on Computer Vision and Pattern Recognition (CVPR), European Conference on Computer Vision (ECCV), International Joint Conference on Biometrics (IJCB), International Conference on Biometrics (ICB)

12 Administrative activities

- Member of the Research Committee since 2008
Composed of the director, professors, MERs and all other Idiap lead scientists, as well as members of the Administrative college. Its main mission is to ensure the optimal flow of information between management, scientific staff and administration.
- Member of the Admin College 2018–2024
Composed of the deputy director, financial manager, head of system & infrastructure group, head of the research & development engineers group, members of the program management group, head of marketing & communications, head of the legal service, technology transfer officer, two researchers representatives. Its main mission is to cope with day-to-day administrative and service affairs.
- Member of the Scientific College since 2020
Composed of 4 senior research scientists, with or without academic titles, appointed by the Foundation council. Its main mission is to assist the management and to collectively steer the scientific activities of the institute, maximising its quality and impact at the national and international level.
- President (and co-investigator) of the Idiap Data Research and Ethics Committee (DREC) Aug 2018–Sep 2020
Composed of a minimum of 4 members (2 administrative members, 2 lead scientists). Its main mission is to provide an informal recommendation from an ethical point of view. The committee becomes involved when opinion from Idiap is required for a project on an institutional level.
- President of the Idiap Search Committee (recruitment of new researchers) 2019, 2020

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April 12, 2026

Peer Reviewed Journal Articles

- [12] Ketan Kotwal and Sébastien Marcel. “Review of Demographic Fairness in Face Recognition”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2025).
- [16] Hatef Otroshi Shahreza, Anjith George, Rahimi Parsa, Alexander Unnervik, and Sébastien Marcel. “Second FRCSyn-onGoing: Winning Solutions and Post-Challenge Analysis to Improve Face Recognition with Synthetic Data”. In: *Information Fusion* (2025).
- [18] Hatef Otroshi Shahreza and Sébastien Marcel. “Foundation Models and Biometrics: A Survey and Outlook”. In: *IEEE Transactions on Information Forensics and Security* (2025). DOI: [10.1109/TIFS.2025.3602233](https://doi.org/10.1109/TIFS.2025.3602233). URL: <https://ieeexplore.ieee.org/document/11137396>.
- [27] Anjith George, Christophe Ecabert, Hatef Otroshi Shahreza, Ketan Kotwal, and Sébastien Marcel. “EdgeFace: Efficient Face Recognition Model for Edge Devices”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2024). DOI: [10.1109/TBIOM.2024.3352164](https://doi.org/10.1109/TBIOM.2024.3352164).
- [28] Anjith George and Sébastien Marcel. “From Modalities to Styles: Rethinking the Domain Gap in Heterogeneous Face Recognition”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2024). DOI: [10.1109/TBIOM.2024.3365350](https://doi.org/10.1109/TBIOM.2024.3365350).
- [37] Hatef Otroshi Shahreza, Anjith George, and Sébastien Marcel. “Knowledge Distillation for Face Recognition using Synthetic Data with Dynamic Latent Sampling”. In: *IEEE Access* (2024).
- [38] Hatef Otroshi Shahreza, Vedrana Krivokuca, and Sébastien Marcel. “Vulnerability of State-of-the-Art Face Recognition Models to Template Inversion Attack”. In: *IEEE Transactions on Information Forensics and Security* (2024). DOI: [10.1109/TIFS.2024.3381820](https://doi.org/10.1109/TIFS.2024.3381820).
- [41] Hatef Otroshi Shahreza and Sébastien Marcel. “Template Inversion Attack Using Synthetic Face Images Against Real Face Recognition Systems”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2024). DOI: [10.1109/TBIOM.2024.3391759](https://doi.org/10.1109/TBIOM.2024.3391759).
- [43] Hatef Otroshi Shahreza, Yanina Shkel, and Sébastien Marcel. “On Measuring Linkability of Multiple Protected Biometric Templates using Maximal Leakage”. In: *IEEE Access* (2024). DOI: [10.1109/ACCESS.2024.3433536](https://doi.org/10.1109/ACCESS.2024.3433536).
- [46] Behrooz Razeghi, Marzieh Gheisari, Amir Atashin, Dimche Kostadinov, Sébastien Marcel, Deniz Gunduz, and Slava Voloshynovskiy. “Group Membership Verification via Nonlinear Sparsifying Transform Learning”. In: *IEEE Access* (2024). DOI: [10.1109/ACCESS.2024.3417301](https://doi.org/10.1109/ACCESS.2024.3417301).
- [53] Mathias Ibsen, Christian Rathgeb, Fabian Brechtel, Ruben Klepp, Katrin Pöppelmann, Anjith George, Sébastien Marcel, and Christoph Busch. “Attacking Face Recognition With T-Shirts: Database, Vulnerability Assessment, and Detection”. In: *IEEE Access* (2023). DOI: [10.1109/ACCESS.2023.3282780](https://doi.org/10.1109/ACCESS.2023.3282780).
- [61] Hatef Otroshi Shahreza and Sébastien Marcel. “Comprehensive Vulnerability Evaluation of Face Recognition Systems to Template Inversion Attacks Via 3D Face Reconstruction”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2023). DOI: [10.1109/TPAMI.2023.3312123](https://doi.org/10.1109/TPAMI.2023.3312123).
- [63] Hatef Otroshi Shahreza, Yanina Shkel, and Sébastien Marcel. “Measuring Linkability of Protected Biometric Templates Using Maximal Leakage”. In: *IEEE Transactions on Information Forensics and Security* (2023). DOI: [10.1109/TIFS.2023.3266170](https://doi.org/10.1109/TIFS.2023.3266170).
- [64] Hatef Otroshi Shahreza, Alexandre Veuthey, and Sébastien Marcel. “Toward High-Resolution Face Image Generation From Coded Aperture Camera”. In: *IEEE Sensors Letters* (2023). DOI: [10.1109/LSENS.2023.3315248](https://doi.org/10.1109/LSENS.2023.3315248).

-
- [67] Anjith George, Amir Mohammadi, and Sébastien Marcel. “Prepended Domain Transformer: Heterogeneous Face Recognition without Bells and Whistles”. In: *IEEE Transactions on Information Forensics and Security* (2022).
- [70] Ketan Kotwal, Sushil Bhattacharjee, Philip Abbet, Zohreh Mostaani, Huang Wei, Xu Wenkang, Zhao Yaxi, and Sébastien Marcel. “Domain-Specific Adaptation of CNN for Detecting Face Presentation Attacks in NIR”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2022).
- [73] Vedrana Krivokuca and Sébastien Marcel. “Biometric Template Protection for Neural-Network-based Face Recognition Systems: A Survey of Methods and Evaluation Techniques”. In: *IEEE Transactions on Information Forensics and Security* (2022). URL: <https://arxiv.org/abs/2110.05044v4>.
- [74] Vedrana Krivokuca and Sébastien Marcel. “Towards Protecting Face Embeddings in Mobile Face Verification Scenarios”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* 4.1 (2022), pp. 117–134. ISSN: 2637-6407. DOI: [10.1109/TBIOM.2022.3140472](https://doi.org/10.1109/TBIOM.2022.3140472).
- [80] Meysam Shamsi, Anthony Larcher, Loïc Barrault, Sylvain Meignier, Yevhenii Prokopalo, Marie Tahon, Ambuj Mehrish, Simon Petitrenaud, Olivier Galibert, Samuel Gaist, André Anjos, Sébastien Marcel, and Marta Costa-Jussà. “Towards Lifelong Human Assisted Speaker Diarization”. In: *Computer Speech and Language* (2022). DOI: [10.1016/j.csl.2022.101437](https://doi.org/10.1016/j.csl.2022.101437). URL: <https://www.sciencedirect.com/science/article/pii/S0885230822000638>.
- [84] Tiago de Freitas Pereira and Sébastien Marcel. “Fairness in Biometrics: a figure of merit to assess biometric verification systems”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2021). URL: <http://publications.idiap.ch/index.php/publications/show/4463>.
- [88] Anjith George and Sébastien Marcel. “Scalability Study on Multi-channel Biometric Face Presentation Attack Detection”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2021). (under review).
- [90] Pavel Korshunov and Sébastien Marcel. “Improving Generalization of Deepfake Detection with Data Farming and Few-Shot Learning”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2021). URL: <http://publications.idiap.ch/index.php/publications/show/4754>.
- [94] Hatef Otroushi and Sébastien Marcel. “Towards Protecting and Enhancing Finger Vein Recognition methods via Biohashing and Deep Neural Networks”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2021). DOI: [10.1109/TBIOM.2021.3076444](https://doi.org/10.1109/TBIOM.2021.3076444). URL: <https://publications.idiap.ch/index.php/publications/show/4545>.
- [96] Anjith George and Sébastien Marcel. “Learning One Class Representations for Face Presentation Attack Detection using Multi-channel Convolutional Neural Networks”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2020). DOI: [10.1109/TIFS.2020.3013214](https://doi.org/10.1109/TIFS.2020.3013214). URL: <https://publications.idiap.ch/index.php/publications/show/4347>.
- [97] Guillaume Heusch, Anjith George, David Geissenbuhler, Zohreh Mostaani, and Sébastien Marcel. “Deep Models and Short-wave Infrared Information to Detect Face Presentation Attacks”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2020). DOI: [10.1109/TBIOM.2020.3010312](https://doi.org/10.1109/TBIOM.2020.3010312). URL: <https://publications.idiap.ch/index.php/publications/show/4325>.
- [106] Tiago de Freitas Pereira, André Anjos, and Sébastien Marcel. “Heterogeneous Face Recognition Using Domain Specific Units”. In: *IEEE Transactions on Information Forensics and Security* (Feb. 2019), p. 13. DOI: [10.1109/TIFS.2018.2885284](https://doi.org/10.1109/TIFS.2018.2885284).
- [108] Anjith George, Zohreh Mostaani, David Geissenbuhler, Olegs Nikisins, André Anjos, and Sébastien Marcel. “Biometric Face Presentation Attack Detection with Multi-Channel Convolutional Neural Network”. In: *IEEE Transactions on Information Forensics and Security* (May 2019), p. 13. DOI: [10.1109/TIFS.2019.2916652](https://doi.org/10.1109/TIFS.2019.2916652).
- [109] Guillaume Heusch, Tiago de Freitas Pereira, and Sébastien Marcel. “A Comprehensive Experimental and Reproducible Study on Selfie Biometrics in Multistream and Heterogeneous Settings”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2019). DOI: [10.1109/TBIOM.2019.2927692](https://doi.org/10.1109/TBIOM.2019.2927692). URL: <https://ieeexplore.ieee.org/document/8759986>.
- [114] Ketan Kotwal, Sushil Bhattacharjee, and Sébastien Marcel. “Multispectral Deep Embeddings As a Countermeasure To Custom Silicone Mask Presentation Attacks”. In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* (2019). (to appear).
- [115] Ketan Kotwal, Zohreh Mostaani, and Sébastien Marcel. “Detection of Age-Induced Makeup Attacks on Face Recognition Systems Using Multi-Layer Deep Features”. In: *IEEE Transactions on Biometrics, Behavior and Identity Science* (2019), p. 11. DOI: [10.1109/TBIOM.2019.2946175](https://doi.org/10.1109/TBIOM.2019.2946175). URL: <https://ieeexplore.ieee.org/document/8863925>.
- [129] Z. Akhtar, A. Hadid, M. Nixon, M. Tistarelli, J-L. Dugelay, and S. Marcel. “Biometrics: In Search of Identity and Security (Q & A)”. In: *IEEE MultiMedia* PP.99 (2017). DOI: [10.1109/MMUL.2017.265090754](https://doi.org/10.1109/MMUL.2017.265090754).
- [136] P. Korshunov and S. Marcel. “Impact of score fusion on voice biometrics and presentation attack detection in cross-database evaluations”. In: *IEEE Journal of Selected Topics in Signal Processing* 11.4 (2017), pp. 695–705. DOI: [10.1109/JSTSP.2017.2692389](https://doi.org/10.1109/JSTSP.2017.2692389).
- [138] A. Mohammadi, S. Bhattacharjee, and S. Marcel. “Deeply Vulnerable – a study of the robustness of face recognition to presentation attacks”. In: *IET Biometrics* (2017), pp. 1–13. DOI: [10.1049/iet-bmt.2017.0079](https://doi.org/10.1049/iet-bmt.2017.0079).

- [139] H. Muckenhirn, P. Korshunov, M. Magimai-Doss, and S. Marcel. “Long-Term Spectral Statistics for Voice Presentation Attack Detection”. In: *IEEE/ACM Transactions on Audio, Speech and Language Processing* 25.11 (2017), pp. 2098–2111. DOI: [10.1109/TASLP.2017.2743340](https://doi.org/10.1109/TASLP.2017.2743340).
- [149] A. Morales, J. Fierrez, R. Tolosana, J. Ortega-Garcia, J. Galbally, M. Gomez-Barrero, A. Anjos, and S. Marcel. “Keystroke Biometrics Ongoing Competition”. In: *IEEE Access* PP.99 (2016). DOI: [10.1109/ACCESS.2016.2626718](https://doi.org/10.1109/ACCESS.2016.2626718).
- [153] A. Dutta, M. Günther, L. El-Shafey, S. Marcel, R. Veldhuis, and L. Spreeuwens. “Impact of Eye Detection Error on Face Recognition Performance”. In: *IET Biometrics* (Jan. 2015). (in press), p. 14. DOI: [iet-bmt.2014.0037](https://doi.org/10.1049/iet-bmt.2014.0037).
- [156] N. Evans, S. Li, S. Marcel, and A. Ross. “Guest editorial: Special issue on biometric spoofing and countermeasures”. In: *IEEE Transactions on Information Forensics and Security* 10.4 (2015), pp. 699–702. DOI: [10.1109/TIFS.2015.2406111](https://doi.org/10.1109/TIFS.2015.2406111).
- [157] A. Hadid, N. Evans, S. Marcel, and J. Fierrez. “Biometrics systems under spoofing attack: an evaluation methodology and lessons learned”. In: *IEEE Signal Processing Magazine* 32.5 (2015), pp. 20–30.
- [161] A. Sizov, E. Khoury, T. Kinnunen, Z. Wu, and S. Marcel. “Joint Speaker Verification and Anti-Spoofing in the i-Vector Space”. In: *IEEE Transactions on Information Forensics and Security* 10.4 (2015), pp. 821–832. DOI: [10.1109/TIFS.2015.2407362](https://doi.org/10.1109/TIFS.2015.2407362).
- [166] I. Chingovska, A. Anjos, and S. Marcel. “Biometrics Evaluation under Spoofing Attacks”. In: *IEEE Transactions on Information Forensics and Security* 9.12 (2014), pp. 2264–2276. DOI: [10.1109/TIFS.2014.2349158](https://doi.org/10.1109/TIFS.2014.2349158).
- [169] N. Erdogmus and S. Marcel. “Spoofing Face Recognition with 3D Masks”. In: *IEEE Transactions on Information Forensics and Security* 9.7 (2014), pp. 1084–1097. DOI: [10.1109/TIFS.2014.2322255](https://doi.org/10.1109/TIFS.2014.2322255).
- [171] J. Galbally, S. Marcel, and J. Fierrez. “Biometric Antispoofing Methods: A Survey in Face Recognition”. In: *IEEE Access* 2 (2014), pp. 1530–1552.
- [172] J. Galbally, S. Marcel, and J. Fierrez. “Image Quality Assessment for Fake Biometric Detection: Application to Iris, Fingerprint and Face Recognition”. In: *IEEE Transactions on Image Processing* 23.2 (Feb. 2014), pp. 710–724. DOI: <http://dx.doi.org/10.1109/TIP.2013.2292332>.
- [178] M.I. Mandasari, M. Günther, R. Wallace, R. Saeidi, S. Marcel, and D. Leeuwen. “Score Calibration in Face Recognition”. In: *IET Biometrics* 3.4 (Feb. 2014). (in press), pp. 246–256. DOI: [10.1049/iet-bmt.2013.0066](https://doi.org/10.1049/iet-bmt.2013.0066).
- [180] T.d.F. Pereira, J. Komulainen, A. Anjos, JM. Martino, A. Hadid, M. Pietikainen, and S. Marcel. “Face liveness detection using dynamic texture”. In: *EURASIP Journal on Image and Video Processing* 4 (2014). DOI: <http://dx.doi.org/10.1186/1687-5281-2014-2>.
- [184] A. Anjos and S. Marcel. “Motion-Based Counter-Measures to Photo Attacks in Face Recognition”. In: *IET Biometrics* (Sept. 2013). (in press). DOI: <http://digital-library.theiet.org/content/journals/10.1049/iet-bmt.2012.0071>.
- [191] E. Khoury, L. El Shafey, C. McCool, M. Günther, and S. Marcel. “Bi-Modal Biometric Authentication on Mobile Phones in Challenging Conditions”. In: *Image and Vision Computing* (Oct. 2013). DOI: <http://dx.doi.org/10.1016/j.imavis.2013.10.001>.
- [194] S. Marcel. “BEAT Biometrics evaluation and testing”. In: *Biometric Technology Today* 2013.1 (2013), pp. 5–7. DOI: [http://dx.doi.org/10.1016/S0969-4765\(13\)70014-6](http://dx.doi.org/10.1016/S0969-4765(13)70014-6).
- [196] C. McCool, R. Wallace, M. McLaren, L. El-Shafey, and S. Marcel. “Session Variability Modelling for Face Authentication”. In: *IET Biometrics* 2.3 (Sept. 2013). IET Premium Award 2015, pp. 117–129.
- [199] L. El-Shafey, C. McCool, R. Wallace, and S. Marcel. “A Scalable Formulation of Probabilistic Linear Discriminant Analysis: Applied to Face Recognition”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* 35.7 (July 2013), pp. 1788–1794. DOI: [10.1109/TPAMI.2013.38](https://doi.org/10.1109/TPAMI.2013.38).
- [200] V.B. Subburaman and S. Marcel. “Alternative Search Techniques for Face Detection using Location Estimation and Binary Features”. In: *Computer Vision and Image Understanding* 117.5 (2013), pp. 551–570. DOI: [10.1016/j.cviu.2013.01.002](https://doi.org/10.1016/j.cviu.2013.01.002).
- [207] A. Roy, M-M. Doss, and S. Marcel. “A Fast Parts-based Approach to Speaker Verification using Boosted Slice Classifiers”. In: *IEEE Transactions on Information Forensics and Security* 7.1 (2012), pp. 241–254.
- [210] P. Tresadern, C. McCool, N. Poh, P. Matejka, H. Abdenour, C. Levy, T. Cootes, and S. Marcel. “Mobile Biometrics (MoBio): Joint Face and Voice Verification for a Mobile Platform”. In: *IEEE Pervasive Computing* 12.1 (2012), pp. 79–87.
- [211] R. Wallace, M. McLaren, C. McCool, and S. Marcel. “Cross-pollination of normalisation techniques from speaker to face authentication using Gaussian mixture models”. In: *IEEE Transactions on Information Forensics and Security* 7.2 (2012), pp. 553–562. DOI: [10.1109/TIFS.2012.2184095](https://doi.org/10.1109/TIFS.2012.2184095).
- [220] J. Galbally, C. McCool, J. Fierrez, S. Marcel, and J. Ortega-Garcia. “On the Vulnerability of Face Verification Systems to Hill-Climbing Attacks”. In: *Pattern Recognition* 43.3 (2010), pp. 1027–1038.
- [221] G. Heusch and S. Marcel. “A Novel Statistical Generative Model Dedicated To Face Recognition”. In: *Image and Vision Computing* 28.1 (2010), pp. 101–110.
- [225] C. McCool and S. Marcel. “Feature Distribution Modelling Techniques for 3D Face Verification”. In: *Pattern Recognition Letters* 31.11 (2010), pp. 1324–1330. DOI: [10.1016/j.patrec.2010.01.029](https://doi.org/10.1016/j.patrec.2010.01.029).

- [226] N. Poh, C-H. Chan, J. Kittler, S. Marcel, C. Mc Cool, E. Argones-Rúa, J-L. Alba-Castro, M. Villegas, R. Paredes, V. Struc, N. Pavesic, A.A. Salah, H. Fang, and N. Costen. “An Evaluation of Video-to-video Face Verification”. In: *IEEE Transactions on Information Forensics and Security* 5.4 (2010), pp. 781–801.
- [236] A. Just and S. Marcel. “A comparative study of two state-of-the-art sequence processing techniques for hand gesture recognition”. In: *Computer Vision and Image Understanding* 113.4 (Apr. 2009), pp. 532–543.
- [243] S. Marcel and J.d.R. Millán. “Person Authentication using Brainwaves (EEG) and Maximum A Posteriori Model Adaptation”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence - Special Issue on Biometrics* 29.4 (Apr. 2007), pp. 743–748.
- [244] S. Marcel, Y. Rodriguez, and G. Heusch. “On the Recent Use of Local Binary Patterns for Face Authentication”. In: *International Journal on Image and Video Processing Special Issue on Facial Image Processing* (2007). (accepted for publication but withdrawn because of author charges).
- [263] S. Bengio, C. Marcel, S. Marcel, and J. Mariéthoz. “Confidence Measures for Multimodal Identity Verification”. In: *Information Fusion* 3.04 (2002), pp. 267–276.

Peer Reviewed Book Chapters

- [86] Anjith George and Sébastien Marcel. “Multi-channel Face Presentation Attack Detection Using Deep Learning”. In: *Deep Learning-Based Face Analytics*. Ed. by Nalini Ratha, Vishal Patel, and Rama Chellappa. Springer, 2021. Chap. 13.
- [103] André Anjos, Pedro Tome, and Sébastien Marcel. “An Introduction to Vein Presentation Attacks and Detection”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. 2nd. Springer International Publishing, 2019. Chap. 18. ISBN: 978-3-319-92627-8. DOI: [10.1007/978-3-319-92627-8](https://doi.org/10.1007/978-3-319-92627-8). URL: <https://www.springer.com/us/book/9783319926261>.
- [104] Sushil Bhattacharjee, Amir Mohammadi, André Anjos, and Sébastien Marcel. “Recent Advances in Face Presentation Attack Detection”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. 2nd. Advances in Computer Vision and Pattern Recognition. Springer, Apr. 2019. Chap. 10. ISBN: 978-3-319-92627-8.
- [105] Ivana Chingovska, Amir Mohammadi, André Anjos, and Sébastien Marcel. “Evaluation Methodologies for Biometric Presentation Attack Detection”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. 2nd. Springer International Publishing, 2019. Chap. 20. ISBN: 978-3-319-92627-8. DOI: [10.1007/978-3-319-92627-8](https://doi.org/10.1007/978-3-319-92627-8). URL: <https://www.springer.com/us/book/9783319926261>.
- [110] Guillaume Heusch and Sébastien Marcel. “Remote Blood Pulse Analysis for Face Presentation Attack Detection”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. 2nd. Advances in Computer Vision and Pattern Recognition. Springer, Apr. 2019. Chap. 10. ISBN: 978-3-319-92627-8.
- [112] Pavel Korshunov and Sébastien Marcel. “A Cross-database Study of Voice Presentation Attack Detection”. In: *Handbook of Biometric Anti-Spoofing: Presentation Attack Detection, 2nd Edition*. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. Springer, Nov. 2019. Chap. 19.
- [137] P. Korshunov and S. Marcel. “Presentation attack detection in voice biometrics”. In: *User-Centric Privacy and Security in Biometrics*. Ed. by Claus Viehauer. The Institution of Engineering and Technology, 2017. Chap. 7, pp. 247–280.
- [142] I. Chingovska, N. Erdogmus, A. Anjos, and S. Marcel. “Face Recognition Systems Under Spoofing Attacks”. In: *Face Recognition Across the Imaging Spectrum*. Ed. by T. Bourlai. Springer, 2016. Chap. 8, pp. 165–194. DOI: [10.1007/978-3-319-28501-6_8](https://doi.org/10.1007/978-3-319-28501-6_8).
- [145] M. Gunther, L. El Shafey, and S. Marcel. “Face Recognition in Challenging Environments: An Experimental and Reproducible Research Survey”. In: *Face Recognition Across the Imaging Spectrum*. Ed. by T. Bourlai. Springer, 2016. Chap. 11, pp. 247–280. DOI: [10.1007/978-3-319-28501-6_11](https://doi.org/10.1007/978-3-319-28501-6_11).
- [165] A. Anjos, J. Komulainen, A. Hadid S. Marcel, and M. Pietikäinen. “Face Anti-Spoofing: Visual Approach”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by S. Marcel, M.S. Nixon, and S.Z. Li. (in press). Springer, 2014. Chap. 5. DOI: [10.1007/978-1-4471-6524-8](https://doi.org/10.1007/978-1-4471-6524-8).
- [167] I. Chingovska, A. Anjos, and S. Marcel. “Evaluation Methodologies”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by S. Marcel, M.S. Nixon, and S.Z. Li. (in press). Springer, 2014. Chap. 11. DOI: [10.1007/978-1-4471-6524-8](https://doi.org/10.1007/978-1-4471-6524-8).
- [168] N. Erdogmus and S. Marcel. “Introduction”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by S. Marcel, M.S. Nixon, and S.Z. Li. (in press). Springer, 2014. Chap. 5. DOI: [10.1007/978-1-4471-6524-8](https://doi.org/10.1007/978-1-4471-6524-8).
- [177] S.Z. Li, Javier Galbally, A. Anjos, and S. Marcel. “Evaluation Databases”. In: *Handbook of Biometric Anti-Spoofing*. Ed. by S. Marcel, M.S. Nixon, and S.Z. Li. (in press). Springer, 2014. Chap. 14. DOI: [10.1007/978-1-4471-6524-8](https://doi.org/10.1007/978-1-4471-6524-8).
- [195] S. Marcel. “Face recognition for biometrics”. In: *Interactive Multimodal Information Management*. Ed. by H. Bourlard and A. Popescu-Belis. EPFL Press, 2013. Chap. 8.
- [212] P. Zemčík, S. Marcel, and J. Mlích. “Video processing and recognition”. In: *Multimodal Signal Processing: Human Interactions in Meetings*. Ed. by S. Renals, H. Bourlard, J. Carletta, and A. Popescu-Belis. Cambridge University Press, 2012. Chap. 7.

Books

- [75] S. Marcel, J. Fierrez, and N. Evans. *Handbook of Biometric Anti-Spoofing (Ed 3)*. Springer, 2022.
- [116] S. Marcel, M.S. Nixon, J. Fierrez, and N. Evans. *Handbook of Biometric Anti-Spoofing (Ed 2)*. Springer, 2019. DOI: [10.1007/978-3-319-92627-8](https://doi.org/10.1007/978-3-319-92627-8).
- [119] A. Uhl, C. Busch, S. Marcel, and R. Veldhuis. *Handbook of Vascular Biometrics*. (in press). Springer, 2019.
- [179] S. Marcel, M.S. Nixon, and S.Z. Li. *Handbook of Biometric Anti-Spoofing (Ed 1)*. (in press). Springer, 2014. DOI: [10.1007/978-1-4471-6524-8](https://doi.org/10.1007/978-1-4471-6524-8).

Peer Reviewed Conference Proceedings

- [1] Hatef Otroshi Shahreza and Sébastien Marcel. “Benchmarking Multimodal Large Language Models for Face Recognition”. In: *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2026. URL: <https://www.idiap.ch/paper/facerecbench/>.
- [2] David Geissbühler, Hatef Otroshi Shahreza, and Sébastien Marcel. “Synthetic Face Datasets Generation via Latent Space Exploration from Brownian Identity Diffusion”. In: *International Conference on Machine Learning*. 2025.
- [3] Anjith George and Sébastien Marcel. “Digi2Real: Bridging the Realism Gap in Synthetic Data Face Recognition via Foundation Models”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2025.
- [4] Anjith George and Sébastien Marcel. “EdgeDoc: Hybrid CNN-Transformer Model for Accurate Forgery Detection and Localization in ID Documents”. In: *ICCV*. 2025.
- [5] Anjith George and Sébastien Marcel. “Enhancing Domain Diversity in Synthetic Data Face Recognition with Dataset Fusion”. In: *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*. 2025.
- [6] Anjith George and Sébastien Marcel. “The Invisible Threat: Evaluating the Vulnerability of Cross-Spectral Face Recognition to Presentation Attacks”. In: *International Joint Conference on Biometrics (IJCB 2025)*, IEEE. 2025.
- [7] Anjith George and Sébastien Marcel. “xEdgeFace: Efficient Cross-Spectral Face Recognition for Edge Devices”. In: *International Joint Conference on Biometrics (IJCB 2025)*, IEEE. 2025.
- [8] Alain Komaty, Hatef Otroshi Shahreza, Anjith George, and Sébastien Marcel. “Exploring ChatGPT for Face Presentation Attack Detection in Zero and Few-Shot in-Context Learning”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2025.
- [9] Pavel Korshunov, Ketan Kotwal, Christophe Ecabert, Vidit Vidit, Amir Mohammadi, and Sébastien Marcel. “Investigation of accuracy and bias in face recognition trained with synthetic data”. In: *Proceedings of IEEE International Joint Conference on Biometrics*. 2025.
- [10] Pavel Korshunov, Amir Mohammadi, Vidit Vidit, Christophe Ecabert, and Sébastien Marcel. “FantasyID: A dataset for detecting digital manipulations of ID-documents”. In: *Proceedings of IEEE International Joint Conference on Biometrics*. 2025.
- [11] Pavel Korshunov, Vidit Vidit, Amir Mohammadi, Christophe Ecabert, Nevena Shamoska, Sébastien Marcel, Zeqin Yu, Ye Tian, Jiangqun Ni, Lazar Lazarevic, Renat Khizbullin, Anastasiia Evteeva, Alexey Tochin, Aleksei Grishin, Anjith George, Daniel DeAlcala, Tamas Endrei, Javier Munoz-Haro, Ruben Tolosana, Ruben Vera-Rodriguez, Aythami Morales, Julian Fierrez, Gyorgy Cserey, Hardik Sharma, Sachin Chaudhary, Akshay Dudhane, Praful Hambarde, Amit Shukla, Prateek Shaily, Jayant Kumar, Ajinkya Hase, Satish Maurya, Mridul Sharma, and Pallav Dwivedi. “DeepID Challenge of Detecting Synthetic Manipulations in ID Documents”. In: *International Conference on Computer Vision (ICCV)*. 2025.
- [13] Michiel van der Meer, Pavel Korshunov, Sébastien Marcel, and Lonneke van der Plas. “HintsOfTruth: A Multimodal Checkworthiness Detection Dataset with Real and Synthetic Claims”. In: *The 63rd Annual Meeting of the Association for Computational Linguistics*. 2025.
- [14] Hatef Otroshi Shahreza, Laurent Colbois, and Sébastien Marcel. “3D Face Morph Generation Using Geometry-Aware Template Inversion”. In: *Proceedings of the IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*. 2025. DOI: [10.1109/MLSP62443.2025.11204286](https://doi.org/10.1109/MLSP62443.2025.11204286). URL: <https://ieeexplore.ieee.org/abstract/document/11204286>.
- [15] Hatef Otroshi Shahreza, Anjith George, and Sébastien Marcel. “Face Reconstruction from Face Embeddings using Adapter to a Face Foundation Model”. In: *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*. 2025.
- [17] Hatef Otroshi Shahreza and Sébastien Marcel. “FaceLLM: A Multimodal Large Language Model for Face Understanding”. In: *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*. 2025. URL: <https://arxiv.org/pdf/2507.10300>.
- [19] Hatef Otroshi Shahreza and Sébastien Marcel. “HyperFace: Generating Synthetic Face Recognition Datasets by Exploring Face Embedding Hypersphere”. In: *International Conference on Learning Representations*. 2025.
- [20] Rahimi Parsa, Damien Teney, and Sébastien Marcel. “AugGen: Synthetic Augmentation using Diffusion Models Can Improve Recognition”. In: *The Thirty-ninth Annual Conference on Neural Information Processing Systems*. 2025.

-
- [21] Francois Poh, Anjith George, and Sébastien Marcel. “ArtFace: Towards Historical Portrait Face Identification via Model Adaptation”. In: *(Non-Archival)*. 2025, p. 4. URL: <https://www.idiap.ch/paper/artface/>.
- [22] Luis S. Luevano, Pavel Korshunov, and Sébastien Marcel. “Identity-Preserving Aging and De-Aging of Faces in the Style-GAN Latent Space”. In: *2025 IEEE International Joint Conference on Biometrics (IJCB)*. IEEE, 2025.
- [23] Juan E. Tapia, Nieto Mario, Juan Espin, Alvaro Sanchez, Naser Damer, Christoph Busch, Marija Ivanovska, Leon Todorov, Renat Khizbullin, Aleksei Grishin, Lazar Lazarevic, Daniel Schulz, Sebastian Gonzalez, Amir Mohammadi, Ketan Kotwal, Sébastien Marcel, Raghavendra Mudgalgundurao, Kiran B. Raja, Patrick Schuch, Pedro Couto, Joao Pinto, Mariana Xavier, Andres Valenzuela, Borut Batagelj, Javier Barrachina, Marko Peterlin, Peter Peer, Ajnas Muhammed, Diogo Nunes, Nuno Gonçalves, Sushrut Patwardhan, and Raghavendra Ramachandra. “Second Competition on Presentation Attack Detection on ID Card”. In: *IEEE International Joint Conference on Biometrics (IJCB)*. 2025.
- [24] Vidit Vidit, Pavel Korshunov, Amir Mohammadi, Christophe Ecabert, Ketan Kotwal, and Sébastien Marcel. “Detecting Text Manipulation in Images using Vision Language Models”. In: *36th British Machine Vision Conference 2025*. 2025.
- [25] Sushil Bhattacharjee, David Geissbuhler, Guillaume Clivaz, Ketan Kotwal, and Sébastien Marcel. “Vascular Biometrics Experiments on CANDY – A New Contactless Finger-Vein Dataset”. In: *IAPR International Conference on Pattern Recognition*. 2024.
- [26] Laurent Colbois and Sébastien Marcel. “Evaluating the Effectiveness of Attack-Agnostic Features for Morphing Attack Detection”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [29] Anjith George and Sébastien Marcel. “Heterogeneous Face Recognition Using Domain Invariant Units”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024.
- [30] Anjith George and Sébastien Marcel. “Modality Agnostic Heterogeneous Face Recognition with Switch Style Modulators”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [31] Ahmad Hassanpour, Yasamin Kowsari, Hatf Otrosi Shahreza, Bian Yang, and Sébastien Marcel. “ChatGPT and biometrics: an assessment of face recognition, gender detection, and age estimation capabilities”. In: *IEEE International Conference on Image Processing*. 2024.
- [32] Ketan Kotwal and Sébastien Marcel. “Demographic Fairness Transformer for Bias Mitigation in Face Recognition”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [33] Ketan Kotwal and Sébastien Marcel. “Mitigating Demographic Bias in Face Recognition via Regularized Score Calibration”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2024.
- [34] Ketan Kotwal, Gokhan Ozbulak, and Sébastien Marcel. “Assessing the Reliability of Biometric Authentication on Virtual Reality Devices”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [35] Yu Linghu, Tiago de Freitas Pereira, Christophe Ecabert, Sébastien Marcel, and Manuel Güther. “Score Normalization for Demographic Fairness in Face Recognition”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [36] Hatf Otrosi Shahreza, Christophe Ecabert, Anjith George, Alexander Unnervik, and Sébastien Marcel. “SDFR: Synthetic Data for Face Recognition Competition”. In: *IEEE International Conference on Automatic Face and Gesture Recognition*. 2024.
- [39] Hatf Otrosi Shahreza and Sébastien Marcel. “Breaking Template Protection: Reconstruction of Face Images from Protected Facial Templates”. In: *IEEE International Conference on Automatic Face and Gesture Recognition*. 2024.
- [40] Hatf Otrosi Shahreza and Sébastien Marcel. “Face Reconstruction from Partially Leaked Facial Embeddings”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024. DOI: [10.1109/ICASSP48485.2024.10445870](https://doi.org/10.1109/ICASSP48485.2024.10445870).
- [42] Hatf Otrosi Shahreza and Sébastien Marcel. “Unveiling Synthetic Faces: How Synthetic Datasets Can Expose Real Identities”. In: *Neural Information Processing Systems (NeurIPS) workshop on New Frontiers in Adversarial Machine Learning*. 2024.
- [44] Hatf Otrosi Shahreza, Alexandre Veuthey, and Sébastien Marcel. “Face Recognition Using Lensless Camera”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024. DOI: [10.1109/ICASSP48485.2024.10446710](https://doi.org/10.1109/ICASSP48485.2024.10446710).
- [45] Nathan Ramoly, Alain Komaty, Vedrana Krivokuca, Lara Younes, Ahmad-Montaser Awal, and Sébastien Marcel. “A Novel and Responsible Dataset for Face Presentation Attack Detection on Mobile Devices”. In: *International Joint Conference on Biometrics (IJCB)*. 2024.
- [47] Behrooz Razeghi, Parsa Rahimi, and Sébastien Marcel. “Deep Variational Privacy Funnel: General Modeling with Applications in Face Recognition”. In: *IEEE International Conference on Acoustics, Speech, and Signal Processing*. 2024.
- [48] Alexander Unnervik, Hatf Otrosi Shahreza, Anjith George, and Sébastien Marcel. “HyperFace: Generating Synthetic Face Recognition Datasets by Exploring Face Embedding Hypersphere”. In: *Neural Information Processing Systems (NeurIPS) workshop on Safe Generative AI*. 2024.
- [49] Alexander Unnervik, Hatf Otrosi Shahreza, Anjith George, and Sébastien Marcel. “Model Pairing Using Embedding Translation for Backdoor Attack Detection on Open-Set Classification Tasks”. In: *Neural Information Processing Systems (NeurIPS) workshop on Safe Generative AI*. 2024.

-
- [50] Laurent Colbois, Hatem Otroushi Shahreza, and Sébastien Marcel. “Approximating Optimal Morphing Attacks using Template Inversion”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [51] Ziga Emersic, Tetsushi Ohki, Muku Akasaka, Takahiko Arakawa, Soshi Maeda, Masora Okano, Yuya Sato, Anjith George, Sébastien Marcel, Iyyakutti Iyappan Ganapathi, Syed Sadaf Ali, Sajid Javed, Naoufel Werghi, Selin Gok Isik, Erdi Saritas, Hazim Kemal Ekenel, Valter Hudovernik, Jan Niklas Kolf, Fadi Boutros, Naser Damer, Geetanjali Sharma, Aman Kamboj, Aditya Nigam, Deepak Kumar Jain, Guillermo Camara, Peter Peer, and Vitomir Struc. “The Unconstrained Ear Recognition Challenge 2023: Maximizing Performance and Minimizing Bias”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [52] Anjith George and Sébastien Marcel. “Bridging the Gap: Heterogeneous Face Recognition with Conditional Adaptive Instance Modulation”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [54] Jan Niklas Kolf, Fadi Boutros, Jurek Elliesen, Markus Theuerkauf, Naser Damer, Mohamad Alansari, Oussama Abdul Hay, Sara Alansari, Sajid Javed, Naoufel Werghi, Klemen Grm, Vitomir Struc, Fernando Alonso-Fernandez, Kevin Hernandez Diaz, Josef Bigun, Anjith George, Christophe Ecabert, Hatem Otroushi Shahreza, Ketan Kotwal, Sébastien Marcel, Iurii Medvedev, Bo Jin, Diogo Nunes, Ahmad Hassanpour, Pankaj Khatiwada, Aafan Ahmad Toor, and Bian Yang. “EFAr 2023: Efficient Face Recognition Competition”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [55] Alain Komaty, Vedrana Krivokuca, Christophe Ecabert, and Sébastien Marcel. “Can personalised hygienic masks be used to attack face recognition systems?” In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [56] Pavel Korshunov, Haolin Chen, Philip N. Garner, and Sébastien Marcel. “Vulnerability of Automatic Identity Recognition to Audio-Visual Deepfakes”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [57] Pietro Melzi, Hatem Otroushi Shahreza, Christian Rathgeb, Ruben Tolosana, Ruben Vera-Rodriguez, Julian Fierrez, Sébastien Marcel, and Christoph Busch. “Multi-IVE: Privacy Enhancement of Multiple Soft-Biometrics in Face Embeddings”. In: *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2023.
- [58] Hatem Otroushi Shahreza, Anjith George, and Sébastien Marcel. “SynthDistill: Face Recognition with Knowledge Distillation from Synthetic Data”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [59] Hatem Otroushi Shahreza, Vedrana Krivokuca, and Sébastien Marcel. “MLP-Hash: Protecting Face Templates via Hashing of Randomized Multi-Layer Perceptron”. In: *European Signal Processing Conference (EUSIPCO)*. 2023.
- [60] Hatem Otroushi Shahreza and Sébastien Marcel. “Blackbox Face Reconstruction from Deep Facial Embeddings Using A Different Face Recognition Model”. In: *IEEE International Conference on Image Processing (ICIP)*. 2023. DOI: [10.1109/ICIP49359.2023.10222312](https://doi.org/10.1109/ICIP49359.2023.10222312).
- [62] Hatem Otroushi Shahreza and Sébastien Marcel. “Face Reconstruction from Facial Templates by Learning Latent Space of a Generator Network”. In: *Conference on Neural Information Processing Systems (NeurIPS)*. 2023.
- [65] Parsa Rahimi, Christophe Ecabert, and Sébastien Marcel. “Toward responsible face datasets: modeling the distribution of a disentangled latent space for sampling face images from demographic groups”. In: *International Joint Conference on Biometrics (IJCB)*. 2023.
- [66] Laurent Colbois and Sébastien Marcel. “On the detection of morphing attacks generated by GANs”. In: *21st International Conference of the Biometrics Special Interest Group (BIOSIG 2022)*. 2022.
- [68] Pavel Korshunov, Anubhav Jain, and Sébastien Marcel. “Custom attribution loss for improving generalization and interpretability of deepfake detection”. In: *International Conference on Acoustics, Speech and Signal Processing*. 2022.
- [69] Pavel Korshunov and Sébastien Marcel. “Face Anthropometry Aware Audio-visual Age Verification”. In: *ACM Multimedia*. 2022.
- [71] Ketan Kotwal and Sébastien Marcel. “Fairness Index Measures to Evaluate Bias in Biometric Recognition”. In: *International Conference on Pattern Recognition Workshops*. 2022.
- [72] Ketan Kotwal and Sébastien Marcel. “Residual Feature Pyramid Network for Enhancement of Vascular Patterns”. In: *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops*. 2022.
- [76] Dailé Osorio-Roig, Christian Rathgeb, Hatem Otroushi Shahreza, Christoph Busch, and Sébastien Marcel. “Indexing Protected Deep Face Templates by Frequent Binary Patterns”. In: *Proceedings of the 2022 International Joint Conference on Biometrics (IJCB)*. 2022.
- [77] Hatem Otroushi Shahreza, Vedrana Krivokuca, and Sébastien Marcel. “Face Reconstruction from Deep Facial Embeddings using A Convolutional Neural Network”. In: *Proceedings of the 29th IEEE International Conference on Image Processing*. 2022.
- [78] Hatem Otroushi Shahreza, Christian Rathgeb, Dailé Osorio-Roig, Vedrana Krivokuca, Sébastien Marcel, and Christoph Busch. “Hybrid Protection of Biometric Templates by Combining Homomorphic Encryption and Cancelable Biometrics”. In: *Proceedings of the 2022 International Joint Conference on Biometrics (IJCB)*. 2022.
- [79] Eklavya Sarkar, Pavel Korshunov, Laurent Colbois, and Sébastien Marcel. “Are GAN-based Morphs Threatening Face Recognition?” In: *International Conference on Acoustics, Speech and Signal Processing*. 2022.
- [81] Alexander Unnervik and Sébastien Marcel. “An anomaly detection approach for backdoored neural networks: face recognition as a case study”. In: *21st International Conference of the Biometrics Special Interest Group (BIOSIG 2022)*. 2022.
-

-
- [82] Victor Bros, Ketan Kotwal, and Sébastien Marcel. “Vein Enhancement with Deep Auto-Encoders to improve Finger Vein Recognition”. In: *IEEE Biometrics Special Interest Group (BIOSIG)*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4648>.
- [83] Laurent Colbois, Tiago de Freitas, and Sébastien Marcel. “On the use of automatically generated synthetic image datasets for benchmarking face recognition”. In: *IEEE/IAPR International Joint Conference on Biometrics*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4567>.
- [85] Anjith George and Sébastien Marcel. “Cross Modal Focal Loss for RGBD Face Anti-Spoofing”. In: *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. 2021. URL: <http://publications.idiap.ch/index.php/publications/show/4506>.
- [87] Anjith George and Sébastien Marcel. “On the Effectiveness of Vision Transformers for Zero-shot Face Anti-Spoofing”. In: *IEEE/IAPR International Joint Conference on Biometrics*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4557>.
- [89] Anubhav Jain, Pavel Korshunov, and Sébastien Marcel. “Improving Generalization of Deepfake Detection by Training for Attribution”. In: *International Workshop on Multimedia Signal Processing*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4635>.
- [91] Pavel Korshunov and Sébastien Marcel. “Subjective and objective evaluation of deepfake videos”. In: *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4543>.
- [92] Hatef Otroschi, Vedrana Krivokuca, and Sébastien Marcel. “On the Recognition Performance of BioHashing on state-of-the-art Face Recognition models”. In: *Proceedings of the 13th IEEE International Workshop on Information Forensics and Security (WIFS)*. IEEE, 2021. DOI: [10.1109/WIFS53200.2021.9648382](https://doi.org/10.1109/WIFS53200.2021.9648382). URL: <https://ieeexplore.ieee.org/document/9648382>.
- [93] Hatef Otroschi and Sébastien Marcel. “Deep Auto-Encoding and Biohashing for Secure Finger Vein Recognition”. In: *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2021. URL: <https://publications.idiap.ch/index.php/publications/show/4544>.
- [95] Priyanka Das, Joseph McGrath, Zhaoyuan Fang, Aidan Boyd, Ganghee Jang, Amir Mohammadi, Sandip Purnapatra, David Yambay, Sébastien Marcel, Mateusz Trokielewicz, Piotr Maciejewicz, Kevin Bowyer, Adam Czajka, and Stephanie Schuckers. “Iris Liveness Detection Competition (LivDet-Iris) ? The 2020 Edition”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2020.
- [98] Ketan Kotwal and Sébastien Marcel. “CNN Patch Pooling for Detecting 3D Mask Presentation Attacks in NIR”. In: *IEEE International Conference on Image Processing (ICIP)*. 2020.
- [99] Amir Mohammadi, Sushil Bhattacharjee, and Sébastien Marcel. “Domain Adaptation For Generalization Of Face Presentation Attack Detection In Mobile Settings With Minimal Information”. In: *45th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2020.
- [100] Amir Mohammadi, Sushil Bhattacharjee, and Sébastien Marcel. “Improving Cross-dataset Performance Of Face Presentation Attack Detection Systems Using Face Recognition Datasets”. In: *45th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2020.
- [101] Huy H. Nguyen, Junichi Yamagishi, Isao Echizen, and S. Marcel. “Generating Master Faces for Use in Performing Wolf Attacks on Face Recognition Systems”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2020.
- [102] Seyyed Saeed Sarfjoo, Madikeri, Srikanth, Petr Motlicek, and Sébastien Marcel. “Supervised domain adaptation for text-independent speaker verification using limited data”. In: *Proceedings of Interspeech*. 2020.
- [107] Anjith George and Sébastien Marcel. “Deep Pixel-wise Binary Supervision for Face Presentation Attack Detection”. In: *The 12th IAPR International Conference on Biometrics (ICB 2019)*. 2019.
- [111] Pavel Korshunov, Michael Halstead, Diego Castan, Martin Graciarena, Mitchell McLaren, Brian Burns, Aaron Lawson, and Sébastien Marcel. “Tampered Speaker Inconsistency Detection with Phonetically Aware Audio-visual Features”. In: *The Thirty-sixth International Conference on Machine Learning (ICML) Workshop on Synthetic Realities*. Best Paper Award AI Foundation. 2019.
- [113] Pavel Korshunov and Sébastien Marcel. “Vulnerability assessment and detection of Deepfake videos”. In: *The 12th IAPR International Conference on Biometrics (ICB 2019)*. 2019.
- [117] Olegs Nikisins, Anjith George, and Sébastien Marcel. “Domain Adaptation in Multi-Channel Autoencoder based Features for Robust Face Anti-Spoofing”. In: *The 12th IAPR International Conference on Biometrics (ICB 2019)*. 2019.
- [118] Ramachandra Raghavendra, Sushma Venkatesh, Kiran B. Raja, Sushil Bhattacharjee, Pankaj Wasnik, Sébastien Marcel, and Christoph Busch. “Custom Silicone Face Masks - Vulnerability of Commercial Face Recognition Systems and Presentation Attack Detection”. In: *Proceedings of 7th IAPR/IEEE International Workshop on Biometrics and Forensics*. IAPR Best Paper Award. May 2019.
- [120] Sushil Bhattacharjee, Amir Mohammadi, and Sébastien Marcel. “Spoofing Deep Face Recognition With Custom Silicone Masks”. In: *IEEE 7th International Conference on Biometrics: Theory, Applications and Systems*. 2018.

-
- [121] Guillaume Heusch and Sébastien Marcel. "Pulse-based Features for Face Presentation Attack Detection". In: *IEEE 7th International Conference on Biometrics: Theory, Applications and Systems, special session on Image and Video Forensics in Biometrics*. 2018.
- [122] Pavel Korshunov, André R. Goncalves, Ricardo P. V. Violato, Flávio O. Simões, and Sébastien Marcel. "On the Use of Convolutional Neural Networks for Speech Presentation Attack Detection". In: *International Conference on Identity, Security and Behavior Analysis*. 2018.
- [123] Pavel Korshunov and Sébastien Marcel. "Speaker Inconsistency Detection in Tampered Video". In: *European Signal Processing Conference*. 2018.
- [124] Vedrana Krivokuca and Sébastien Marcel. "Towards Quantifying the Entropy of Fingervein Patterns across Different Feature Extractors". In: *2018 IEEE 4th International Conference on Identity, Security, and Behavior Analysis (ISBA)*. 2018.
- [125] Hannah Muckenhirn, Mathew Magimai-Doss, and Sébastien Marcel. "On Learning Vocal Tract System Related Speaker Discriminative Information from Raw Signal Using CNNs". In: *Proceedings of Interspeech*. Sept. 2018.
- [126] Hannah Muckenhirn, Mathew Magimai-Doss, and Sébastien Marcel. "Towards directly modeling raw speech signal for speaker verification using CNNs". In: *IEEE International Conference on Acoustics, Speech and Signal Processing*. 2018.
- [127] Olegs Nikisins, Teodors Eglitis, André Anjos, and Sébastien Marcel. "Fast cross-correlation based wrist vein recognition algorithm with rotation and translation compensation". In: *Sixth International Workshop on Biometrics and Forensics*. June 2018.
- [128] Olegs Nikisins, Amir Mohammadi, André Anjos, and Sébastien Marcel. "On Effectiveness of Anomaly Detection Approaches against Unseen Presentation Attacks in Face Anti-Spoofing". In: *The 11th IAPR International Conference on Biometrics (ICB 2018)*. 2018.
- [130] A. Anjos, M. Günther, T. de Freitas Pereira, P. Korshunov, A. Mohammadi, and S. Marcel. "Continuously Reproducing Toolchains in Pattern Recognition and Machine Learning Experiments". In: *International Conference on Machine Learning*. 2017.
- [131] A. Anjos, L. El-Shafey, and S. Marcel. "BEAT: An Open-Science Web Platform". In: *International Conference on Machine Learning*. 2017.
- [132] S. Bhattacharjee and S. Marcel. "What you can't see can help you: extended-range imaging for 3D-mask presentation attack detection". In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2017.
- [133] Z. Boulkenafet and al. "A Competition on Generalized Software-based Face Presentation Attack Detection in Mobile Scenarios". In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2017.
- [134] M. Cernak, A. Komaty, A. Mohammadi, A. Anjos, and S. Marcel. "Bob Speaks Kaldi". In: *Interspeech*. 2017.
- [135] A.R. Goncalves, P. Korshunov, R.P.V. Violato, F.O. Simões, and S. Marcel. "On the Generalization of Fused Systems in Voice Presentation Attack Detection". In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2017.
- [140] H. Muckenhirn, M. Magimai-Doss, and S. Marcel. "End-to-End Convolutional Neural Network-based Voice Presentation Attack Detection". In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2017.
- [141] A. Sequeira and al. "Cross-Eyed 2017: Cross-Spectral Iris/Periocular Recognition Database and Competition". In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2017.
- [143] A. Costa-Pazo, S. Bhattacharjee, E. Vazquez-Fernandez, and S. Marcel. "The REPLAY-MOBILE Face Presentation-Attack Database". In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2016.
- [144] T. de Freitas Pereira and S. Marcel. "Heterogeneous Face Recognition using Inter-Session Variability Modelling". In: *IEEE Computer Society Workshop on Biometrics*. 2016.
- [146] P. Korshunov and S. Marcel. "Cross-database evaluation of audio-based spoofing detection systems". In: *Interspeech*. 2016.
- [147] P. Korshunov and S. Marcel. "Joint Operation of Voice Biometrics and Presentation Attack Detection". In: *IEEE Sixth International Conference on Biometrics: Theory, Applications and Systems*. 2016.
- [148] P. Korshunov, S. Marcel, H. Muckenhirn, A. R. Goncalves, A. G. Souza Mello, R. P. Velloso Violato, F. Simoes, M. Uliani Neto, M. de Assis Angeloni, J. A. Stuchi, H. Dinkel, N. Chen, Y. Qian, D. Paul, G. Saha, and Md Sahidullah. "Overview of BTAS 2016 Speaker Anti-spoofing Competition". In: *IEEE Sixth International Conference on Biometrics: Theory, Applications and Systems*. 2016.
- [150] H. Muckenhirn, M. Magimai-Doss, and S. Marcel. "Presentation Attack Detection Using Long-Term Spectral Statistics for Trustworthy Speaker Verification". In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2016.
- [151] R. Raghavendra, K. Raja, S. Marcel, and C. Busch. "Face Presentation Attack Detection Across Spectrum using Time-Frequency Descriptors of Maximal Response in Laplacian Scale-Space". In: *Sixth International Conference on Image Processing Theory, Tools and Applications (IPTA)*. 2016.
- [152] A. Sequeira and al. "Cross-Eyed: Cross-Spectral Iris/Periocular Recognition Database and Competition". In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2016. DOI: [10.1109/BIOSIG.2016.7736915](https://doi.org/10.1109/BIOSIG.2016.7736915).

-
- [154] N. Erdogmus, M. Vanoni, and S. Marcel. “Within- and Cross- Database Evaluations for Face Gender Classification via BeFIT Protocols”. In: *International Workshop on Multimedia Signal Processing*. 2015. DOI: [10.1109/MMSP.2014.6958797](https://doi.org/10.1109/MMSP.2014.6958797).
- [155] S. Ergunay, E. Khoury, A. Lazaridis, and S. Marcel. “On the Vulnerability of Speaker Verification to Realistic Voice Spoofing”. In: *IEEE Sixth International Conference on Biometrics: Theory, Applications and Systems*. 2015.
- [158] R. Mehta, M. Günther, and S. Marcel. “Gender Classification by LUT Based Boosting of Overlapping Block Patterns”. In: *Scandinavian Conference on Image Analysis (SCIA)*. 2015.
- [159] T. F. Pereira and S. Marcel. “Periocular Biometrics in Mobile Environment”. In: *IEEE Sixth International Conference on Biometrics: Theory, Applications and Systems*. 2015.
- [160] R. Raghavendra, M. Avinashy, S. Marcel, and C. Busch. “Finger vein Liveness Detection Using Motion Magnification”. In: *IEEE Sixth International Conference on Biometrics: Theory, Applications and Systems*. 2015.
- [162] P. Tome and S. Marcel. “On the Vulnerability to Palm Vein Recognition to Spoofing Attacks”. In: *IAPR International Conference on Biometrics (ICB)*. 2015.
- [163] P. Tome and S. Marcel. “Palm Vein Database and Experimental Framework for Reproducible Research”. In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2015.
- [164] P. Tome, R. Ramachandra, C. Busch, S. Tirunagari, N. Poh, B.H. Shekar, D. Gragnaniello, C. Sansone, and L. Verdoliva. “The 1st Competition on Counter Measures to Finger Vein Spoofing Attacks”. In: *IAPR International Conference on Biometrics (ICB)*. 2015.
- [170] J. Galbally and S. Marcel. “Face Anti-Spoofing Based on General Image Quality Assessment”. In: *IEEE International Conference on Pattern Recognition*. 2014.
- [173] E. Khoury, T. Kinnunen, A. Sizov, Z. Wu, and S. Marcel. “Introducing I-Vectors for Joint Anti-spoofing and Speaker Verification”. In: *Annual Conference of the International Speech Communication Association (INTERSPEECH)*. 2014.
- [174] E. Khoury, L. El Shafey, M. Ferras, and S. Marcel. “Hierarchical speaker clustering methods for the NIST i-vector Challenge”. In: *Odyssey: The Speaker and Language Recognition Workshop*. 2014.
- [175] E. Khoury, L. El Shafey, and S. Marcel. “SPEAR: An Open Source Toolbox for Speaker Recognition Based on Bob”. In: *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2014.
- [176] A. Lazaridis, E. Khoury, J-P. Goldman, M. Avanzi, S. Marcel, and P. Garner. “Swiss French Regional Accent Identification”. In: *Odyssey: The Speaker and Language Recognition Workshop*. 2014.
- [181] L. El Shafey, E. Khoury, and S. Marcel. “Audio-Visual Gender Recognition in Uncontrolled Environment Using Variability Modeling Techniques”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. IEEE/IAPR Best Paper Award. 2014.
- [182] P. Tome, M. Vanoni, and S. Marcel. “On the Vulnerability of Finger Vein Recognition to Spoofing”. In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2014.
- [183] M. Vanoni, P. Tome, L. ElShafey, and S. Marcel. “Cross-Database Evaluation with an Open Finger Vein Sensor”. In: *IEEE Workshop on Biometric Measurements and Systems for Security and Medical Applications (BioMS)*. 2014.
- [185] I. Chingovska, A. Anjos, and S. Marcel. “Anti-spoofing in action: joint operation with a verification system”. In: *IEEE Computer Vision and Pattern Recognition – Workshop on Biometrics (CVPR)*. 2013.
- [186] I. Chingovska, J. Yang, Z. Lei, D. Yi, S. Z. Li, O. Kähm, C. Glaser, N. Damer, A. Kuijper, A. Nouak, J. Komulainen, T. Pereira, A. Anjos, S. Gupta, S. Khandelwal, S. Bansal, A. Rai, T. Krishna, D. Goyal, M.-A. Waris, H. Zhang, I. Ahmad, S. Kiranyaz, M. Gabbouj, R. Tronci, M. Pili, N. Sirena, F. Roli, J. Galbally, J. Fierrez, A. Pinto, H. Pedrini, W. S. Schwartz, A. Rocha, and S. Marcel. “The 2nd Competition on Counter Measures to 2D Face Spoofing Attacks”. In: *IAPR International Conference on Biometrics (ICB)*. 2013.
- [187] N. Erdogmus and S. Marcel. “Spoofing 2D Face Recognition Systems with 3D Masks”. In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2013.
- [188] N. Erdogmus and S. Marcel. “Spoofing in 2D Face Recognition with 3D Masks and Anti-spoofing with Kinect”. In: *IEEE Sixth International Conference on Biometrics: Theory, Applications and Systems*. 2013.
- [189] M. Günther, A. Costa-Pazo, C. Ding, E. Boutellaa, G. Chiachia, H. Zhang, M. de Assis Angeloni, V. Štruc, E. Khoury, E. Vazquez-Fernandez, D. Tao, M. Bengherabi, D. Cox, S. Kiranyaz, T. de Freitas Pereira, J. Žganec-Gros, E. Argones-Rúa, N. Pinto, M. Gabbouj, F. Simões, S. Dobrišek, D. González-Jiménez, A. Rocha, M. Uliani Neto, N. Pavešić, A. Falcão, R. Violato, and S. Marcel. “The 2013 Face Recognition Evaluation in Mobile Environment”. In: *IAPR International Conference on Biometrics (ICB)*. 2013.
- [190] E. Khoury, M. Günther, L. ElShafey, and S. Marcel. “On the Improvements of Uni-modal and Bi-modal Fusions of Speaker and Face Recognition for Mobile Biometrics”. In: *Biometric Technologies in Forensic Science*. 2013.

- [192] E. Khoury, B. Vesnicer, J. Franco-Pedroso, R. Violato, Z. Boulkenafet, L.M. Mazaira Fernández, M. Diez, J. Kosmala, H. Khemiri, T. Cipr, R. Saeidi, M. Günther, L. El-Shafey, J. Žganec-Gros, R. Zazo Candil, F. Simões, M. Bengherabi, A. Álvarez Marquina, M. Penagarikano, A. Abad, M. Boulayemen, P. Schwarz, D. Van Leeuwen, J. González-Domínguez, M. Uliani Neto, E. Boutellaa, P. Gómez Vilda, A. Varona, S. Guedria, P. Matějka, J. González-Rodríguez, T. Pereira, F. Harizi, L. J. Rodríguez-Fuentes, D. Petrovska-Delacrétaz, M. Angeloni, G. Bordel, G. Chollet, and S. Marcel. “The 2013 Speaker Verification Evaluation In Mobile Environment Using The MOBIO Database”. In: *IAPR International Conference on Biometrics (ICB)*. 2013.
- [193] J. Komulainen, A. Anjos, A. Hadid, S. Marcel, and M. Pietikainen. “Complementary Countermeasures for Detecting Scenic Face Spoofing Attacks”. In: *IAPR International Conference on Biometrics (ICB)*. 2013.
- [197] T.F. Pereira, A. Anjos, J.M. Martino, and S. Marcel. “Can face anti-spoofing countermeasures work in a real world scenario?” In: *IAPR International Conference on Biometrics (ICB)*. 2013.
- [198] R. Saeidi, K. A. Lee, T. Kinnunen, T. Hasan, B. Fauve, P.-M. Bousquet, E. Khoury, P. L. Sordo Martinez, J. M. K. Kua, C. H. You, H. Sun, A. Larcher, P. Rajan, V. Hautamäki, C. Hanilci, B. Braithwaite, R. Gonzales-Hautamäki, S. O. Sadjadi, G. Liu, H. Boril, N. Shokouhi, D. Matrouf, L. El Shafey, P. Mowlae1, J. Epps, T. Thiruvaran, D. A. van Leeuwen, B. Ma, H. Li, J. H. L. Hansen, J. -F. Bonastre, S. Marcel, J. Mason, and E. Ambikairajah. “I4U submission to NIST SRE 2012: A large-scale collaborative effort for noise-robust speaker verification”. In: *Annual Conference of the International Speech Communication Association (INTERSPEECH)*. 2013.
- [201] A. Anjos, L. El Shafey, R. Wallace, M. Günther, C. McCool, and S. Marcel. “Bob: a free signal processing and machine learning toolbox for researchers”. In: *ACM Multimedia 2012 International Conference*. 2012.
- [202] I. Chingovska, A. Anjos, and S. Marcel. “On the Effectiveness of Local Binary Patterns in Face Anti-spoofing”. In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2012.
- [203] M. Günther, R. Wallace, and S. Marcel. “An Open Source Framework for Standardized Comparisons of Face Recognition Algorithms”. In: *European Conference on Computer Vision (ECCV) - BeFIT*. 2012.
- [204] C. McCool, S. Marcel, H. Abdenour, M. Pietikainen, P. Matejka, J. Cernocky, N. Poh, J. Kittler, A. Larcher, C. Levy, D. Matrouf, J-F. Bonastre, P. Tresadern, and T. Cootes. “Bi-Modal Person Recognition on a Mobile Phone: using mobile phone data”. In: *IEEE ICME Workshop on Hot Topics in Mobile Multimedia*. July 2012.
- [205] P. Motlicek, L. El Shafey, R. Wallace, C. McCool, and S. Marcel. “Bi-Modal Authentication in Mobile Environments using Session Variability Modelling”. In: *IEEE International Conference on Pattern Recognition (ICPR)*. 2012.
- [206] T.d.F. Pereira, A. Anjos, J.M. De Martino, and S. Marcel. “LBP-TOP based countermeasure against facial spoofing attacks”. In: *International Workshop on Computer Vision With Local Binary Pattern Variants - ACCV*. 2012.
- [208] A. Roy, M-M. Doss, and S. Marcel. “Boosting Localized Binary Features for Speech Recognition”. In: *Symposium on Machine Learning in Speech and Language Processing (MLSLP)*. 2012.
- [209] L. El Shafey, R. Wallace, and S. Marcel. “Face Verification using Gabor Filtering and Adapted Gaussian Mixture Models”. In: *IEEE International Conference of the Biometrics Special Interest Group (BIOSIG)*. 2012.
- [213] A. Anjos and S. Marcel. “Counter-Measures to Photo Attacks in Face Recognition: a public database and a baseline”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2011.
- [214] M-M. Chakka, A. Anjos, S. Marcel, and al. “Competition on Counter Measures to 2-D Facial Spoofing Attacks”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2011.
- [215] J. Parris, M. Wilber, B. Helfin, H. Rara, A. El-barkouky, A. Farag, J. Movellan, M. Santana, J. Lorenzo, M.N. Teli, S. Marcel, C. Atanasoaei, and T. Boulton. “Face and Eye Detection on Hard Datasets”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2011.
- [216] A. Roy, M. M. Doss, and S. Marcel. “Fast Speaker Verification on Mobile Phone data using Boosted Slice Classifiers”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2011.
- [217] A. Roy, M.M. Doss, and S. Marcel. “Phoneme Recognition using Boosted Binary Features”. In: *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2011.
- [218] R. Wallace, M. McLaren, C. McCool, and S. Marcel. “Inter-session Variability Modelling and Joint Factor Analysis for Face Authentication”. In: *IEEE IAPR International Joint Conference on Biometrics (IJCB)*. 2011.
- [219] C. Atanasoaei, C. McCool, and S. Marcel. “A principled approach to remove false alarms by modelling the context of a face detector”. In: *Proceedings of the British Machine Vision Conference (BMVC)*. 2010, pp. 1–11.
- [222] S. Marcel, C. McCool, C. Atanasoaei, F. Tasseti, J. Pešán, P. Matějka, J. Černocký, M. Helišekangas, and M. Turtinen. “MOBIO: Mobile Biometric Face and Speaker Authentication”. In: *IEEE Conference on Computer Vision and Pattern Recognition*. 2010.
- [223] S. Marcel, C. McCool, P. Matějka, T. Ahonen, J. Černocký, S. Chakraborty, V. Balasubramanian, S. Panchanathan, C.H. Chan, J. Kittler, N. Poh, B. Fauve, O. Glembek, O. Plhot, Z. Jančík, A. Larcher, C. Lévy, D. Matrouf, J.F. Bonastre, P.H. Lee, J.Y. Hung, Y.P. Hung S.W. Wu, L. Machlica, J. Mason, S. Mau, C. Sanderson, D. Monzo, A. Albiol, H.V. Nguyen, L. Bai, Y. Wang, M. Niskanen, M. Turtinen, J.A. Nolzco-Flores, L.P. Garcia-Perera, R. Aceves-Lopez, M. Villegas, and R. Paredes. “On the Results of the First Mobile Biometry (MOBIO) Face and Speaker Verification Evaluation”. In: *Proceedings of the ICPR 2010 Contests*. 2010, pp. 210–225.

-
- [224] S. Marcel and Y. Rodriguez. “Torchvision the machine-vision package of Torch”. In: *ACM Multimedia 2010 International Conference*. 2010, pp. 1485–1488. DOI: [10.1145/1873951.1874254](https://doi.org/10.1145/1873951.1874254).
- [227] N. Poh, J. Kittler, S. Marcel, D. Matrouf, and J.-F. Bonastre. “Model and Score Adaptation for Biometric Systems: Coping With Device Interoperability and Changing Acquisition Conditions”. In: *IEEE International Conference on Pattern Recognition*. (Best Scientific Paper Award). 2010, pp. 1229–1232.
- [228] A. Roy, M. M. Doss, and S. Marcel. “Boosted Binary Features for Noise-Robust Speaker Verification”. In: *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2010, pp. 4442–4445.
- [229] A. Roy and S. Marcel. “Crossmodal Matching of Speakers using Lip and Voice Features in Temporally Non-overlapping Audio and Video Streams”. In: *IEEE International Conference on Pattern Recognition*. 2010, pp. 1051–1056.
- [230] A. Roy and S. Marcel. “Introducing Crossmodal Biometrics: Person Identification from Distinct Audio and Visual Streams”. In: *IEEE Fourth International Conference on Biometrics: Theory, Applications and Systems*. 2010, pp. 1–6.
- [231] A. Roy and S. Marcel. “Visual processing-inspired Fern-Audio features for Noise-Robust Speaker Verification”. In: *ACM 25th Symposium on Applied Computing, 2010, Sierre, Switzerland*. Association for Computing Machinery. 2010, pp. 1491–1495.
- [232] V. Subburaman and S. Marcel. “An Alternative Scanning Strategy to Detect Faces”. In: *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. 2010, pp. 2122–2125.
- [233] V. Subburaman and S. Marcel. “Fast Bounding Box Estimation based Face Detection”. In: *Workshop on Face Detection of the European Conference on Computer Vision (ECCV)*. (Best Paper Award). 2010.
- [234] J. Galbally, C. McCool, J. Fierrez, S. Marcel, and J. Ortega-Garcia. “Hill-Climbing Attack to an Eigenface-Based Face Verification System”. In: *Proceedings of the International Conference on Biometrics, Identity and Security (BIDS)*. 2009, pp. 1–6.
- [235] G. Heusch and S. Marcel. “Bayesian Networks to Combine Intensity and Color Information in Face Recognition”. In: *IEEE IAPR International Conference on Biometrics (ICB)*. 2009, pp. 414–423.
- [237] S. Marcel, R. van Zwol, R. Baeza-Yates, O. Heckmann, J.E. Solem, J. Oomen, H. van Gageldonk, J.-P. Gehrig, X. Vives, and B. Sumengen. “Media on the Web, in Post-Production and Broadcasting”. In: *ACM Intl. Conf. On Image and Video Retrieval (CIVR)*. 2009, pp. 1–21.
- [238] C. McCool and S. Marcel. “Parts-Based Face Verification using Local Frequency Bands”. In: *IEEE IAPR International Conference on Biometrics (ICB)*. 2009, pp. 259–268.
- [239] Norman Poh, Chi-Ho Chan, Josef Kittler, Sébastien Marcel, Christopher Mc Cool, Enrique Argones-Rúa, José Luis Alba-Castro, Mauricio Villegas, Roberto Paredes, Vitomir Struc, Nikola Pavesic, Albert Ali Salah, Hui Fang, and Nicholas Costen. “Face Video Competition”. In: *Advances in Biometrics, Third International Conference, ICB 2009, Alghero, Italy, June 2-5, 2009. Proceedings*. Vol. 5558. Lecture Notes in Computer Science. Springer, 2009, pp. 715–724. DOI: [10.1007/978-3-642-01793-3_73](https://doi.org/10.1007/978-3-642-01793-3_73).
- [240] A. Roy and S. Marcel. “Haar Local Binary Pattern Feature for Fast Illumination Invariant Face Detection”. In: *Proceedings of the British Machine Vision Conference (BMVC)*. 2009.
- [241] G. Heusch and S. Marcel. “Face Authentication with Salient Local Features and Static Bayesian Network”. In: *IEEE IAPR International Conference on Biometrics (ICB)*. 2007.
- [242] S. Marcel. “Joint Bi-Modal Face and Speaker Authentication using Explicit Polynomial Expansion”. In: *Proceedings of the Workshop on Multimodal Interaction and Related Machine Learning Algorithms (MLMI)*. 2007.
- [245] M. Al-Hames, T. Hain, J. Cernocky, S. Schreiber, M. Poel, R. Muller, S. Marcel, D. van Leeuwen, J. Odobez, S. Ba, H. Boulard, F. Cardinaux, D. Gatica-Perez, A. Janin, P. Motlicek, S. Reiter, S. Renals, J. van Rest, R. Rienks, G. Rigoll, K. Smith, A. Thean, and P. Zemcik. “Audio-Visual Processing in Meetings: Seven Questions and Current AMI Answers”. In: *Proceedings of the Workshop on Multimodal Interaction and Related Machine Learning Algorithms (MLMI)*. 2006.
- [246] G. Heusch, Y. Rodriguez, and S. Marcel. “Local Binary Patterns as an Image Preprocessing for Face Authentication”. In: *IEEE International Conference on Automatic Face and Gesture Recognition (AFGR)*. 2006.
- [247] A. Just, Y. Rodriguez, and S. Marcel. “Hand Posture Classification and Recognition using the Modified Census Transform”. In: *IEEE International Conference on Automatic Face and Gesture Recognition (AFGR)*. 2006.
- [248] S. Marcel, J. Mariéthoz, Y. Rodriguez, and F. Cardinaux. “Bi-Modal Face and Speech Authentication: a BioLogin Demonstration System”. In: *Workshop on Multimodal User Authentication (MMUA)*. 2006.
- [249] K. Messer, J. Kittler, J. Short, G. Heusch, F. Cardinaux, S. Marcel, Y. Rodriguez, and al. “Performance characterization of face recognition algorithms and their sensitivity to severe illumination changes”. In: *International Conference on Biometrics (ICB)*. 2006.
- [250] Y. Rodriguez and S. Marcel. “Face Authentication Using Adapted Local Binary Pattern Histograms”. In: *9th European Conference on Computer Vision (ECCV)*. 2006. DOI: [10.1007/11744085_25](https://doi.org/10.1007/11744085_25).
- [251] A. Just, O. Bernier, and S. Marcel. “HMM and IOHMM for the Recognition of Mono- and Bi-Manual 3D Hand Gestures”. In: *Proceedings of the British Machine Vision Conference (BMVC)*. 2004.
-

-
- [252] A. Just, O. Bernier, and S. Marcel. “Recognition of Isolated Complex Mono- and Bi-Manual 3D Hand Gestures”. In: *Proceedings of the 6th International Conference on Automatic Face and Gesture Recognition (AFGR)*. 2004.
- [253] A. Just, S. Marcel, and O. Bernier. “Recognition of Isolated Complex Mono- and Bi-Manual 3D Hand Gestures using Discrete IOHMM”. In: *Proceedings of the Workshop on Multimodal Interaction and Related Machine Learning Algorithms (MLMI)*. 2004.
- [254] S. Marcel. “A Symmetric Transformation for LDA-based Face Verification”. In: *Proceedings of the 6th International Conference on Automatic Face and Gesture Recognition (AFGR)*. 2004.
- [256] S. Marcel and J. Ferryman. “Observing People Interacting in Meetings: Introduction to Dataset”. In: *IEEE International Workshop on Performance Evaluation of Tracking and Surveillance (PETS-ICVS)*. 2004.
- [257] S. Marcel and Y. Rodriguez. “Biometric Face Authentication using Pixel-based Weak Classifiers”. In: *Proceedings of the Biometric Authentication Workshop (BIOAW)*. Prague, Czech Republic, May 2004.
- [258] K. Messer, J. Kittler, M. Sadeghi, M. Hamouz, A. Kostyn, S. Marcel, S. Bengio, F. Cardinaux, C. Sanderson, N. Poh, Y. Rodriguez, J. Czyz, and al. “Face Authentication Test on the BANCA Database”. In: *Proceedings of the International Conference on Pattern Recognition (ICPR)*. Cambridge, Aug. 2004.
- [259] K. Messer, J. Kittler, M. Sadeghi, M. Hamouz, A. Kostyn, S. Marcel, S. Bengio, F. Cardinaux, C. Sanderson, N. Poh, Y. Rodriguez, K. Kryszczuk, J. Czyz, L. Vandendorpe, J. Ng, H. Cheung, and B. Tang. “Face Authentication Competition on the BANCA Database”. In: *Proceedings of the International Conference on Biometric Authentication (ICBA)*. Hong Kong, July 2004.
- [260] V. Popovici, J.P. Thiran, Y. Rodriguez, and S. Marcel. “On Performance Evaluation of Face Detection and Localization Algorithms”. In: *Proceedings of the International Conference on Pattern Recognition (ICPR)*. Cambridge, UK, Aug. 2004.
- [261] F. Cardinaux, C. Sanderson, and S. Marcel. “Comparison of MLP and GMM Classifiers for Face Verification on XM2VTS”. In: *Proceedings of the 4th International Conference on Audio- and Video-based Biometric Person Authentication (AVBPA)*. University of Surrey, Guildford, UK, June 2003.
- [262] N. Poh, S. Marcel, and S. Bengio. “Improving Face Authentication Using Virtual Samples”. In: *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. Vol. 3. 2003, pp. 233–236.
- [264] S. Marcel and S. Bengio. “Improving Face Verification using Skin Color Information”. In: *Proceedings of the 16th International Conference on Pattern Recognition (ICPR)*. Vol. 2. IEEE Computer Society Press, 2002, pp. 378–381.
- [266] S. Marcel, O. Bernier, J.-E. Viallet, and D. Collobert. “Hand gesture recognition using Input-Output Hidden Markov Models”. In: *Proceedings. Fourth IEEE International Conference on Automatic Face and Gesture Recognition*. 2000, pp. 456–461.
- [267] S. Marcel. “Hand posture recognition in a body-face centered space”. In: *Conference on Human Factors in Computing Systems*. CHI. ACM, 1999, pp. 302–303.