



HUMAN & MEDIA COMPUTING

ADVISORY BOARD 2011





Foreword from the Director



The Idiap Research Institute is an independent, nonprofit, research institute located in Martigny, Switzerland. Affiliated with the Ecole polytechnique fédérale de Lausanne (EPFL) and the University of Geneva, Idiap is primarily funded by the Federal Government, the State of Valais, and the City of Martigny.

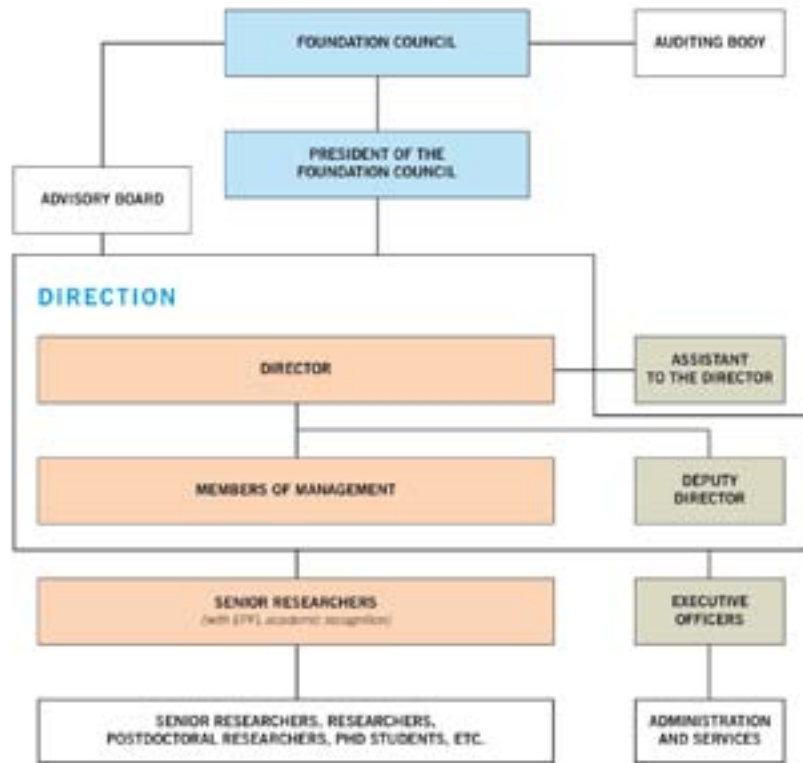
Spanning basic research, training (including teaching and PhD students) and technology transfer, Idiap's activities cover the fields of machine learning, speech and audio processing, computer vision, multimedia content structuring and access, biometric authentication, and multimodal interaction. Recognized as a center of excellence in these areas, Idiap is involved in numerous national and international (EU and US) projects, as well as in multiple collaborative projects with industries. At the national level, Idiap is also the "Leading House" of the National Center of Competence in Research (NCCR) on "Interactive Multimodal Information Management (IM2)". To support its constant growth and ambition to

maintain the highest quality of research, Idiap has recently endowed itself with a high-level International Advisory Board, which primary mission is to provide advice to Idiap's management on research orientations, technology transfer issues, ways to foster quality and visibility of the institute, while also boosting the potential for international collaboration. On behalf of Idiap I am happy to welcome the current members of the Idiap Advisory Board, who kindly accepted our invitation to join our team. We are particularly proud to count on this group of very high level scientists, all recognized at the international level for their achievement in research and technology transfer management.

Prof. Hervé Bourlard
September 2011



Organizational Chart

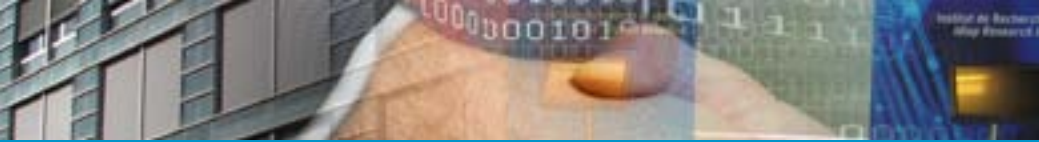


■ The Scientific Board, comprised of all the professors and senior lecturers (WPI), ensures the scientific management of Idiap, particularly regarding recruitment, positioning, and partnerships.

■ The Administrative Board is comprised of finance, human resources, institutional relations and public relations managers, as well as project, infrastructure and IT managers.

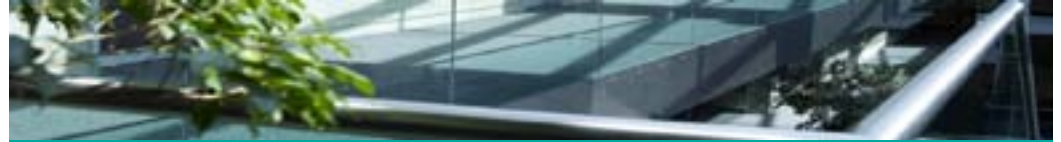
Advisory Board 2011

- Dr. Jordan Cohen
Independent Consultant, SPELAMODE
- Prof. Dr. Donald Geman
Professor of Mathematics, Johns Hopkins University, Baltimore
- Dr. John Makhoul
Chief Scientist, Speech and Signal Processing, BBN Technologies, Cambridge
- Prof. Dr. Nelson Morgan
Director of the International Computer Science Institute (ICSI), Berkley
- Dr. David Nahamoo
Senior Manager, IBM Research, Yorktown Heights
- Prof. Gerhard Sagerer
Rector, Bielefeld Universität
- Dr. Roelof van Zwol
Senior Research Scientist, Multimedia, Audience Sciences, Yahoo! Research, Santa Clara
- Prof. Dr. Bayya Yegnanarayana
Professor and Microsoft Chair, International Institute of Information Technology (IIIT) Hyderabad



Former members

- Prof. Dr. Christopher Bishop
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- Prof. Dr. James Flanagan
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Director, Media Information Science Laboratories, ATR, Kyoto, Japan
- Prof. Dr. Alex Pentland
Director of the Human Dynamics Research, Media Laboratory MIT
- Prof. Dr. Steve Young
Head of Information Engineering Division, Cambridge University
- Dr. Hong-Jiang Zhang
Managing Director, Microsoft Research Asia Advanced Technology Center



Dr. Jordan Cohen

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Jordan Cohen is an independent consultant at SPELAMODE, a small company specializing in Speech, Language, and Mobile Devices. He was previously a Senior Scientist at SRI International, where he served as the Principal Investigator for the DARPA GALE program for SRI, coordinating the activities of 14 subcontractors to harness speech recognition, language translation, and information annotation and distillation resources for the government.

Jordan received his PhD in Linguistics from the University of Connecticut, preceeded by a Masters' Degree in Electrical Engineering

from the University of Illinois. He has worked in the Department of Defense, IBM, and at the Institute for Defense Analyses in Princeon, NJ. Jordan was the CTO of Voice Signal Technologies, a company which produces multimodal speech-centric interfaces for mobile devices. He is a member of the Acoustical Society of America and the IEEE, and has published in both the classified and unclassified literature of speech and language technologies.



Prof. Dr. Donald Geman

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Donald Geman received a B.A. degree in Literature from the University of Illinois and a Ph.D. in Mathematics from Northwestern University. He was Distinguished Professor at the University of Massachusetts until 2001, when he joined the Department of Applied Mathematics and Statistics at The Johns Hopkins University, where he is now a member of the Center for Imaging Science and the Institute for Computational Medicine.

His main research areas are statistical learning, computer vision and computational biology. Current projects include semantic scene interpretation, mental image retrieval, molecular cancer diagnosis and modeling protein-protein interaction networks. He has supervised over twenty Ph.D. students spanning research in image processing, stochastic modeling, machine learning and computational biology.

According to the ISI, he is among the one hundred most cited authors in Engineering. His 1984 paper «Stochastic relaxation, Gibbs distributions and the Bayesian restoration of images,» which introduced the Markov Random Field framework for image analysis and the Gibbs Sampler algorithm, has been especially influential. Other contributions include randomized decision trees, later known as «Random Forests», «half-quadratic» regularization for image reconstruction, and a «twenty questions» or «coarse-to-fine» approach to pattern recognition.

Recently, he and co-workers at Johns Hopkins have developed a new approach to molecular cancer detection and treatment prediction, recently shown to be effective in distinguishing between gastrointestinal cancers and in predicting the response to new drugs in acute myeloid leukemia.

Dr. John Makhoul

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John Makhoul, a Chief Scientist at BBN Technologies, has been working on various aspects of speech and language processing, including speech coding, speech synthesis, speech recognition, speech enhancement, speaker recognition, artificial neural networks, digital signal processing, optical character recognition, language understanding, information retrieval and extraction, speech-to-speech translation, human-machine interaction using voice, and more recently, machine translation. At BBN, he is also Director of the Science Development Program, which promotes the professional development of the staff and encourages publications and patents.

He is also an Adjunct Professor at Northeastern University, where he supervises graduate students who do their M.S. and Ph.D. thesis work at BBN in the area of speech and language processing. He has served as a member of several panels of the U.S. National Research Council and chaired panels in the areas of speech recognition and

speech enhancement. He has also served on several committees of the IEEE Signal Processing Society and was on the Editorial Board of the Speech Communication journal.

Makhoul is a Fellow of the IEEE and of the Acoustical Society of America. He is the recipient of the 1978 Best Paper Award, the 1982 Technical Achievement Award, and the 1988 Society Award of the IEEE Signal Processing Society. In 2000, he was awarded the IEEE Third Millennium Medal, and in 2009, he was the recipient of the IEEE James L. Flanagan Award for his “pioneering contributions to speech modeling.”

Makhoul received the B.E. degree from the American University of Beirut in 1964, the M.Sc. degree from the Ohio State University in 1965, and the Ph.D. degree from the Massachusetts Institute of Technology in 1970, all in electrical engineering.

Prof. Dr. Nelson Morgan

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Nelson Morgan is the Director of the International Computer Science Institute (ICSI), an independent not-for-profit research laboratory that is closely affiliated with UC Berkeley.

In addition to directing the Institute he has led the Speech Group (formerly called the Realization Group) at ICSI since 1988. He is also a Professor-in-residence in the EECS Department at the University of California at Berkeley, where he received his Ph.D. as an NSF Fellow in 1980.

He has been working on problems in signal processing and pattern recognition since 1974, with a primary emphasis on speech processing. He may have been the first to use neural networks for speech classification in a commercial application, and to incorporate time-frequency distributions for event-related potentials (brain waves).

He is a Fellow of the IEEE, a former Editor-in-chief of Speech Communication, (and current Editorial Board member) and a former (and now returning) member of the IEEE Speech Technical Committee. In 1997 he received the Signal Processing Magazine best paper award.

Professor Morgan has been the US representative on a number of collaborations with European researchers, including several European Union projects. As Director (since 1999), he is responsible for ICSI's visitor programs with other countries, particularly Finland, Spain, Germany, and Switzerland. He is also on a number of Advisory Boards for organizations other than IDIAP: the Excellence Cluster on Multimodal Computing and Interaction in Saarbruecken, Germany; the International Speech Communication Association (ISCA); and two commercial companies, Vox Learning and Sensory, Inc.

Professor Morgan has roughly 200 publications including three books; his most recent book is a text (written jointly with Ben Gold) on speech and audio signal processing. He holds a number of patents in speech processing methods, including one that has been used in millions of CDMA cell phones.

His current research interests include the redesign from first principles of the primary signal processing used in speech recognition systems, and the use of neural networks for the design of these new features.

Dr. David Nahamoo

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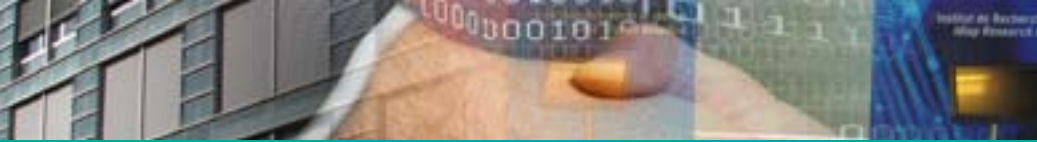
David Nahamoo is responsible for IBM Research efforts in the conversational and multimodal technologies. He is also responsible for delivering these technologies to IBM Divisions for product delivery in desktop, embedded, and server areas. He joined IBM Research in 1982 as a Research Staff Member. Since then he has held a number of positions in the organization including Manager, Speech Recognition Modeling and Interim General Manager, Speech Business Unit. In 1993, he was appointed Senior Manager of the Human Language Technologies Group, of which he became the Department Group Manager in 1998. In 2006, he was appointed as the Speech CTO at IBM Research. He currently leads a team of 60 people at IBM Watson Research Centers in Yorktown Heights, New York and a team of 20 people in Prague. He provides technical direction for Conversational and Multimodal Interaction Technologies at IBM Research labs worldwide.

He holds 25 patents and has published more than 55 technical papers in scientific

journals. He has also been very active in the popular and trade press as well as on TV and radio with more than 100 interviews.

Dr. Nahamoo is a Member of IBM Academy, a Member of The Johns Hopkins CLSP Advisory Council, and a Fellow of the IEEE. He has also been a Member of the Spoken Language Coordinating Committee, DARPA, and of the Speech Technical Committee of the ASSP Society as well as the Associate Editor of Transactions on Acoustics, Speech and Signal Processing. In 2001, he received the IEEE Signal Processing Best Paper Award. His current research interests include conversational and multimodal technologies and tools, and user interface middleware.

David Nahamoo received a B.S. degree from Tehran University, Iran, an M.S. from Imperial College of London, England, and his Ph.D. in 1982 from Purdue University in Indiana; all of his studies were in electrical engineering.



Prof. Dr. Gerhard Sagerer

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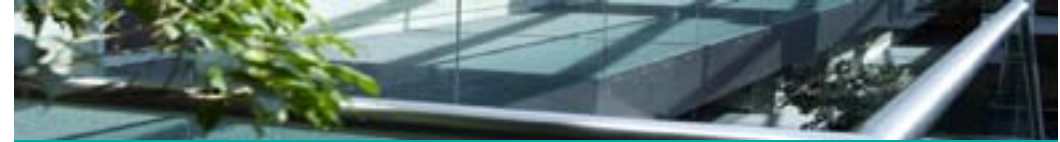


Gerhard Sagerer was born in Ludwigshafen in 1956. He received his diploma and Ph.D. (Dr.-Ing.) degree in computer science from the University of Erlangen-Nürnberg, Erlangen, Germany, in 1980 and 1985, respectively. In 1990 he received the *venia legendi* (Habilitation) in computer science from the Faculty of Technology of this university. From 1980 to 1990 he worked with the research group for pattern recognition (Institut für Informatik, Mustererkennung) at the University of Erlangen-Nürnberg, Erlangen, Germany. 1989/1990 he was temporary manager of the Bavarian Research Center for Knowledge-Based Systems (FORWISS). In 1990 he was appointed professor of computer science at Bielefeld University, Germany, where he headed the research group for Applied Computer Science (Angewandte Informatik) until 2009. In 1996 he was a visiting professor at the Computer Science Department at the University of Rochester, NY, USA.

From 1991 to 1993 Gerhard Sagerer was a member of the academic senate of Bielefeld university. From 1993 to 1995 and from 1997 to 2001 he was dean of the Faculty of Technology. In 2001, he became vice-rector for education, study affairs, and further education, a position which he held for 6 years, until 2007. From 2003 to 2007

he was permanent deputy of the Rektor of Bielefeld University. From 1993 to 2005 Gerhard Sagerer was a project manager in the Collaborative Research Center (CRC) 360 „Situierete Künstliche Kommunikatoren“, as well as from 2006 to 2010 in the CRC 673 „Alignment in Communication“. He was also coordinator or member of the scientific board of several EU projects, such as VAMPIRE (2003 – 2007), COGNIRON (2004 – 2008), or ITALK (since 2008). Since 2007, Gerhard Sagerer has been director at the Research Institute for Robotics and Cognition (CoR-Lab), which forms a strategic partnership with the industrial partner Honda Research Institute Europe GmbH (HRI-EU).

From 2007 to 2009 Gerhard Sagerer was also vice-coordinator of the Centre of Excellence Cognitive Interaction Technology (CITEC), a research institute aiming at developing technical systems, in particular social robots that are capable of learning and adapting to human users. Gerhard Sagerer's fields of research are social cognitive robotics, human-robot interaction, computer vision, speech and dialogue systems, architecture of intelligent systems, memory and learning for cognitive systems, and evaluation of complex systems. Since 2009, Gerhard Sagerer has been Rector of Bielefeld University.



Dr. Roelof van Zwol

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Dr. Roelof van Zwol joined Yahoo! Research as a senior research scientist in 2006, where he is now managing the multimedia research team in California, USA. He has more than 10 years of international research experience in multimedia, information retrieval, (social) media mining, object ranking, spatial search, XML, databases, and machine learning. He is passionate about conducting research in an industrial context and to apply the outcomes in high-impact end-user services. His research on object ranking powers the left-rail search suggestions in Yahoo!'s Web and image search engine.

Prior to joining Yahoo he was an assistant professor at Utrecht University in the Netherlands working on spatial information retrieval, multimedia and xml retrieval. He received his Ph.D. in Computer Science in 2002 from the University of Twente in the Netherlands on the topic of modeling and searching multimedia document collections.

He obtained his M.Sc. degree from the University of Twente in 1998 on the topic of generalization of spatial data.

Roelof van Zwol is the author of more than 65 peer reviewed publications, a number of which appeared in first-tier conferences such as WWW, ACM Multimedia, and SIGIR. He holds 3 patents, and has over 25 patents pending. He is an active member of the research community, who serves on the PC of conferences such as SIGIR, WWW, ACM Multimedia, CIVR, and ICMR. He was co-chair of CIVR in 2009, and organizer of the second conference on Multimedia Search, as well as the organizer of 6 workshops themed around Web search, multimedia, social media and information retrieval. In European context, he was the technical coordinator of the Semedia EU project on search environments for Media, and project manager in the WeKnowIt EU project.





Prof. Dr. Bayya Yegnanarayana

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Prof. Yegnanarayana is a professor and Microsoft Chair at the International Institute of Information Technology (IIIT) Hyderabad. Prior to joining IIIT, he was a professor in the Dept of Computer Science and Engineering at the Indian Institute of Technology (IIT) Madras, India, from 1980 to 2006. He was the chairman of the department from 1985 to 1989. He was a visiting associate professor of Computer Science at the Carnegie-Mellon University, Pittsburgh, USA from 1977 to 1980. He was a member of the faculty at the Indian Institute of Science (IISc), Bangalore, from 1966 to 1978.

He did BSc from Andhra University, Waltair (India) in 1961, and BE, ME and PhD (all in Electrical Communication Engineering) from IISc Bangalore (India), in 1964, 1966, and 1974, respectively.

His research interests are in signal processing, speech, image processing and neural networks. He has published over 300

papers in these areas in IEEE and other international journals, and in the proceedings of national and international conferences. He is also the author of the book «Artificial Neural Networks», published by Prentice-Hall of India in 1999. He has supervised 25 PhD and 31 MS theses.

He was an Associate Editor for the IEEE Transactions on Speech and Audio Processing from 2003 to 2006. He is a Fellow of the Indian National Academy of Engineering, a Fellow of the Indian National Science Academy, and a Fellow of the Indian Academy of Sciences. He was the recipient of the 3rd IETE Prof.S.V.C.Aiya Memorial Award in 1996. He received the Prof.S.N.Mitra memorial Award for the year 2006 from the Indian National Academy of Engineering for his significant and unique contributions in speech processing applications, and for pioneering work in teaching and research in signal processing and neural networks.



Portrait

From its base in Martigny (Valais/ Switzerland) the non-profit Idiap Research Institutes is specialised in the management of multimedia information and man-machine multimodal interactions.

The Idiap Research Institute was founded in 1991 by a collaborative effort among the Town of Martigny, the State of Valais, the Ecole polytechnique fédérale de Lausanne (EPFL), the University of Geneva and Swisscom. It is autonomous but connected, via a joint development plan, to EPFL.

Sixty percent of Idiap's annual budget of more than nine million francs is financed by

research projects competitively awarded, and forty percent by public funds.

From having employed only about thirty people in 2001, Idiap has grown by 2010 to more than one hundred employees, including eighty researchers (professors, senior researchers, researchers, postdoctoral students and PhD students).

All the personnel work in the west wing at Centre du Parc in Martigny, after moving there in August 2007. Idiap now occupies 2,600 m² on four floors.



Research areas

Idiap's main research areas are the following:

- **Perceptual and cognitive systems**
(speech processing / natural language understanding and translation / document and text processing / vision and scene analysis / multimodal processing / cognitive sciences)
- **Social and human behaviour**
(web social media / mobile social media / social interaction sensing / social signal processing / verbal and nonverbal communication analysis)
- **Information interfaces and presentation**
(multimedia information systems / user interfaces / system evaluation)
- **Biometric user authentication**
(speaker identification and verification / face detection, identification and verification / multimodal biometric user authentication)
- **Machine learning ML**
(statistical and neural network based ML / computational efficiency, targeting real-time applications / very large datasets)

More information:

<http://www.idiap.ch/scientific-research>



Identity card of Idiap Research Institute

Objectives

Activities at Idiap pursue three main objectives:

- Conduct fundamental research projects at the highest level, thus taking its place among the best on a national, European and global scale. Idiap benefits from a wide network of international partners and work collaboratively with, for example, large universities, and public and private research centres.
- Help interns discover the world of research and thereby foster their recruitment. Idiap welcomes talented young researchers working on their PhD by providing a number of courses at EPFL and in-house.
- Ensure technology transfer not only through the widest possible dissemination of its research results into the scientific community, but also by forging close ties with the world of industry.

Geographical situation

The Idiap Research Institute is in Martigny, one of the main towns of the Canton of Valais, in the French-speaking part of Switzerland, in the south of the country. In the heart of the Alps, Valais has an exceptional landscape and a pleasant microclimate, which makes it a very popular tourist destination and a very sought-after place to live.

Martigny is a town of approximately 15,000 inhabitants and is situated close to Montreux, Lausanne and Lake Geneva. Geneva airport is 90 minutes away by train. Martigny is well positioned in the centre of Europe.





Idiap in figures

Human resources (average over the past few years)

- 2 professors
- 3 senior lecturers (MER)
- 10 permanent researchers
- 15 postdoctoral researchers
- 38 PhD students
- 8 development engineers
- 6 system engineers
- 16 interns and visitors per year
- 39 positions in start-ups on the IdeArk site
- 10 administrative employees
- 29 nationalities represented

Scientific activities

- IM2 National Centre of Competence in Research (interactive and multimodal management of information systems) since 2001
- Participation in 39 research programmes
- Project management in 9 consortiums
- Participation in the economic development strategy of the Canton of Valais through The Ark programme and in particular the IdeArk company
- An average of 100 high-level publications per year - <http://publications.idiap.ch/>
- Participation in numerous international conferences





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