Vision day News

Technology section *September 2015*

From the editors

In preparation for September 4th and 5th 2006, please write a short article, (maximum 500 words on one A4 page), that you would hope to see in the technology section of a major newspaper in the year 2015 about our research.

Use your imagination, experience, hopes and fears. You can focus on what you're doing today, or go beyond that to what you think you, and others, could be working on over the next 7 years. Be thoughtful, but also think big. Write it from any angle you wish, but imagine someone in the year 2015, reading this article. What would you like them to see?

We will share all these articles within the group, and use them as a foundation for our research visions.

In this issue

We're Halfway There

David Barber (Technology Correspondent, The Grauniad).

29.08.2015

Today marks a milestone in the history of human technical achievement – according to WOT, the World Organisation on Technology, over 50% of the world's population now has access to a computer which is essentially permanently online. Whereas 10 years ago, access to computers was limited to a small fraction of the globe, currently China, India, North America, Europe and Russia, and large parts of Asia are permanently online. Despite these impressive achievements, the list, however, does not yet include large parts of Africa and South America. I asked Mr Manley Flinch from MacroHard consultants to assess the most striking changes that have occurred over the last 10 years, and how they affected our world today:

> "One of the largest impacts on working life has been the continued increase in out-sourcing of work as larger parts of the world moved from a manufacturing to a service society. This was aided by improved communications and the growth in a vast pool of available online labour. Nevertheless, I would say that we're still in a transition phase. For instance much remote security monitoring is now done by people in poor countries – basically just cheap human labour. It's clear that it's communications rather than computer power/technology which has had the biggest impact over the last 10 years in that respect. We're still a long way from automated speech processing and language understanding since in the mid-term, communications means it's easier to get this done by a cheap human than to solve the difficult technological challenges of human-computer interfacing."

As we all know, this transition has not been without its difficulties, particularly in Europe:

> "After the 2013 French revolution, everything changed. The desire to protect the old ways and maintain security into old age polarised society in France. The mistake that people constantly make, throughout history, is to attempt to maintain the status quo. Society and politicians need to learn to embrace change as a deep rooted human desire, whilst at the same time solidifying the basic securities that people expect in an increasingly wealthy society."

Easier said than done, perhaps. With this flexibility in the labour market, the old system of cash based payments clearly was clearly doomed:

> "The effective end of cash in 2012 was a major milestone. Everything now is just numbers! Cryptography has enabled everyone to make payments real easy and to prove that a payment has been made. The PayCrypt™ system was an invention of pure genius – this did away with money virtually overnight."

Whilst technology has clearly resulted in major social implications, not all of them have been detrimental:

> "For sure! The dramatic expansion of education was awesome. Both the Virtual Campus technology and Virtual work place have empowered access. Now the world really has access to a vast resource of talented people out there. Several fundamental mathematical challenges have been solved, as have the challenges in theoretical physics. This was really to do with opening up the world, and giving people a chance."

Whilst now commonplace, it's hard to imagine how rigid were the ideas of the working place even only ten years ago:

> "Sure. With the idea of virtual teams of extremely talented people from around the world to solve challenging tasks, the idea of rigid affiliations to a university/company became less relevant. The smart kids now are making a killing since their talents are readily accessible, and everyone knows their contributions. Similarly, management has radically changed from getting the best out of your team to being smart at quickly assembling the right virtual team. "

Paradoxically, perhaps, increased virtual communication is ultimately behind the new cafe-culture.

> "A key point that futurologists missed is that people still like to meet face to face. Technology can facilitate this, but not replace it totally. People may now be able to work from anywhere, but they still crave their daily real social interaction. That's where the cafe-culture came in. Now StarCafe claims that over 30% of the workforce work from its cafe's, mainly thanks to it's super high band width and great coffee!"

Whilst difficult to imagine now, clearly one of the major has been in the media:

> "It's funny to think back about it now. In the old days, the BBC had what, like a 1000 cameras or something. Now almost everybody has a camera. Media changed from filming it to sifting through the vast quantity of available material to quickly pull together what might be of interest, such as achieved by the Internet Broadcasting Corporation. Some people thought that personalised news would spell the end of news corporations, but what the futurologists got wrong was the point that people like to know what everybody else knows!"

The pace of change has been impressive, although many other problems remain. I asked Manley Flinch what are the main challenges he sees in the future:

> "With the current excitement about the Lunar Programme, on a much longer timescale, the ultimate limitation is the speed of light. In the future, people will view communication which can be essentially real-time to be the limits of true social interaction. This is easily achieved on an earthwide basis. Hence, in the future, any intra-earth connections will be perceived as essentially 'real', and only those for which the delays of limited light speed will appear 'unreal' ".

So much for communication, but what about the revolution that we all are waiting for in terms of human-computer interfacing:

> "Progress in that area has been disappointing. Only recently can we realistically expect to make progress in machine understanding of its environment – this just requires a huge amount of processing power compared to what was previously available. In the meantime, communications just rushed ahead regardless – not to mention the current excitement about genetically adapting organisms to perform human-like tasks. I think we're getting there in terms of true human-machine interaction, but I wouldn't hold my breath. We're certainly not even close to being halfway there yet!"

In 2015, 8 out of 10 European will have his personal on-line profile

Valérie Bauwens

Today, Virtual Private Spaces are booming. MySpace.com claims to gather 75 million users and 200‘000 new users daily. To have an on-line profile is becoming as common as having a postal address.

Now there is the possibility of creating different types of online profile suitable to different life stages and objectives.

- Mating and making friends for teenagers – e.g. MySpace, Tillate
- Professional networking – e.g. LinkedIn
- Expressing creative skills – YouTube, CreativeCommons
- Expressing opinions - Blogs
- Family memoirs and networking – e.g. yahoo360

The variety of these tools will go on growing and everyone will find the provider and service that he will be able to identify with and that will suit his communication needs. The simplification of tools to create a web presence and the interactivity of the new pages, will make it widely accessible to have an online profile. Privacy issues will also be solved with the emergence of more secure platforms and local providers.

Therefore, in 2015, 8 out of 10 European will have created his personal on-line profile. This profile will be a central communication tool for the management of everyone’s social life. It will enable people to keep in touch with people living far away but also to enrich the communication with one’s close circles of friends and family. It will make communication more fun as it will be enriched for instance by pictures, music. It will also make it more efficient through the constant usage of buddy lists but also as not only “one to one” but “one to many” communication will coexist.

A new computer paradigm enabling open innovation and full adaptability
Hervé Bourlard, Technology in Review, New York Times, September 4, 2015

For more than 30 years, operating systems have been at the center of most users' experiences with computers, often hindering or limiting their innovation potential. And, indeed, over the last two decades Microsoft's success has been due in large part to its realization that control of the operating system would give it a large amount of leverage over computers (called PCs at some point), resulting in a complete dominance of the computer industry and related applications, which later spread beyond PCs into multiple consumer devices (games, telephones, PDAs, TVs, etc).

However, as confirmed by the recent collapse of Microsoft, as well as the general feeling shared by many of us over the last 10 years, operating systems, and computer platforms in general, have now become a pure commodity product, part of it having been moved to the lower level (typically integrated over the CPU/memory chips), while the more user-centered parts have been moved to a higher level, typically a web-based platform that runs in a browser and is written in the language of the browser rather than the language of the operating system. As witnessed through the numerous applications currently being developed, this new computer paradigm has boosted "open innovation" (also including open source architectures), facilitating the convergence/integration of technologies, sharing of the tools and knowledge, and enabling the functioning of very complex systems, merging in a principled way the electronic world and the physical world, and serving the human beings to enhance their well-being directly and indirectly through what they do and what they do for other human beings. This new paradigm has abolished the obstacles to the exchange of digital media and audiovisual content between creators and customers and among users, enabling different suppliers to deploy a plethora of multimedia services that competitively coexist and interact over a common access and personal and home environment, with direct impact in multiple application areas, including consumer electronics, storage (and content engineering), radio and audio, health, social networking, etc.

Furthermore, resulting devices and applications feature easy customization and user programmability, enabling users and other non-specialist stakeholders to develop and evolve "any" system (e.g., initially a cell phone), with or without the collaboration or assistance of design experts. Such development and evolution can even go beyond tailoring or personalization of a system for an individual or a group; it might, for example, include modifications that turn out to be valuable for users not initially considered, and in situations not envisaged.

Note: As a by-product of the above, rebooting consumer electronics is no longer an option (and no longer necessary!).

Universal personal sensors are changing our everyday life
Hervé Bourlard, Technology in Review, New York Times, September 5, 2015

Society has recently witnessed the emergence of a new and more "intelligent" breed of computing systems that can relieve humans of the many burdens inherent in the use of and communication with increasingly complex systems. Such systems are now making many new applications possible, from autonomous home appliances to intelligent assistants that keep track of private and office operations, and respond to and act in the real world. Building upon advanced (open) software, reconfigurable and easily compatible hardware ("smart chips"), and integrating recent advances in perception, reasoning, representation and learning, it is now possible to deliver systems that can collaborate with many types of devices, towards interpreting, physically interacting and communicating in real-world environments to perform task-oriented and automatically adapt and expend their memory.

One example illustrating the potential of such systems is the recent emergence of personal wearable systems that can be dynamically composed out of different devices that are heterogeneous in terms of both form and function. Composition can be achieved merely via physical and "natural" proximity-based "commands" and without any explicit input commands. The system and applications adapt their functionality depending on the number and type of devices available, and peripheral devices, e.g., situated in the surrounding environment (including physical and virtual networks) are also exploited "en passant", resulting in full "personalization" of "any" device, and featuring full adaptability and learning capabilities, thus exploiting localization and user profile (taking into consideration culture, religion, etc).

Along this line, Nokia recently released a multi-purpose "Personal Sensor" (PS), which is no longer a mere telephone or a "Smart Phone/Pocket PC" but a real sensing device, which can still be used as a telephone and an agenda, of course, but which can fully exploit multiple (audio, video, GPS, etc) sensors to be fully context-aware and automatically get in tune with our daily life. This PS can indeed use multiple sources of information such as the time of operation, the location of the user, the weather, the velocity of the user, and many other environmental information to improve the capabilities and quality of the interaction between the user and services, environments, and other human beings, including, e.g.:

- Interaction between the user and services: accessing large amounts of distributed multimedia data; taking a picture, which would automatically bring you to relevant web pages; computational photography (e.g., digital photography and processing/structuring on the same device), etc
- Interaction between the user and his/her environment: when at home, the device automatically turns into a remote controller, capable of controlling your TV, and perform most functions required by home automation.
- Interaction between people. The device can be used as a recorder and "universal memory" of your social activities…

WORLDCO IN LOCKDOWN AFTER RISKOMETER TRIPPED

Staff at Worldco were locked into their offices for two hours last Monday after a device that monitors corporate risk was accidentally set off. The device, which is deployed throughout the "smart" building Worldco has occupied since late May, uses audio and video sensors to assess risk and take appropriate action for violations of everything from Worldco's social responsibility code of practice to accounting policies and health and safety legislation. The response level reached, which is the highest possible, is triggered after detecting some form of immediate and severe physical risk.

Rutger Rienks, CTO of Cotton Wool Inc., admitted the company's development team had been caught snoozing. "The sound and dialogue on computer games gets more realistic all the time, and in this case the video feed was obscured by someone standing in front of the camera, so the system couldn't see what was happening. The fact that internet gaming violates Worldco's computer use policy just tipped the balance," he remarked. The gaffe has revealed flaws in Worldco's induction procedures, since angry staff claimed to have thought the cameras were used only during remote meetings. The company is currently in emergency negotiations with Amicus, the union that represents the majority of its staff, to clarify their data protection stance.

The WorldCo building is the first workspace to have in-built risk detection, but the system is scheduled for deployment in around 100 other buildings over the next year. Although this setback could give Cotton Wool's venture capitalists cold feet, Rienks has brought a number of simpler smart office devices to market without a hitch. In 2008, he introduced the Perkomat, a coffee machine that monitors a meeting and brews automatically when a meeting is stagnating; analysts claim it can lead to productivity gains of 10% for some groups. An enhanced version, introduced in 2010, passes frozen cookie dough through an oven when sensors detect a deterioration in interpersonal relationships during a meeting. Worldco's risk detector is an adaptation of Rienks' recent foray into the childcare market with the NannyBop, a device that mixes audio capture from a bedroom or play area with music on a standard iPod to simulate the rough level of background noise, breaking in with alerts when the child's activity violates some user-settable constraints. The lockdown is estimated to have cost Worldco £7 million. Cotton Wool plans a software patch to address the issue for mid-October, but meanwhile has reset the system to turn off automatic intervention.

Jean Carletta

More and more people feel completely lost in front of a computer

IT'S EASY TO SURF ON GOOGLE, BUT FOR THE REST …..

Now, the computer is everywhere. In stores, shopping centres, restaurants, banks, post offices. Since the last human post-office cashier retired last month, you can't give your parcel to a smiling employee, after discussing the weather. And it becomes harder to find a supermarket with human cashier and a simple trolley, without this computerised shop assistant fixed on the trolley's handle, helping you to choose the right ingredients for the pre-selected recipe, and calculating the amount that will be withdrawn from your bank account when you finish shopping. And even if you are used to surf on the internet, you might feel a little bit more perplexed in front of the new TTADM (Theatre-Ticket-Automatic-Delivery-Machine) that you can now find in front of the opera house, which will give you your ticket only if it recognises your fingerprints.

When you feel comfortable with a computer, it's not a problem to live a normal life. But if you are computer-illiterate, because you missed computing class or because your teacher was not patient enough with your "unawake brain", your life is more and more complex. And nowadays, there is no longer a division between the poor and the rich. No, the only division in the population is between the ones who knows how to use a computer, and the ones who don't.

And actually, there are two different problems. On one hand, there is the ability to use the operating system that runs the computer, to find your way into this three-dimensional workplace, understanding the difference between the hyperlinks, hypolinks and paralinks. And on the other hand, it's not necessarily obvious how to use the actual device to navigate into the system, the new spongy 'deep-pad', with the three-dimensional options, and the four buttons to click on.

And like in every free-trade economic model, some parallel solutions emerged. There are those students, who, for a few quid an hour, can help you in the technology jungle. And there are also the remedial classes, that crafty people didn't wait too long to invent. But these courses bring in a good income to the teachers, and there is no guarantee that you will move your mouse more quickly afterwards.

But State Education and other authorities shouldn't wait too long, because the longer we wait, the wider the gap becomes between the ones in the know and the others. And these others can easily feel rejected, and join those new hippy communities that try to recreate the original world, in the middle of the rain forest, very far from modern technology. But maybe they are happier ?

Bruno Cartoni

Terrorist arrested by a non-invasive device able to read and interpret brainwave activity that will revolutionize our way to communicate with computers.

Sun Oct 27, 2017 11:54pm ET
By Frank Crittin

Zurich (Reuters) – An influential member of the "New Order Army" has been captured last night at the Zurich airport dealing the famous terrorist group a severe blow to its operational effectiveness. He was planning to fly to Mexico and was caught by a brand-new biometric technology that is proving highly accurate results. Once again the security domain has pushed a new technology in the spotlight. The activist had not been arrested by face recognition despite the hundreds cameras installed in the airport. Indeed, instead of classical face identification technology, Zurich airport security unit uses a revolutionary biometric brainwave analysis system enabling automatic identification of all passengers. When passengers walk up to a terminal, a device instantly scans their brainwaves, gathers biometric data and makes the identification.

Since Claude Bertillon in 1870 the "inventor" of biometry (Bertillon's system of body measurements was used in the USA to identify prisoners until the 1920s), this domain has slowly evolved. After the use of fingerprints for unique identification for nearly a century, face recognition (since its first use in January 2001, where it was in use to scan the faces of people in the crowds attending the Super Bowl) has been considered as the most non-intrusive and user-friendly biometric identification method. Even if in practice this technique has encountered some good results, it has been doomed to failure by two major drawbacks. First, even with an excellent recognition rate, the number of false alarms generated by this type of system has remained penalizing in practice. Secondly plastic surgery has been very successfully used by a new type of undesirable clients with motivations quite different than the participants of Miss World.

Due to recent developments in sensor technology, the company Unoxam has developed a remarkable system capable of measuring brainwaves remotely. This technology, based on ultrahigh impedance electric potential, provides tools for applications that are boundless. This first application of the technology in the security domain is already a success with the arrest of this activist. But very soon, the old images of people wearing headbands - used to play video games (Sony has commercialized a few years ago a head band able to induce sensory experiences such as smells, sounds, and images for video game), to drive their cars (mainly used to detect drowsiness) or to communicate with their computer (last scientific study showed that an average person is able to write at 60 words a minute directly using its brain, this is two time faster than an person writing by hand) - seem to belong to the past.

Very soon computer will be able to read an individual's thought by analyzing a combination of facial movement and brainwave activities that represent underlying feelings. Application in security is straightforward: system will not only check the identity of persons but also their intentions. MySpace, which has just bought Yahoo!, plans to introduce these technologies to allow their users to directly "annotate" content with their feelings without referring to words.

We are heading towards a new kind of interface where humans will be able to control machinery with thoughts alone. In the near future mind and computer will merge… in this perspective even with innumerable unprecedented applications that will certainly improve our life, the idea of a virus creating havoc with a human brain through such an interface could be seen as a nightmare!

No more out-of-mind !

Never been facing these uneased situations where you can't remember the place and the time you met the person in front of you ? And moreover, you can't even put a name on her/his face!

Today these awful events will no longer occur thanks to the brand new product, the « People know ».

Many years of successful research in Speech processing, forms recognition, classification and indexing in data bases allows today the development of such a product.
Thanks to all these technologies and their connections, it is now possible to have a browser which works like an automatic system of recognition of voice and image.
A data base of thousands of words and images has been created as index reference, and this data base increases day after day thanks to the users and that's one of the originality of this new product.

By itself, the data base cannot solve the problem and an electronic equipment is necessary, which consists of: a tiny camera equipped with a microphone, an auricle, and a PDA or a cell phone.
The concept of the whole system is as follows:
At the time of a meeting during which you didn't succeed in identifying your interlocutor, the camera records its image and its voice. Through the microphone, you then ask to receive informations on your interlocutor. If this one is already recorded in your base of personal data or in the base of extranet's data, then you receive the desired information directly in your auricle or on your PDA. It's like a personal card of your interlocutor, but also with informations like the last place where you met each other for example.
If your interlocutor is unknown in the system then you can record him in your personal data base using the microphone for his description or by registering him with text on your PDA. His face is automatically registered by the camera.
You can then share these informations on the extranet network in order to increase the data base.
Theses apparatuses are convenient; the camera, for exemple, can be fixed on the pocket of a shirt, on a collar or with a brooch for the ladies. All the technologies are wireless.

When science can supplement small human gaps then the cohabitation "human machine" becomes a real pleasure…

Sarah Favre

All in one

François Foglia

A Big European consortium for research announced on Friday, September 4, 2015, the birth of a new type of "Jeeves".

For years, "Jeeves" has symbolized a traditional, at-your-service butler, who makes people feel comfortable at home. In general, a butler should be able to answer any types of questions or help you in any types of tasks. Today, a new kind of "Jeeves", JeevesII, is born thanks to the hard collaborative work between some European research institutes and industries.

JeevesII is a new generation robot composed of state-of-the-art technologies. He can learn from his own experience, analyse sounds, visualise his surrounding, record everything he listens to or sees. And what's more, he is able to retrieve recorded information and show you the results on a big screen placed on his chest. Without doubt, JeevesII will soon be our inseparable robotic companion.

Built with the latest hardware, JeevesII has the high capacity to stock, to manage, to transfer data where and how you want. You can communicate with him or manage him through the net. But, he can also manage a set of tasks entirely autonomously, like returning to the base for charging.

Cameras are embedded not only in his eyes but some can be found in other strategic places on his body. These cameras allow him to move freely, search efficiently while avoiding obstacles. The cameras help him to sweep, vacuum and polish your home. No need anymore for your cleaning lady. Powerful video content analysis and image processing softwares would also increase the security level of your home. For instance, once an unusual event is detected, JeevesII can send out alerts through all possible communication means. You might also want to consider laying off your security guard!

As well as cameras, microphones are embedded in his entire body. As a result of such system, JeevesII can not only understand your instructions (biometry), but also easily detect and localize sounds. Everything is recorded. Consequently, it is possible to retrieve the conversations of your last family event or the last time you ask your robot to mow the grass. Some additional features can help handicapped people control the JeevesII' behaviour by "thinking". Electrodes, placed on the patient's head, can analyse the brain activity. Then, this activity can be translated in simple commands and transferred to the robot.

This article is clearly too short to enumerate the myriad of functions available. In short, JeevesII can replace all your domestic employees: your nanny, gardener, caretaker, and the rest. According to the consortium, new modules will soon be developed to improve or increase the competences and the functionalities of the robot. However, it can be feared that the JeevesII could be used for entirely different purposes than taking care of your home. Military departments are already willing to modify JeevesII into a war machine. It is difficult to foresee where science is able to go. Ten years were enough to create JeevesII. What if in ten years, robots would replace soldiers, bricklayers, taxi drivers and teachers? Social and economic impact of these new "Jeeves" must be thoroughly considered.

What ever the circumstances, the human being must remain the Master in the new relationship, which has been outlined, between the man and the machine.

EU Sets its Scientists Free

Phil Green

In a major funding initiative announced yesterday, European scientists will be given the freedom to follow their own research agendas rather than work to programmes devised by the EC.

The *** euro 'Framework 8' programme, to run from 2015 to 2023, will support some 2000 of Europe's best research groups with grants of up to 1M Euros per year, with no strings attached. A senior spokesman said

'Since the mid-1980s we have been trying to direct European research towards short-term aims and commercial exploitation. We have demanded collaboration across different countries, and between academia and industry. Following the success of the European research council in framework 7, we now recognise that much of this activity has been mis-directed.

Though this kind of work has its place, the effort involved in writing the complex proposals is a waste of the most valuable resource we have - the scholarship and ingenuity of our scientific community. The old-style funding will amount to no more than 10% of the framework 8 budget.

'We have made matters worse with impenetrable contracts, rigid financial arrangements and demanding reporting regimes which have left too little time for the actual research.

In framework 8 we will, on the basis of peer review, give our best research groups the means to pursue their scientific goals and to hire and train the cream of new talent. We will fund these groups well for a minimum of 5 years, subject only to informal scientific review. If there is the opportunity for exploitation we will provide support for it but we won't demand it.'

New ways to collect market surveys

Thomas Hain

In recent years a strong trend has developed, almost unseen and unnoticed by the wider public, nevertheless growing strongly: the fully automated market surveys. The traditional approach to observation of consumer, voter, etc behaviour involved the tedious search for willing participants that would answer endless questions on tastes, preferences etc. As such collection is inveitably biased, serious effort was made to get at the appropriate information. However the advances in machine learning and mulitimodal research have allowed us to make great steps towards fully automatic analysis of human behaviour.

Devices are already in use that capture visual and auditory information associated with for example the shopping behaviour in a specific part of a store without the customer even noticing that he/she is being "observed". While these devices are still simple and can only collect information on basic preferences by customers, new developments just coming out of research labs promise full and automatic analysis of spoken comments, gestures, facial expressions etc, in the same way. What is more, the market researcher can tune the device to certain issues relevant to a certain product. As the collected data is purely statistical no data protection issues arise.

Charles House
August 28, 2006

Fanciful Headline for IDIAP Conference

Intel Corporation

Dateline: September 5, 2015

Headline: International Deployment of the Interactive Adaptive Presence network (IDIAP) has been completed to 141 nations, it was announced yesterday.

Brussels. EU Leaders today released initial results of the IDIAP Impact Study, a five year assessment of the network first commissioned in 2007. The network, popular with governments and academic institutions, is now deployed in 141 nations.

Difficult topics such as Global Warming and Green Tourism have been discussed with much better analysis; governments have begun serious policy shifts as a result. Other topics – global health correlations for environmental diseases, or petroleum management, are more actionable, due to the capability for sophisticated analysis in "human terms" included in the Network.

Officials of the IDIAP Project for the EU shared some background, as well as key elements of the system. In 2006, the EU Technology Committee noted that remarkable performance/cost improvements have radically transformed such diverse areas as semiconductor chip design, 3D MRI body-scans, global seismic mapping, and weather prediction. They also observed that much of the work flow and structure of our societal infrastructure – in governments, institutions, and organizations – seemed curiously rooted in traditional approaches. The conclusion was to call for a bolder funding proposal (FP) process with the upcoming FP7 call for the start of 2007.

The call was to **Architect, Design, and Deploy a rich-media Collaboratory Network for the Research Community.** This was a bold Computer-Science-based ***"better than being there"*** capability that would enable the best researchers in any field to ***"meet virtually"*** with colleagues anywhere within the EU (and eventually around the globe), to build trust, to share applications (rather than just data), to co-design answers to significant problems, and eventually to construct vast knowledge repositories based on very quantitative analytical methods.

Another goal was to embed a deeper understanding and utilization of computationally rich data for government officials and the citizenry at large. **Thus, one piece of the vision was to stimulate much more experimenting with graphical analytical techniques.** A corollary was to teach modeling and simulation techniques behind the graphical analyses, vital to help ordinary citizens and government officials to see the impact of their assumptions.

The original system Call included an **EU-wide Collaboration Network**, with simple multi-media connections for anyone at any campus to anyone else at any other campus within the EU; **one large room and two satellite rooms** on every campus to provide highly realistic "presence", and mobile, home-based, and office interacting AV nodes able to "join" the Presence Labs; and a parallel **Peer Network Operating System**, with a "shared services" layer for a uniquely powerful interactive model for collaborators (sharing applications, not just documents). Additional elements included a **3-D Collaboration Environment**, whereby any individual serving on multiple teams with multiple projects has a highly interactive and gracefully supported environment for each project.; an **automatic archival / retrieval capability** for multi-media annotations and analysis; and finally, a repository capability, compiled as a **EU-wide Application Library**, focusing heavily on graphical interpretive tools for the Social Sciences and medicine.

Simplicity: Technology is great when it is invisible

How IDIAP contributes to make technology simpler and more meaningful.

By Pierre Ihmle August, 2015

Ten years ago, the IDIAP research institute took steps, deliberately, to make technology accessible and simpler. Results speak for themselves.

At the end of last century complexity, chaos, self-organized criticality have been some of the key words in the scientific community and in the greater public, deeply altering our understanding of our environment.

At the same time, information technology grew complex as the number of interactions increased exponentially. New avenues were opened by the Internet, mobile telephony, man-machine interactions, and networked sensors. The developed world experienced ubiquitous access to information at any time anywhere.

At the beginning of the 21st century, a powerful new trend emerged in science and business to handle complexity through simplicity. IDIAP has contributed, and continues to do so, significantly to improve information and communication technologies based on this idea. The market response is unanimous. IDIAP hatched 9 new spin-offs, 2 of them highly successful, based on the idea of simplicity.

To render man-machine interactions “simple”, IDIAP developed powerful speech, text, video, mood, gesture analysis software, and security algorithms. IDIAP’s researchers worked with cognition specialist, psychologist, biologist, designers, engineers, all sharing the same spirit of making our daily interaction with machines and technology simpler.

Some highlights. Hold your phone, it recognizes you. Your computer responds and learns from your behavior. Eye sensors track what you are looking at on your screen, while small devices behind your ears records your moods. Your GPS handheld detects geographical tags as you walk the streets. Your electronic devices are interconnected and share description of users and environments. Computers interface are simple and intuitive, and customized.

Technology is great when it is invisible. Just as with great artists in any field, dance, music, sports, a performance is beautiful when it makes you feel that it is easy. The same holds true with technology, and IDIAP made it real.

*<**attention alert active: David Johnson-Vuarraz 30/08/2015 12:00 CET**>*
<your current location is: getting into northbound train, platform 2a, train is 7 minutes delayed>
<your current attention level is: on the phone/no verbal summary/send to pocket reader>
<your current reader preference based on your current location & attention indicates you prefer the 2d "old skool" skin>

Headline1: **iSpace theft fears are over**

The curse of the modern age, iSpace theft, or the malicious take over of an individual's integrated electronic media processing space, has been beaten back. Implementation of NetID version 4.0 personal ID verification now includes 30 active and 400 passive credential points to guarantee you are indeed you.

Bringing together for the first time the DeepGPS network, commercial trust agencies, friends, colleagues and family awareness, NetTrails, MyDNA and MyHabits to confirm and guarantee your uniqueness any place, any time all the time. You can even use the Government Trust opt-out option if your elected or un-elected government does not meet your Trusting Criteria Index (TCI).

Critics have already expressed concern that the promises of NetID version 1 onwards have never been fulfilled. Criminal entities have continually found ways to insert themselves into an individual or commercial iSpace. The fact you can easily purchase stem cells from the eBay Bio-market and run up a millilitre of matched blood all for around 1000 Euros proves the weaknesses still endemic to NetID.

The NetID service, counters saying biologic testing, whilst an important TCI component, is only one of many real-time operations to protect and confirm us. Access to DNA will not allow you to grow a fingerprint, an iris or any other environment influenced factor. The strength of NetID lies in its ability to integrate multiple ID factors into a single, fast and seamless service accepted by 95% of global service providers.

A individual's iSpace allows a rich communication experience that effectively balances and directs one's attention. Integrating the telephone, video, uBlogs, extended-RSS feeds (including the biological) and all the net aware devices around us. A full resolution shared-day family party on your ultra-HDMI RealLifeSize wallpaper? A gentle force-feedback wrist watch tickle to let you know your partner is thinking of you? Your "I.know.your.teeth!" toothbrush arranging your next hygienist appointment? Project work planned to fit your blood sugar cycle? All mediated and possible through your iSpace. Your space. Your personal arbiter to the modern world.

<your current attention level has changed: off the phone/change to verbal summary/train now 15 mins delayed>

Headline2: In other news China has finally agreed to adopt the "Oil Unit" measuring index for all products produced in China. The Oil Unit or Slick as it is colloquially known, presents the consumer with a fully disclosed figure on the number of barrels of oil it takes to deliver a service or product. A litre of Beijing tap water consumes 13 slicks compared to 4 in London.

Nokia recently reduced the number of production slicks from 45 to 30 on its newest mobile interface pack by shifting 10% of its classical pre-peak oil supply chain to the growing global network of eco-balanced supply chains.

<current location indicates continuing delays: taxi has been flagged/strong suggestion to proceed to taxi/predicted delay of 8 mins for 0915 mtg, attendees informed>
<attention alert inactive: David Johnson-Vuarraz 30/08/2015 12:00 CET>

"Where is my mind?"
Towards a memory prosthesis: the electronic *Mnemonic*.

A group of researchers at the Swiss Media Lab created a personal memory and attention assistant. The assistant not only records, archives and indexes a person infolife, i.e. all the information exchanged and consulted in the daily life of a person, it also supports planning and organisation of daily tasks to perform.

Human memory is central in our daily life activities, not only to build relationships with friends, create our identity or reminisce about the past but also to drive our attention towards the most important tasks to perform and to manage our lives. Information overload, memory and attention lacks are probably the most crucial challenges to solve, not only for elderly people but also for the rest of the society. Elderly have memory and attention problems, without speaking about Alzheimer disease, which hinder their daily lives. Not only do they have difficulties remembering appointments and tasks that need to be done, such as buying bread or milk twice the same day, they might lose their glasses, they have trouble remembering people and places, which all result in insecurity and melancholic feelings. Younger people also face memory problems and often experience the "lost in the space effect" because of the constant increase of information a person owns and handles and its dematerialization.

A group of researchers at the Swiss Media Lab created a personal memory assistant, that supports a person in organizing and retrieving all the multimedia information accessed during his/her daily life. It also supports planning and organisation of tasks to perform. The assistant automatically logs, stores, classifies and indexes multimedia memories, including emails, documents, movies, articles read, conversations, meetings, radio programs, etc. and further supports searching in those memories. The assistant supports information retrieval and helps taking decisions and planning actions. Further, the assistant builds a long term knowledge map, useful for browsing and getting suggestions on things to read, watch, etc. using similar maps in the social network.

"Grasping the real bits"
The Swiss media Lab creates graspable holographic user interfaces.

A group of researchers at the Swiss Media Lab created a graspable holographic user interface. The interface interactive and polymorphic; it can be manipulated directly with the hands and changes its form according to the user intention. The Interface uses various technologies among which vision, force feedback actuators and holography to change the way we interact with computers. Several applications have been already implemented for various fields such as surgery training, entertainment, home remote controlling, or music instrumentation. Many other applications can be envisioned using this novel technology.

"Slow Time"
Slowing down our perception of time.

Time has been for ages the most critical and precious human resource. The Swiss Media Lab, in collaboration with Swatch, slows down our perception of time and reduces persons' stress, using bio-sensors and sonification techniques, coupled with a tasks management system based on user's agenda, user preferences and contextual information. Preliminary user evaluations have proved that the watch reduces significantly stress, improve productivity and users' wellness.

Back to the *Ether*Net?

S. Marchand-Maillet (UniGE/CVML) - 2015

Not so long after ecological, social and economical worries about transportation, communication technology has married with distributed information management to offer private and professional customers the needed facilities to reduce the 00's "hopping syndrome". The joint increase of wired and wireless, communication bandwidth, static and mobile network coverage, computing power and drastic decrease storage and device costs have greatly facilitated all aspects of the new no-origin way of multimedia management, the so-called Vaporous Net. Where exchanges were required to share data and information because of its once fixed location, the ideas of exploded and distributed data all over usage vicinities make it feasible to access it easily from any location.

Initially officially supported by the GRID network and less officially by P2P networks, the V-Net has smoothly overlaid the classical Web. Data is no longer stuck into storage facilities but truly lives over networks. Just come with your personal tag and… "welcome home!", your favorite data just groups in front of you in seconds. How about applications? Again, now well-established Web 2.0 technologies have made applications just some more data to access.

Having access to any data equally easily means being everywhere at the same time, in old standards. Hence, V-Net has made distant presence has easy and natural has could be. As a paradox, data is distributed but from a user perspective, information groups into a one-point location. Is it becoming a black hole?

Professional would surely answer negatively. Net-based activity (Net-meetings, telepresence, remote working,…) is made very natural by the V-Net (security is, as always, a challenge). It has become a ubiquitous communication channel allowing the logging and processing of all exchanges.

But the V-Net has also benefited individual users. The expansion of community spaces has joined the growing interest of users for multimedia. Sharing pictures, life recordings (a.k.a e-motions), and any other data is straightforward, just make it enter the V-Net.

And that's not just all of it. Many players have had to adapt their technology to the V-Net context. The major being search engines. How to retrieve information within this mass of volatile and location-less data? Evolving from P2P-IR, novel indexing structures have spawned and demonstrated their efficiency. Better, they have been the main driving forces to understand how data should live over the network.

In turn, swift and direct access to any data has allowed new ways of perceiving data. Querying is just looking for one piece of data. Why being so limited when any piece of data is equally easy to access? Go navigation! New tangible and body-based interfaces have materialized the V-Net and open new collaborative ways of working with data.

Can we expect more? Of course, good technology should by nature be discreet. Looking back, the WWW and then the V-Net are just steps to facilitate communication, simply forgetting about distances. The once good idea of virtual spaces with avatars is turning into a ubiquitous communication space pinching space wherever needed. Smart management tools will be our guides within the *Ether*.

TOMORROW'S TECHNOLOGY TODAY by H. Y. Pothetical

August 30th 2015

Scientists Announce Breakthrough in LogoBotics©

Since the middle of the last century, scientists have been seeking to develop a technology that could simulate a human being's ability to engage in spoken conversation, and hence allow human-machine interaction by voice. From that time there have been many false dawns … who can forget the spectacularly disastrous launch in 2009 of VoMo® - the 'keypad-free' mobile communications devices that, only six months later, were banned from use in all public spaces due to the excessive noise created by people's repeated vocal attempts to operate them, or SecureVoice® - General Auto's abortive attempt in 2011 to replace car ignition keys with a voice biometric device that ended up stranding all their proud new owners if they caught a cold. Both of these events undoubtedly contributed to Bill Gates' decision two years ago to ditch Microsoft's 'Conversational PC' research lab as speech technology clearly failed to make it into the mainstream.

Of course there have been successes … the huge SoftGoogleScan conglomerate continues to strengthen its grip on the global media management market based on its specialised use of off-line speech technology to analyse and search the world's telecommunications traffic, backed heavily by Western corporate and Government interests, and WaltPixar Studios has successfully driven down film production costs by using voice animation software as a substitute for previously highly paid Hollywood actors.

The problem is that all contemporary speech technology applications are based on AI^2 – artificial-ignorance/absence-of-intelligence – an approach that avoids the need to understand how human beings use and process speech by simply accumulating massive amounts of recorded data in a futile attempt to capture its intrinsic variation. Such techniques are now widely acknowledged to be fundamentally limited in their ability to support meaningful conversational interaction between humans and machines, and this has led to the emergence of the entirely new field of *LogoBotics*©.

Based on the PRESENCE (PREdictive SENsorimotor Control & Emulation) theory of spoken language processing first proposed by Prof. Roger Moore at the University of Sheffield in 2006, and subsequently developed by a consortium of top research labs in an international research project of the same name, LogoBots are devices that incorporate computational implementations of some of the latest discoveries in cognitive neuroscience and intelligent perceptual control in order to predispose them to acquire communicative behaviour in much the same way as a human child. Since 2010, a community of over 10,000 infant LogoBots are being brought up in normal interactive linguistic environments by care groups in many different countries. Linked together by the Hypernet and closely monitored by the scientists, the LogoBots have been gradually evolving the skills necessary to develop spoken language.

After a long wait, scientists have today announced that several of the more advanced infant LogoBots had uttered their first meaningful words and were engaging in simple conversational ineraction with their carers. This development is being described as a significant breakthrough in LogoBotics research and a leap forward in our understanding of how human spoken language processing works. It is now expected that the rest of the LogoBot population will rapidly catch up and the process of spoken language acquisition will accelerate, albeit much slower than in human beings. Scientists are quietly confident that by 2030, LogoBots will have developed sufficient spoken language skills to take on the simple tasks that you might expect to give to a 10 year-old child.

International Research Group Reports
Milestone in Access to Public Health Information

Brussels, Aug. 29, 2015. Today the AMICABLE research group reported what appears to be a significant milestone in the eradication of 3rd world pandemics. Benefiting from the joint European/US dedication to both basic and applied scientific research dating from the 2010 resolution by European Council President Bono and US President Barack Obama, the group has apparently achieved a breakthrough in techniques for the worldwide accessibility of public health information. Results from pilot studies reported today show that the accessibility of relevant knowledge from translated audio and visual records in many languages provided a significant boost for the public health statistics in several test African villages, both from access to more technical medical information for local health practitioners, and from access to less detailed but essential health tips and warnings for the general public. Previous related work was based on giving access to crop prices for semi-literate farmers in India, but the more recent work incorporated the automatic translation (and information extraction) of all health information relevant to an area.

American participants in the research were greatly aided by the national decision in 2009 to drastically change the ratio between military and scientific spending, so that the latter actually exceeded the former. As we all know now, this actually had the effect of increasing US and European security by reducing the perception of the West as being a belligerent party in world affairs. The mutual decision by American and EU funding agencies to drop all restrictions on nationality for research funding (including a major influx of US funds for research in Europe) also is said to have been a major factor in putting together the best teams for the highly aggressive targets of this research. According to project leader H.B. Wiseman, the audio/video cross-language information access effort was greatly aided by matching grants from both the US and European funding establishments, and the transatlantic cooperation was further facilitated by the full 3-dimensional holographic telepresence for group meetings so that international travel was not a major obstacle. This is particularly important given the travel disruption from the major flooding that has occurred in all major American and European coastal cities due to the excesses of the pre-Kyoto period (before 2008).

[Contributed by Nelson Morgan, ICSI].

Global Network International (GNI) Announces worldwide availability of Reality 'N Beyond™ Communicator software and services for GIFA handsets

September 5, 2015

Mobile network innovator and powerhouse, GNI has completed all regional trials of the Reality 'N Beyond™ Communicator software and is now shipping the application with ten models of its most popular laser-projector enabled handsets. Developed using the latest algorithms for background visual and auditory noise suppression, stabilization, low light conditions and low power consumption in combination with sophisticated memory capture and real-time image, form and audio synthesis technology, Reality 'N Beyond™ Communicator software and services offer any subscriber with industry standard hardware the ability to communicate better than without—at a distance and in person.

Subscribers in pilot programs and trials report experiencing more sensitive and emotional content, and more easily and creatively enhancing their messages to others than with prior communications or telecommunications technologies on the market. The Reality 'N Beyond™ Communicator is similar to the popular Reality Simulator, released by GNI nearly 18 months ago. Leveraging the research of world-renown AMI group, the Reality Simulator's viral spread and success in the entertainment, gaming and youth applications segment is attributed to its high fidelity and ability to effortlessly "learn" from its environment and, in particular, from its user. The software and service combine to store all pertinent information about the user's environment and behaviors during routine use of the handset for a variety of applications. Scenes and emotions from a subscriber's daily life are recorded and stored without effort and selected by the user for enhancement and simulation.

The Reality 'N Beyond™ Communicator combines the strengths of the Reality Simulator for local and non-real time applications with the resources of the world's fastest mobile network for real time communications. The laser-projection system integrated in the handset permits the addition of a network-based live or "stored" person or object in the local space. The highly accurate voice-driven interface is easy to use and the same audio hardware is used to simulate and reproduce familiar sounds.

Words just can't do it justice
"When I use Reality 'N Beyond™ Communicator, I can really project my ideas, thoughts and memories beyond what you would see and hear if you were standing next to me without this new feature in my handset," reports GNI subscriber and pilot program participant Jean Carletta. "I can be highly accurate using visual language and the memory in the network, or I can combine real and imagined elements in new ways at the touch of a button. This software unleashes my creativity with friends and in business unlike any application I've ever used!"

The new software is only available for GIFA (Generating Images, Forms and Audio) handsets launched in 2012, ship with the latest GPS technology, 4G network transmission chip, 45 Megapixel camera, pico microphones and micro-laser technology which permits projecting the remote caller in real size in 3D.

September 4, 2016

Headline: European Business and Government Leaders approve New Applications of Technology in Society

On September 3, the recently-formed European governing council, composed of government appointed delegates and the leaders of the top 10 global companies, and members of the UNESCO Technology in Society committee discussed and resolved all remaining issues necessary for the approval of Meeting Deck technologies for use in legal and healthcare applications. The approval for secondary education applications was also granted. Meeting Decks for business and public forums were approved in 2012.

Yesterday's meeting, conducted in the third generation (3G) AMI Meeting Deck, was a testament to the maturity of the technology itself. Forty representatives speaking 16 different languages in three simultaneous sessions were in attendance, with only 20% of the participants sharing the same facility. The committees' coordination was led and facilitated by a combination of 3D-rendered and robotic meeting assistants.

During the meeting, Meeting Deck Discrepancy Detector noted that the previously published agenda was respected, with two exceptions:

- 6 vice-presidents met in parallel to review final language for ethics in judicial applications in five languages, and
- Objections raised in 2010 by the Surgeon General of the United States were reviewed by fewer members than recommended by the meeting chair.

Detection of consciously-furnished false or misleading information by the latest Meeting Deck sensors were shown in 2013 to be 99% reliable for the top 20 cultural/language groups. As a result of the decisions taken by the council and committee, Meeting Deck hardware and software applications are certified secure and reliable for use in all live judicial/legal proceedings, for asynchronous depositions and for healthcare consultations and treatment.

The committee also pointed out that the dramatic reduction in cost for Meeting Deck observer hardware make Meeting Deck technologies ideal for global education standards. For those unable to afford the latest systems, grants for small Meeting Deck systems are available from local governments and many businesses provide second generation systems to qualified applicants. The committee also reported and the council agreed that curriculum options using Meeting Deck Educational archives meet or exceeded the UNESCO recommendations, thereby accelerating the approval of the systems for higher education by at least 2 years.

In a separate announcement, last week the UNESCO Technology in Society committee announced that it had successfully achieved its 10 year goals of using communications and information processing technologies for the benefit of society. Technology permitting the seamless communications and retrieval of multimedia information has repeatedly contributed to expanding employment opportunities worldwide (reducing the number of people living in extreme poverty), ensuring universal primary education to all citizens in all countries, eliminating gender disparity in all education and, by reducing the destructive impact of oil-based economies, to reverse the loss of environment resources relative to their condition in 2005.

Note: This summary prepared entirely using Meeting Deck. Time to prepare: 3minutes 21 seconds. Those with prior approval for consultation are able to use this summary to review all discussions and decisions interactively using the Meeting Deck review and search applications.

Second Generation Infobots: When Silence is Gold

Expect fewer but more significant contributions from your infobot

August 16, 2015

The best-known button on your personal infobot interface is, as everyone has learned hours after acquiring the must-have software, the "silence" button – better known as the "give me a break" button, or gimb. But things may change in the near future, after the announcement last week at the 20th Autonomous Agents Conference of the second generation of infobots. Launched by Mittal Digital & Network Technologies (MDNT), the second generation implements a novel relevance-emulator based on simulated annealing. If this sounds like Bantu, it basically means that your personal infobot will keep its interventions to a minimum, bothering you only when, and *if*, its contribution appears to be maximally relevant. The algorithm simply computes relevance (and makes your infobot shut up) with breathtaking speed. Says Narayan Rao from MDNT: "it is remarkable that our implementation sometimes exceeds human performance at computing relevance. We even wondered whether our algorithm outperformed the cognitive principles known as 'conversational maxims' or whether this is due to the relatively limited inference space of current infobots."

Despite their well-known verbosity, the market for infobots has grown continuously in the past five years. No wonder when you think a moment at what was like to look for information on your own in the pre-infobot, all-Google days. Everything had to be consulted manually: facts to be checked, sources to be quoted, related articles, weather/traffic/stock-exchange reports, and so on. It was reported around 2008 that the average information worker had to perform information searches between ten and thirty times per hour – of course, only with keyword search! Organizing a week-long trip to Hawaii could involve thousands of information retrieval calls, and especially last-minute ones: air-traffic, weather conditions, latest shows in Waikiki, to say nothing about restaurant menus and airport transfer options.

Remember how fast the first generation infobots changed all this? Reversing the Google-based paradigm of information search, infobots anticipated your search needs by sensing your immediate information context, and brought to you all the related information before you even thought of formulating your query. Incidentally, this also increased tenfold the traffic to Google's servers, mainly from infobots. Granted, the first infobot versions presented you with overfull interfaces or an avalanche of vocal messages, but among these one could easily find precious bits of information, which often enhanced and illuminated one's work, boosting creativity and connecting sources of information to people all over the world.

And then, when stress was too high, there was the gimb button. With the second generation in final testing version at MDNT, be prepared to say goodbye to the gimb, and start paying more attention to your infobot.

Andrei Popescu-Belis

Technology optimist’s column from the future...

Steve Renals (University of Edinburgh)

2015-08-28

You still can’t have a beer with someone remotely, but remote meetings have gotten a lot more natural over the past decade. Ten years ago you were lucky if a multisite video conference worked first time; luckier still if everyone was in frame with no exposure problems. And even if the basic technology worked, meetings were stilted affairs, it was difficult to gauge the mood of the meeting, the social dynamics just weren’t there. In fact, not being *there* was the problem—the biggest difference between real life and virtual meetings was the lack of a real sense of presence in a remote meeting.

In 2005 only about 1% of conference rooms had videoconference facilities. Now it seems that only 1% haven’t. So what’s changed?

The underlying technologies are more efficient and robust, thanks largely to the acceptance of a number of generally accepted open standards, as well as the new massively parallel generation of processors, originally optimised for media processing and gaming. Allied to this, new signal processing approaches ensure that the audio and video quality is always excellent: the sensors (wherever they may be) adapt to the users, predictive machine learning ensures that the picture never switches to the key person a few moments too late.

Affordable, high quality audio and video displays make the immersive world of videoconferencing a productive and fun place to work. Indeed, an increasing problem is the addictive nature of the technology. Combined with the new ways of constructing spaces both for communicating with each other and with data and applications — again deriving directly from machine learning and signal processing — it has become apparent that for many teams the optimal way to work is by using this technology. Even if all members of the team are in the same place.

It used to be said that remote meeting technologies would only take off if there was a travel backlash, due to fear of viruses or terrorism, or maybe an ecological crisis. Not many people believed it would take off because it was a better way to communicate, enabling teams to be more productive, and the process of teamwork to be more enjoyable.

Things aren’t perfect: our systems are great at pulling out the right information at just the right time, but sometimes they are still annoying or intrusive. And if the organizational culture into which they are deployed is somehow broken, then these systems can magnify the problems — if there is a lack of trust in an organization, then, as we have seen in some recent cases, a communication environment that can store and interpret every nuance and every modality can be as much a threat as an aid.

Digital companions, a growing market.

Rutger Rienks, University of Twente

Over the last decade we have seen a stunning increase in computer systems that aid users in their everyday lives. After the successful launch of 'shopping assistant' for the PDA in 2007, the domains for which our little friends emerged rapidly expanded. Nowadays it would be unimaginable not to have your buddy assist you during an important business meeting or not to have him suggesting, or at least optimizing, the schedule for your next day off. It turns out that digital companions are now able to assist us with around 40% of all our activities. If we are either too lazy or too busy with other things we can explicitly ask for assistance. When we are in a situation where our buddies find us not acting according to the appropriate procedure or being too slow they may even pro-actively report their qualities.

Once Human Computer Interaction broke with the old-fashioned evaluation techniques that were pushed by the cognitive scientists until the mid eighties of the previous century, we saw a boom of so-called radial innovation in the field. People were free to design and develop whatever application they thought would benefit humankind without the actual presence of explicit definition of human needs and other constraints. This *research in the wild* led to the rapid expansion of the HCI framework. Single-user applications changed via multi-user to distributed multi-user applications and traditional interfaces such as mouse and keyboard were extended to natural interfaces with optimal use of different modalities.

According to some early adapters of the companion technology the rapport factor, or possessing the notion of the buddies' capabilities has proven of utmost importance. "If you cannot align with your companion, the two of you are communicating on a different level and you won't be able to exploit its benefits" Companies like Zu-Zu-La, who claim to have sold over a million copies of `Cooks-for-your-kitchen' for their buddy within the first weeks, let us know that intuitive interaction in combination with implicit affordances that inform the user of how to *become friends easily* were embedded into the design.

One of the key factors that led to the success was the idea that interaction with the companion was brought to the level of representation. Companions are no longer solely assisting you, but also representing you. Starting with Find-a-match® that arranged and scheduled your dates at the cybertheatre, we are now all fully accustomed to having our companion handle the weekly phone call from the mother-in-law. With more and more niche activities becoming downloadable and more and more features being added we foresee that, when looking at the latest trends of brain computer interfaces becoming more and more prevalent, it won't take long until the first brain interface for your digital companion will be realized.

Today in 2015 we are living in an Internet of Things world.

Laurent **Sciboz**

The attribution to physical objects, whether alive or inanimate, of a *unique* identity that can be easily transposed to the virtual world of computer systems. The concept of identity is fundamental to an activity that may seem trivial to humans, but turns out to be difficult and complex for computer systems: communication. And it is precisely this ability to communicate that RFID technology grants to everyday objects – to communicate their presence, to communicate their identity, and to communicate the contents of an ever increasing memory.

Hence the notion of an *internet of things*, which simply consists in bestowing the ability of connecting and communicating through the internet to everyday objects. The unique identification of physical objects – combined to a communication infrastructure that transcends traditional barriers between companies, industries and individuals – opens the door to a world of innovative applications, many of which today still only exist in the mind of a few visionary entrepreneurs. The potential of the internet of things measures up to the gigantic amount of information which it makes available in real time. In the industrial sector, benefits in terms of productivity, quality and market intelligence are priceless. And for individuals, benefits in terms of access to information as well as of increased safety standards – prominently in the food and pharmaceutical sectors – represent progress comparable in its reach and depth to the emergence of mobile telephony or of the internet as we have known at the beginning of the millennium.

Video indexing systems police themselves

Tim Siglin, 1 September 2015

Recently published research supports the claim - made almost a decade ago - that video and audio recording and transmission systems are capable of learning pattern recognition from previously acquired content, effectively building a library and generating summarizations of key content on the fly.

The research, jointly published by IDIAP, TNO and the University of Edinburgh, notes that video and audio systems built on licensed technologies created during the second phase of the AMI project in 2007 are 300% more likely to positively identify key meeting participants and key agenda points than other current systems using only one mode of identification.

The video indexing systems, once considered unreliable and ineffective, have also increased their usefulness by providing scenarios-based indexing, searches and retrieval of content that complements a user's manual choice of key phrases or agenda items. These video indexing systems contain metadata gathered from previous indexing sessions, previous searches and previous use cases - the latter tracking those instances where content gathered from searches is actually used.

"The key to the systems learning from one another extends beyond referencing the typical automatic indexing used in the past," said an IDIAP spokesperson, "and even extends beyond the more recent trend of cross-referencing user generated searches. The cross-referencing of actual content usage in scenarios such as content syndication, web publishing and audio/video editing is vital to understanding the differences between our automated systems and the actual repurposing of content."

The technologies implemented in these systems include those a beam microphone, facial recognition and motion picture OCR technologies developed under AMI and licensed to key multinationals and startups between 2007 - 2009.

"These technologies were vital to expanding the breadth of our jointly-developed indexing systems," said a University of Edinburgh spokesperson. "We'd each contributed to the initial research, shared in the reward of licensing the technologies, but also leveraged our initial knowledge to move the integration of these technologies forward to aid the next phase of research into automating content indexing and retrieval."

"The transmission portion of the audio and video systems is often overlooked," added a TNO spokesperson, "but our client base in the space and defense sectors felt that transmission was a critical component for their programs. This critical component has additional benefits to the average rich media consumer as well, which in turn attracted companies looking to leverage these components for consumer-created social content networks."

The Reasoning Revolution Revealed

Hanna M. Wallach

Ten years ago, the technology industry was in the middle of an information revolution. We could store, process, and share far more information than ever before, and were working out what these new technology capabilities meant for society. Now, storing and processing information is easy, and scientists are facing a new set of questions. How can we learn from, and reason about, the vast quantities of information now available to us? Until recently we used computer databases to store data, but left understanding data as a job for humans. Humans are very good at reasoning about data, even when the available information is highly uncertain. Humans are still much better at reasoning than computers, but machine reasoning is becoming more and more important, for practical and financial reasons. Machines can work faster and for longer hours than humans, and make fewer mistakes.

Most of us have only heard of "Bayesian" reasoning in the last few years, perhaps first in the context of spam filtering. But Bayesian reasoning was actually invented over 250 years ago. The cornerstone of the Bayesian framework is the idea that probabilities can be used to describe degrees of belief. Advocates of Bayesian reasoning argue that in order to carry out useful reasoning about data, computers need to do what humans do, and start by making assumptions. These assumptions are encoded mathematically as 'priors', which describe how much we believe that each possible state of affairs is really true before seeing any data. Bayesian inference provides a framework that combines these prior beliefs with actual observations, enabling us to adjust our beliefs as we see more data.

Until recently, many people questioned whether the Bayesian framework made sense, or was useful for real problems. But thanks to recent improvements in the understanding of Bayesian inference outside the statistics community, and big increases in computing power, Bayesian probability is now hailed as the key to machine reasoning. It has already been quietly adopted in many systems, enabling computers to carry out reasoning that was previously done by humans. Some of the first areas to adopt the Bayesian framework include medicine, where Bayesian methods have been used to identify the parts of the brain responsible for particular tasks, and the media, where articles, TV programs, radio broadcasts are now automatically categorised using Bayesian techniques to bring us the most relevant information about the topics we're most interested in.

You can bet that when he drew up his "doctrine of chances" in the 1700s, Reverend Thomas Bayes, the father of the Bayesian framework, never realised that he would be responsible for a new generation of machine-based reasoning. But those of us currently experiencing this reasoning revolution are extremely grateful.

IBM's Breakup Averted

Pierre Wellner

Friday August 28th 2015

While most once-mighty international corporations are hopelessly disintegrating in the face of world-wide civil war, IBM may be bucking this trend, thanks to new communications technology developed in Europe.

Like other formerly successful global companies, IBM operated through distributed decision-making with offices throughout the world. A little-recognized underpinning of multinational corporations, however, was that smooth operations depended critically on regular face-to-face meetings between executives to work out differences, and maintain working relationships.

Now that travel has been impossible for several years, and with no end in site to the civil wars raging in Saudi Arabia, Russia, and the Middle-East, this dependence on face-to-face meetings has slowly become painfully apparent, as one multinational company after another cannot resolve its internal conflicts.

Just like our political leaders worldwide, today's business leaders are finding it impossible to hold organizations together without in-person meetings for persuasion, mediation, and conflict resolution. High-definition video conferencing is widely used, of course, but is not enough to prevent the "us-vs-them" mindset from poisoning companies once their leadership has been physically apart for more than two or three years.

IBM, on the other hand, may be avoiding this seemingly inevitable fate, thanks to the recently developed Amicable system that it has inserted into all its communication systems – both internal and external.

Employees continue to use high-definition video conferences and shared reality spaces as usual, along with old-fashioned video, voice, email, phone calls, presence-based IM, and web browsing, but Amicable continuously monitors and augments all these communication flows as they happen.

"With full access to all communications of the company," said IBM CTO Sarah Favre, "Amicable is able to detect emerging conflicts before they become irresolvable." The system suggests adding (and removing) people as needed, to keep important decisions and projects on track, and it works in conjunction with the latest conferencing systems to assist with mediation and conflict resolution.

Through pattern recognition on continuous streams of media, text, and social networks, Amical is able to detect potential problems in remote corners of the company, and make suggestions for appropriate people to ask questions or hold a meeting. It even suggests appropriate agendas for these meetings, and provides the necessary background materials. As people communicate, the system helps everyone stay aware of what they need to know, as well as what they can safely ignore. It enables everyone to be well-informed of how they are perceived by others in the organization, and how they may be helping or hurting the projects they work on.

"We have had such internal success with this system," says Favre, "that we have started selling it to many of our biggest customers. The communist party of China has begun installing it throughout its cantons and villages."

After helping to save IBM, could Amicable technology avert the looming civil war in China?

tPlay sales surge to 100 million units per year

Pierre Wellner

Friday August 28th 2015

The biggest driver of audio device sales this year is clearly tPlay.

Until recently, radios and personal audio players were primarily used for music playback. Talk was a niche market, mainly for news-related programs, and the smaller books-on-tape market.

That has obviously changed, however. Today the tPlay chips and software are installed in nearly every new cell phone and personal audio device sold, including most new car audio systems.

To better understand this phenomenal success, we asked Frank Crittin, the company's founder and CEO to explain.

"The ground was laid for tPlay's success due to several factors." Frank says:

1) Audio broadcasting gave way to on-demand and stored media distribution over IP (e.g. podcasting), so that audio devices were no longer limited by on-the-air broadcasts.

2) The merging of cell phones with other portable electronic devices led to personal audio-oriented devices becoming the dominant computing platform for most people.

3) The emergence of loudspeaker array technology made it possible to listen to personal audio devices privately without the need to wear anything on the ears.

4) European research projects initiated by partners associated with the AMI project developed a number of key technologies behind tPlay.

The result was software that makes speech (or "talk") as easy to navigate, skim, browse, search, and interact with as text. tPlay has made text and speech completely interchangeable, and has made it possible to seamlessly navigate through text and talk in very similar ways.

Near-perfect speech recognition and text-to-speech is obviously a fundamental component of tPlay's power, but this is only part of the package. tPlay's simple multimodal gesture, eye, speech, and brain controls allow full control of how we listen to speech, just as easily as we control what we read on our screens.

Thanks to tPlay, we can "surf" text and speech with our ears, control the speed at which we listen, follow hyperlinks, search for related items, skim through stories, summaries, and social networks all while driving a car or walking outside. We do it not only with text and emails, but also with live conversations and the recordings that most of us continually make of our daily lives.

Because of its translation capabilities, tPlay can also transform any audio device into a kind of multi-lingual telephone. This is the technology behind Skype's LanguageLine, and is the cause of recent growth in technical support call centers from China. Whereas off-shore call centers were once the province of Indian companies with access to English speakers, now they have out-priced themselves and the Chinese can also compete effectively in this market. tPlay language interpreting allows them to serve not only American and British customers, but also people of all languages throughout Europe.

ClientTalk revolutionising social work

Maria Wolters

A new system is revolutionising the work of Edinburgh Council's Social Work department. The ClientTalk system, developed by a team of leading European scientists, listens in on conversations between social workers and their clients and produces custom summaries of what was said on the touch of a button. Social workers are full of praise for the system, which drastically cuts down on the time they have to spend writing up case notes. Louise McCall is a Leith-based social worker who conducts home studies of couples who want to adopt a child. She says: "Before ClientTalk, putting together my final report based on hours of interviews with the couple was an enormous amount of work. Now, ClientTalk gives me a concise summary of what each couple said about relevant topics such as infertility or family background. I then edit this summary and add in my own assessments, and I'm done in half the time I needed before." Jack and Nadine Jones, a couple from Granton who have recently adopted two-year-old Nicky, said: "We were really impressed with the accuracy of our report. Before the process, we were afraid that everything we said could be twisted and turned against us. That wasn't the case at all - we truly feel we've been heard."

ClientTalk has also revolutionised the assessment of care needs. After listening to the assessment conversation, ClientTalk not only automatically produces a document that summarises the measures that have been agreed on – it also generates all the necessary orders. Social worker Peter Smith is enthusiastic about ClientTalk. "It does almost all the administration – which leaves me free to spend extra time with the people I'm assessing and get to the bottom of what they really need." Richard Gibbon, 69, was impressed with the system's efficiency. "I remember that when my parents were assessed way back in the 1980's, it took ages for Social Services to get its act together. Now, the social worker comes into your house, you have a nice long chat over a cup of tea, the next day you get a list of what will be done in your email, and two weeks later, the technician shows up and installs your kit. When something goes wrong or doesn't work as it should, I just phone my social worker, and three hour later, I get an email that summarises what needs fixing and tells me what they will do to fix the problem."

Modern smart homes enable more people than ever before to be cared for at home, but adjusting the technology to the needs of the people who live in a home has proved tough in the past. Before ClientTalk summaries, social workers used to have to spend hours in the office fine-tuning the different devices. Now, all the basic policies for controlling the smart technology are derived automatically from the home care intake interview. Social workers follow a fixed interview structure which allows the system to automatically create a tailor-made profile.

Participants

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