The magazine for EPFL graduates

December 2015
No. 3

ALUMNI

The Microengineering section p. 21
Alumni at Google p. 12

DRIVERLESS VEHICLES, ROBOTICS, NUTRIGENOMICS...
TEN TECHNOLOGIES THAT WILL CHANGE THE WORLD
Vos idées vous appartiennent
Nous vous aidons à les protéger

Brevets
Marques
Designs
Veille technologique
Dear Alumni,

EPFL’s international visibility continues to grow. Recently, this recognition was displayed again in the QS World University Ranking. Our school ranked 14th in the world’s top universities and reaches in the top 10 in science and technology. EPFL is rising, now closer than ever to the most reputable U.S. universities.

Attachment to one’s school and the notion of giving back are now common in Europe. These values are firmly rooted in the culture of the leading universities, with which EPFL now stands. This issue’s report on giving back will bring you some insight into this tradition through the portrait of four of our donors. It is thanks to them and all of our donors that EPFL has undergone spectacular development.

EPFL does not set out to imitate any pre-defined model. We are carving our own path, with the genius that sets us apart. That means if you want to contribute, you can show your commitment and get involved in the school’s development in the manner that best suits you. Support extends beyond personal and financial contributions. There are many other ways you can demonstrate your attachment to EPFL. You can volunteer for one of the EPFL Alumni programmes, either by working with a local chapter or by mentoring a student or a start-up founded at the school. You can simply be an EPFL ambassador every day, by proudly representing your school in your professional and personal lives.

This attachment already shows for many alumni. We are truly grateful and hope that it will be even stronger tomorrow, to strengthen the ties that unite our school with its alumni.

Patrick Aebischer,
President of EPFL

“EPFL follows its own path”
Dear Alumni,

Two years have gone by since EPFL Alumni became a department on its own. During these two years, we have worked to bring you a broad range of services that meet your expectations. Thanks to you, 75% of these efforts were funded internally through your donations. We would like to express our heartfelt gratitude.

As these two years come to a close, we are focusing more than ever on the future. Of course, we mean the future of EPFL Alumni, as we look for new ways to support the network of 30,000 graduates that you are a part of. That said, we also want to focus on the future of technology.

In the context of a rapidly changing economy where technological advances are revolutionising our daily life, this issue’s special report features ten developments that are starting to shape our world, our jobs, and our education, and will continue to do so in the future. Connected objects, renewable energy, robotics, the sharing economy and nutrigenomics are just a few of the types of technology you will discover and learn more about in this overview. We hope that this report and the many other articles, photos and stories that you will find in this third issue of Alumnist will keep you informed about the liveliness of your alma mater and provide you with an enjoyable read.

Annelies Garcia, head of EPFL Alumni

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Four alumni describe their job at the American tech giant.
Following the great success of the previous edition, the 2015 edition of the «Swiss Alumni Event in New York» took place on October 2nd at the Royalton Hotel, in the heart of Manhattan, and was another hit. This year’s event featured distinguished guest speaker Carine McCandless and gathered many alumni from EPFL and ETHZ.
SAN FRANCISCO
AUGUST 18 2015
The Inside Real Virtuality exhibit is a multi-user immersive platform combining a 3D environment seen through a virtual reality headset, with a real-life stage set. Users are tracked by a motion capture system, allowing them to physically move through a virtual environment. 30 alumni from EPFL and other Swiss universities joined at swissnex San Francisco to discover and enjoy this incredible technology.

ZURICH
SEPTEMBER 2 2015
The EPFL Alumni Association of Eastern Switzerland invited its members to tour the Freitag bag factory in Zurich-Oerlikon on September 2nd. About 20 alumni gathered to visit the Swiss company, which produces about 350,000 accessories per year by recycling old lorry tarpaulins, bicycle inner tubes and used seat belts. The event provided the perfect opportunity to learn more about those legendary bags hanging from everyone’s shoulder these days. The tour was followed by a cocktail buffet.

TUNISIA
AUGUST 6 2015
A new chapter of the EPFL Alumni association was set up in Tunisia over the summer. The association teamed up with TUNES (the Tunisian university students’ association in Switzerland) to organise its first event, a reception for Her Excellency Rita Adam, Swiss Ambassador to Tunisia, at the Mövenpick Hotel in Gammarth. Rita Adam’s speech was followed by a cocktail party. The gathering offered alumni from EPFL and other Swiss universities who are living in Tunisia the chance to get together for the first time.
Keeping it in the family

Being EPFL alumni from generation to generation means sharing a rich history and a myriad of memories. Three families talk about their experience passing down the EPFL spirit.

Vittorio Rossati is a third-year civil engineering student. Growing up around his father Stefano and his brother Marco, both EPFL alumni, his history with the school goes back much further. Did family background play a role in choosing his path? “Undeniably,” replies the young man without a moment’s hesitation. “When time came to choose between different universities, my father’s and brother’s experience convinced me to get my training at EPFL.” His father Stefano confirms: “The excellent education I got at EPFL more than 30 years ago remained embedded in my mind. I made that resonate with my sons.”

The situation is similar with the Meylans. Edouard grew up in the watchmaking world, a field in which his father Georges-Henri is one of the leading figures. “My father’s experience showed me that EPFL could help me live my passion with a 360-degree view, so I didn’t hesitate.” A 1971 graduate, James Rinaldi sent his daughter Tania and his son Nils to the school a few decades later. He says that he did not try to influence their choices, but he admits to sharing with them his wonderful memories as a student. “I don’t know if my father’s and brother’s experience was the deciding factor,” says Tania Rinaldi, “but their enthusiasm for EPFL definitely had a positive impact.”

PASSING THE TORCH
Getting the same education as other members of one’s family often means enjoying the same memories of campus life. “When we reminisce about our time there, we always remember the social aspect most. The Satellite student bar, the Balelec festival, Vivapoly comedy club and the Challenge,” say Tania Rinaldi and her husband Hadi Barkat, who met as students at EPFL. The couple feels that the main events that take place over the academic year at EPFL are the highlights that stay with people long afterwards. Vittorio Rossati recalls “discovering

RINALDI FAMILY
James Rinaldi, now retired, graduated in 1971 with a degree in electrical engineering. He was formerly an IT consultant at the company TI Informatique. His daughter Tania is a professor of neurophysiology at the University of Basel, and his son Nils is Project Manager at EPFL. Tania’s husband, Hadi Barkat, got his post-graduate degree in Management of Technology in 2002. He is now founder and CEO of Hettleiq, which publishes games, books and design gifts.
new cultures, football matches at the Satellite bar and the quality education.” Magistrale, or Graduation Day, is the other main occasion when people come together at EPFL; as his father Stefano remembers, “Our last memory that we share from EPFL is Marco’s graduation in 2011. The entire family was reunited, with three generations of engineers.”

Passing the torch from one generation to the next is also a way of measuring how far the school has come. Everyone points to the international development of EPFL over the past few decades. “We went from a cantonal school with a few technical specialities to a global institution with international reach, mainly thanks to the efforts of Patrick Aebischer and his team,” says Georges-Henri Meylan. James Rinaldi makes a similar point. “The school has opened up to the world. My two children were able to do a year abroad programme, something I’d never even dreamed of at the time.” His daughter Tania highlights the growing number of female students and the international recognition that EPFL now enjoys. “The people I met when I was living in Boston knew about EPFL.” Her husband Hadi Barkat is delighted to see the school take on an entrepreneurial role on top of research and teaching: “I hope that an even greater number of robust start-ups will develop in the years to come.” Nils Rinaldi, who now works at EPFL, notices that every day. “Since I graduated in 2000, the number of students has doubled, and the campus is now thriving. Lots of prestigious international professors have been hired.” Some things never change, however: “I had some of the same professors my father did!”

**FUTURE GENERATIONS**

Having the same alma mater as one’s parents or children strengthens their attachment to EPFL. And that is reflected in different ways. Edouard Meylan is involved in the alumni organisation. “For example, we set up a tour of my company (H. Moser & Cie) for EPFL alumni in 2014.” Stefano Rossati set up a unit for his company close to EPFL in order to both recruit engineers from the school and develop new technologies with its laboratories. His son Vittorio shows his fondness for the school by returning to his French lycée every year to present EPFL to future graduates.

Will future generations also study at EPFL? The process is already under way for the Meylan family. One of Georges-Henri’s nephews enrolled in the physics section in September. Options are also open in the Rinaldi family, but Tania and Hadi insist that their daughters will make their own choices about where they want to study. The same applies for Nils’ children, even though Theo (age 3 and a half) and Noah (age 1) already spend three days a week on campus at the Polychinelle child care centre, near the Rolex Learning Center. As their grandfather James says: “If EPFL maintains the same level of excellence as it has now, I’d be keen to see more EPFL alumni in the Rinaldi family.”

**ROSSATI FAMILY**

Stefano Rossati was a member of the mechanical engineering Class of 1985. Today, he is Director of the company Le Gaz Intégral. Marco Rossati graduated in 2011, also with a degree in mechanical engineering. He currently works as a Project Manager and Energy and Environment Consultant at the Geneva-based energy engineering and consulting firm, Amstein+Walthert. Vittorio Rossati is a third-year student working towards his undergraduate degree in civil engineering.

**MEYLAN FAMILY**

Georges-Henri Meylan holds a mechanical engineering degree earned in 1969. He was at the helm of Audemars Piguet for more than 20 years. Today, he is Chairman of the Board of Directors at MELB, the family-owned holding company which owns the watch brands Hautlence and H. Moser & Cie. His son Edouard completed his Microengineering degree in 2000. After developing retail in Asia for the Desco group, he became CEO of H. Moser & Cie in 2013.
The network of Olivier Français

Politician, EPFL engineer, seasoned athlete and President of the International Alpine Film Festival at Les Diablerets, Olivier Français has shaped his career in line with his many interests. He discusses the people in his network.

Lausanne owes him its metro and the four-kilometre underground tunnel providing access to the Tridel waste treatment plant. Olivier Français has successfully combined his political involvement and civil engineering expertise and used them to serve the community. After graduating from EPFL, he became the assistant to Professor Edouard Recordon and was involved in fundamental research. Olivier then worked for two years at a geotechnical engineering firm before being hired by a construction company in the Zschokke group. “Building on all that experience, I was able to buy and take over a geotechnical engineering firm.” His political career with the liberal radical party started taking off at about the same time. In 1994, Olivier Français began serving as a communal councillor and was elected to the Grand Council of Vaud in 1998. He became a city councillor for Lausanne in 2000, where he headed the Works Department, and has been a member of the National Council since 2007.

The many facets of his career have led him to meet all sorts of people active in politics, culture, economics and sports. And he himself is a dedicated athlete. “The people in my network share at least one of two qualities, rigour and commitment. Founders of sports or cultural events, company directors and specialists driving new technological advances, many of them have taken part in some slightly outlandish projects, some slightly outlandish projects nevertheless destined for success.”

His cultural network

Daniel Rossellat, founder of Paléo Festival Nyon, mayor of Nyon, independent. “Daniel Rossellat also coordinates the Lausanne music festival, Label Suisse. We worked together in 2008, when the M2 metro line was inaugurated in time for the festival. He skilfully turned the two events into a single, huge celebration for the public. Daniel is one of those people who shares his passion and gives everyone the opportunity to enjoy a fantastic cultural experience.”

Jean-Philippe Rapp, journalist and former television host. “Jean-Philippe Rapp is the director of the International Alpine Film Festival at Les Diablerets. When he asked me to be President in October 2014, I didn’t give it a second thought. I’m lucky to participate in this great cultural adventure with such a talented person, who knows how to gain people’s trust.”

“We asked Olivier François because he’s a strong athlete and a hard worker,” says Jean-Philippe Rapp. “He has that rigour and ability to adapt that only EPFL graduates have. And those two qualities are useful for the president of a festival in the mountains. His commitment is limitless, and he’s generous in his efforts.”
Christ Wolf, LHC’s sales and marketing director, says of Olivier Francais, “We quickly hit it off with this ingenious athlete. He is straight-forward and has always met our expectations while bringing his ideas and vision.”

His allies in sports

Bertrand Cardis, director of Décision, a company active in building innovative structures using composite materials. “Bertrand Cardis played a role in the success of the solar aeroplane Solar Impulse and Alinghi, whose boats he built. I compare him to Professor Calculus, because he dares to achieve the impossible.”

Jacques Bourgeois, National Councillor, PLR, Fribourg. “We have been sitting side by side in parliament since 2007, and I consider him to be my ideological twin brother. I admire him as a lobbyist. And in our private lives, we share a passion for endurance sports.”

His close friends

Didier Burkhalter, Federal Councillor, PLR. “I met him when he was an executive member of the Neuchâtel city government, where he launched and completed a number of projects. I then had the pleasure of working with him when he was State Councillor. There again, I noticed how effective he was. His understanding of all the projects and ability to handle any situation set examples for me in exercising my own duties. Together, we talk about our current and future projects.”

Political contacts

Entrepreneurs that inspire him

Corina Eichenberger, National Councillor, PLR, Aargau. “Corina is my reference in German-speaking Switzerland. She is an excellent contact and has vast experience in legal affairs, banking and construction. Corinna was the first woman to chair the Grand Council of Aargau and has the calibre of a Federal Councillor.”

Philippe Hebeisen, CEO of Vaudoise Assurances. “Despite his share of challenges, Philippe Hebeisen has maintained the values of his company and made it prosper while keeping it a reasonable size. His intelligent strategy has paid off, as Vaudoise has successfully moved into German-speaking Switzerland. Philippe is extremely friendly, someone I’m always happy to spend time with.”

Cristina Gaggini, director of Economiesuisse for French-speaking Switzerland. “Cristina Gaggini is generous and available, a precious contact at Economiesuisse who’s in touch with others. She understands and oversees her projects with flair.”

Sacha Weibel, Chris Wolf et Patrick de Preux, the trio from the Lausanne Hockey Club. “They breathe life into LHC, and by extension their city and their region, using their talent to serve the local community. They are the soul of this club and have formed a lasting team.”

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Jacky Delapierre, founder of Athletissima, an athletics event in Lausanne that celebrated its 40th anniversary in 2015. “Fifteen athletes 40 years ago, 300 today. Athletissima owes its current reputation to Jacky Delapierre. He has understood how to gain athletes’ trust, generation after generation. His commitment and success amaze me.”

Stefan Nellen, chairman and deputy director of the Tridel incineration plant in Lausanne. “Stefan helped me throughout the project to build the Tridel plant. He’s very talented and reliable in performing his duties, and always offers good advice.”

Georges Zünd, director of the Vaud Federation of Entrepreneurs. “Georges is an exceptional person. He’s a great networker and a man of high moral standards and good common sense. He is very generous, in all areas, especially with his time.”

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Google Zurich attracts talent from EPFL

The Internet firm has been operating out of Switzerland’s largest city for more than ten years and employs numerous graduates from the Lausanne-based technical school. Four of them share their experience.

“Google is looking for intelligent team-players who are capable of making progress”, says Veronika Striessnig, University Programs Specialist at the company’s Swiss office. Google Switzerland opened its office on the Limmat river bank more than ten years ago and today it is the biggest engineering center outside of the US. During job interviews, Google looks for role-related knowledge, assesses a candidate’s leadership skills, their overall “Googleyness” and how candidates think. In in-house lingo, Googleyness refers to the individual’s compatibility with Google’s culture.

“We want to find people with not only one specific skill set, but lots of different strengths and passions,” says Veronika Striessnig. “We also want to make sure that the person has the experience and background that will help them be successful in every aspect of their job.” Engineering candidates are being tested for coding abilities and other areas of technical expertise. A number of EPFL alumni who have applied at Google fit that bill and are now part of the team.

Burak Emir did his undergraduate studies at RWTH Aachen University, during which he did an exchange year at EPFL during the 1999-2000 academic year. After graduating from RWTH Aachen, he returned to EPFL in 2002 and completed his PhD at the Programming Methods Laboratory (LAMP) in 2007.

As a team lead, he must keep his team and code “up to date” with respect to the technological advances and constant changes in both offline and online commerce. Burak is also responsible for “improving the user experience” for merchants and advertisers while coordinating the development of new, experimental features with other teams. His duties also include helping new hires learn about the infrastructure.

In addition to the technical skills that allow him to provide a personal contribution and understand new technologies faster, Burak Emir highlights two fundamental things he learned as a student. The first was that the pursuit of abstract, ambitious goals requires time, commitment, attention and communication.
He finds this thoughtful approach much better than focusing on the short-term. “I also learned the importance of social factors that underpin all scientific and technical projects,” he says. “You have to learn how to work with a team in a laboratory or remotely with colleagues based in other offices. There are limits to what one person can do and accomplish alone. It’s only by working together and building on different viewpoints that we can achieve great things.”

Richard Ekwall graduated from EPFL in 2002 with a Master’s degree in Computer Science and completed a PhD in Computer Science five years later. He currently works as a Software Engineering Manager for the Google Maps division. “My job involves a combination of management, designing new systems and writing codes. We interact with several teams from different offices at Google. What we do affects products all over the world. It’s very exciting.”

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His education gave him fundamental expertise in Software Engineering, especially in analysis and programming. He also gained strong mathematical skills. “I can clearly see a difference to people from other universities or people who did not study Computer Science, but Mathematics or Physics, for example.” In addition, the network that EPFL helped him build remains useful to him today. “I know a lot of EPFL alumni who currently work at Google. That means I can stay abreast of various events and promising opportunities.”
Mihajlo Velimirovic graduated from EPFL in 2009 with a Master’s degree in Computer Science, with a specialization in foundations of software. He now works with the Search Ads Quality team, which makes sure that the ads displayed in search results are as useful and relevant as possible. To accomplish this task, the team uses different machine learning techniques so that ads improve the user experience of Google searches.

“My education at EPFL helped quickly establish my credibility within the first team I worked with at Google,” Mihajlo says. “I graduated with strong foundations in cryptography, networks and algorithms, skills that are essential for working on large-scale systems. I’m also glad I gained expertise beyond my specific area of study while at EPFL. The ‘Intelligent Agents’ and ‘Game Theory’ classes were very useful.”

GOOGLE IN ZURICH

The Zurich branch of the U.S. tech company is home to Google’s third largest engineering department in the world after Mountain View, California, and New York. In 2014, Google celebrated its tenth anniversary in the Swiss city. Worldwide, the company employs more than 57,000 “Googlers” with nearly 1,500 of them – from over 70 countries – based in Zurich. Google’s engineers in Switzerland develop products and services for users across the globe. Large mapping and navigation service hubs were set up there, and the Zurich office is also where many ads and messaging components are coded.
Pascal Fleury

45 ans, senior software engineer

Pascal Fleury completed his degree in Communication Systems at EPFL in 1994. He went on to obtain his PhD at the Signal Processing Laboratory (LTS). Today at Google, he works as a Software Engineering and team manager. “Many projects at Google are about classification of some sort (labeling businesses, mapping locations, detecting duplicates) and mining knowledge. We currently use both to build a system that can formulate answers from structured data in an eloquent way.”

Pascal has strong knowledge of Mathematics, Computer Science and numerical analysis, all of which he learned while studying at EPFL. “I can draw on those skills at any time. As a student, I also learned how to approach broader issues and how to deal with the unknown,” Pascal says. “All this keeps my team and me prepared to tackle the various technical challenges that we deal with every day at Google.”

“As a student, I also learned how to approach broader issues and how to deal with the unknown.”
Be involved in EPFL’s development

EPFL has set up a number of chairs and projects made possible only through private donations. This culture of “giving back” – deeply-rooted in Anglo-Saxon university tradition – remains largely unknown in Switzerland. Four EPFL donors share their perspectives and give us an overview of the subject.

Text: Arnaud Aubelle

The endowment from Swissquote in 2008 led to the creation of the “Swissquote Chair in Quantitative Finance”. Marc Büski (EL’87), co-founder and CEO of the bank, and his partner Paolo Buzzi (MT’88) funded the donation. “It all started with a discussion with Patrick Aebischer about our difficulty in finding financial engineers,” says Marc Büski. “The idea of a Master’s degree in financial engineering rapidly seemed to be the obvious solution.”

As with Swissquote, an endowment often begins with a donor’s intention to provide EPFL with the resources to reach its goals and a specific project. Antoine Firmenich – a board member of the fragrance giant Firmenich International – agrees: “Neuroscience is now an integral part of perfume-making, and EPFL is on the cutting edge in the field. It appeared only logical to set up our endowed chair.” Philippe Petitpierre (GR’75) has also made donations through his various energy companies, justified by the guarantee of quality from EPFL in energy, and especially in gas.

DIFFERENCE IN CULTURE

Although every donor hopes to have some indirect returns – through scientific progress or well-educated engineers who might be recruited in the future – they all reiterate that they also simply want EPFL to develop as a centre for excellence. “Our family strongly believes in both fundamental research and philanthropy. This donation was a way of killing two birds with one stone,” says Antoine Firmenich. EPFL alumni see it as a sign of recognition towards the institution that educated them and a way of taking action to see its tradition of excellence live on.

Daniel Borel (PH’73), the co-founder of Logitech, has made several donations through his company and foundations. These contributions have established two chairs financed through the Defitech Foundation, in brain-machine interfaces and clinical neuroengineering, and a chair to promote women in engineering through the swissUp foundation. His donations have also contributed to EPFL has set up a number of chairs and projects made possible only through private donations. This culture of “giving back” – deeply-rooted in Anglo-Saxon university tradition – remains largely unknown in Switzerland. Four EPFL donors share their perspectives and give us an overview of the subject.

DONATIONS TO EPFL

Today, EPFL conducts activities supported by donations from private individuals, such as those alumni mentioned here, through companies or charitable foundations. This endowment system exists at all the world’s leading universities. Donations are used to finance research projects, support for social programmes, or the construction of buildings.

Academic fundraising is becoming increasingly professional to contribute to the growth of top universities. In Europe, nearly 85% of universities use fundraising, while the practice is virtually automatic in the Anglo-Saxon model, driven by attractive tax incentives and the more highly developed culture of giving back. American alumni commonly donate a share of their gains to their alma mater.

In Switzerland, by making donations a company or individual can reduce their tax base by up to 20% of their net income, depending on the canton. Every year, EPFL signs contracts for 10 million to 100 million from sponsors, foundations and companies, while the top ten U.S. universities and colleges raise between $400 million and $930 million per year. That’s how giants such as Stanford University can work with budgets of more than $5 billion, nearly six times more than EPFL.

EPFL receives contributions ranging from 1,000 to 10,000 Swiss francs for student prizes, 100,000 Swiss francs to renovate an auditorium and up to a few million Swiss francs to sponsor a research chair (contribution to fund a laboratory), build a new building or support a high-profile school project. These donations are crucial to the school’s advancement, given Switzerland’s partial exclusion from European research budgets (Horizon 2020) and stretched public funding. Should we go further and launch a massive fundraising and endowment campaign, as suggested by Antoine Firmenich? And should Swiss tax legislation be loosened to support Switzerland’s universities and colleges?

For further information: contact Jérôme Grosse, Head of Development (jerome.grosse@epfl.ch)
the construction of the Rolex Learning Center and the Montreux Jazz Digital Project. To express his gratitude to EPFL for the education he received, Daniel Borel wanted to invest in projects he is passionate about through the school. He also stresses how important it is for EPFL to maintain total independence in its decisions. Marc Bürgi agrees: “The most important thing is not to want to influence the research with the endowment. We must ensure full academic freedom and support programmes rather than encourage them in a particular direction.”

The concept of funding the present and future development of one’s university is firmly grounded in English-speaking countries, especially the United States. But the practice is not quite as developed in Europe, and Switzerland in particular. Where does the difference come from? Daniel Borel, who also studied at Stanford, suggests a cultural divergence. “Switzerland has a stronger culture of heritage. We want to pass on the fruit of our work. That’s not so much the case in the United States, where a smaller share of your heritage is passed on to your children, and where outside donations are more common,” he says. Marc Bürgi adds: “Campus spirit is still lacking a bit. College is a very special time in the Anglo-Saxon culture, a time when you leave home to experience unforgettable and exciting things.”

The donation is a sign of recognition towards the institution that educated them and a way of taking action to see its tradition of excellence live on.

College sports, the importance of the graduation ceremony and the difficulty of entrance exams – all unique to this Anglo-Saxon culture – also contribute to that feeling of pride and attachment to their school, which are the main motivation behind any donation. Daniel Borel and Marc Bürgi also point to the fact that Swiss universities receive government funding, unlike the mostly private system in the United States. Sponsorship is not as positively perceived, even though it is essential (see inset on Sponsorship at EPFL). Antoine Firmenich blames the legal differences between Switzerland and the United States. “One of the main limitations is the lack of an endowment system in Switzerland. With this system, donations are reinvested to produce higher returns,” he says. “One of our endowments at MIT in Cambridge has generated 14% annual returns for the past 35 years, while the financial prudence of the Swiss system means you can’t achieve any more than 2% or 3%. We need a change in legislation.”

Marc Bürgi, born in 1961, has served as the CEO of Swissquote Group Holding SA and Swissquote Bank SA since 2002.

He graduated from EPFL in 1987 with a degree in electrical engineering. After working as a telecommunications specialist until 1990 at the European Space Agency (ESA) then Noordwijk (Netherlands), he co-founded and co-managed Marvel Communications Ltd. Marc Bürgi, a founding member of Swissquote, has various responsibilities on the Board of Directors and as part of the general management team.

Swissquote’s endowment in 2008 served to create the Swissquote Chair in Quantitative Finance led by Professor Damir Filipovic since 2010.
THE CHALLENGE OF SPONSORSHIP

The road ahead may still seem long, but the hope of seeing the culture of “giving back” develop in Switzerland is very real. “I’m deeply convinced of it,” says Philippe Petitpierre. “A donation is a way of identifying yourself with your alma mater, expressing your pride in having such a high quality polytechnic school.”

Daniel Borel feels that the changes at EPFL in recent years are steps in the right direction. “The campus expansion, the higher proportion of foreign students, new student housing – all that contributes to developing the sense of belonging. As does EPFL’s rise in the global rankings of top universities,” he says. Antoine Firmenich argues, “A growing number of students are going to the United States, where they discover the culture of giving back to their school. It will happen slowly, but we have reasons to hope that mindsets will develop.”

EPFL has its own role to play in bringing about this change. Philippe Petitpierre points out that Swiss companies are

DANIEL BOREL

Born in 1950, Daniel Borel holds degrees from EPFL and Stanford University. He is a co-founder of Logitech and served as the company’s chairman from 1982 to 2008. Daniel Borel created the Defitech Foundation, which supports research and development in technology used to help people with a disability, and the swissUp Foundation to promote excellence in education in Switzerland.

Logitech contributed funding for the Rolex Learning Center through a donation in 2006. Logitech was also a sponsor of the Montreux Jazz Digital Project through the Under One Roof project, presenting a donation in 2014.

SwissUp made a donation in 2007 aimed at promoting female engineers. Professor Carlotta Guiducci currently holds the swissUp Foundation Chair. Between 2008 and 2014, the endowments from the Defitech Foundation were used to establish the Defitech Foundation Chair in Brain-Machine Interface led by Professor José del R. Millán and the Defitech Foundation Clinical Neuroengineering and Human-Machine Interactions, which is currently recruiting a professor.
unfamiliar with the notion of sponsorship. “A more widespread communication campaign highlighting flexible programmes that are not limited to paying a set amount would be a good way of promoting our school and developing its sponsorship performance.”

Daniel Borel also mentions the difference in image between donors in the United States, where they are highly regarded, and in Switzerland, where successful people are basically “expected” to donate. Marc Bürgi adds: “We need programmes that acknowledge the value of donors. The donation may be entirely altruistic, but donors want to be recognised by their peers for the gift they give the school.” Donors often express their feelings of pride and sense of belonging. “That’s where the EPFL Alumni association has a fundamental role to play. Former graduates can not only identify themselves with the school but also take pride in being part of EPFL and its development,” says Philippe Petitpierre.

From there, EPFL Alumni should add that there are plenty of projects in current and future industries that might interest donors, including new campus buildings, energy, environmental protection, medical and pharmaceutical techniques and information technology (see “Every donation has its motivation inset”).

The feeling of pride and attachment to their school is the main motivation behind any donation

Is the culture of giving back to EPFL about to take off? Marc Bürgi believes that all the conditions are favourable: “Entrepreneurs, the economic fabric, success stories, the entrepreneurial spirit passed on by Patrick Aebischer to several generations of students.” Integrating what we’ve learnt from Anglo-Saxon universities while finding our own path is the sponsorship challenge for the EPFL of tomorrow.

PHILIPPE PETITPIERRE

Philippe Petitpierre graduated from EPFL with a degree in rural engineering. Today, he is the chairman of the board of directors of Holdigaz SA group companies. He also serves as chairman of Gaznat SA, Petrosvibri SA, Unigaz SA and Fingaz SA.

The endowment from Petrosvibri in 2010 went to found the Natural Gas Chair held by Professor Lyesse Laloui since 2012. Donations from Gaznat SA were used to establish two new research chairs. The Gaznat Chair to reduce CO2 emissions will be led by Professor Kumar Agrawal starting in the summer of 2016, and the Gaznat Chair in geothermal energy has been held by Brice Lecampion since June 2015.
EVERY DONATION HAS ITS MOTIVATION

Endowments, especially donations from alumni, are used to finance EPFL's growth and development in Switzerland and abroad. If you're interested in becoming a donor, here are some projects you can get involved in.

> **Major research projects:** You can either contribute to the school's large-scale scientific projects (e.g. the Venice Time Machine programme to digitise the archives of Venice and create a “Google Map of the past”) or sponsor a research laboratory (architecture, robotics, cancer, computer science, fundamental research, etc.), called “research chairs”.

> **Infrastructure:** Funding campus infrastructure means supporting the school's long-term development. One of the major projects under way is the Discovery Learning Lab. This programme aims to break down barriers between fields of study by offering students open, cross-disciplinary practical lab sessions in line with industry needs. EPFL is currently seeking funding and equipment donations to complete four of the six cross-disciplinary spaces, including two facilities devoted to prototyping. Find out more: [http://discoverylearningprogram.epfl.ch/](http://discoverylearningprogram.epfl.ch/)

> **Businesses in developing countries:** In 2014, two-thirds of the world's population did not have access to basic medical technology. This observation prompted several programmes developed at EPFL. Our scientists are currently working on projects including access to low-cost X-ray equipment in Africa (GlobalDiagnostiX project), incubator prototypes that maintain temperatures during power cuts (GlobalNeonat project) or the development of new protective equipment for people working with Ebola patients (Ebola - Smart PPE project). To help EPFL support disadvantaged countries through innovative technology, you can learn more at: [http://cooperation.epfl.ch/essential-en](http://cooperation.epfl.ch/essential-en)

> **Supporting young people:** EPFL currently offers several programmes to invest in future talent. The science outreach programme plays a key role in promoting science and technology among young people. The Euler Foundation supports children with high mathematics potential in their personal development. The WISH Foundation encourages the involvement of women on campus and in research at EPFL by offering grants to top female students who want to do an exchange programme with a foreign university. Find out more about programmes that promote careers in engineering: [http://sps.epfl.ch/](http://sps.epfl.ch/)  
[http://euler.epfl.ch/](http://euler.epfl.ch/)  

Are you interested or would you simply like more information? Don't hesitate to contact Annelies Garcia, director of EPFL Alumni: [annelies.garcia@epfl.ch](mailto:annelies.garcia@epfl.ch) or +41 21 693 20 70.
Microengineering

These four alumni from the Microengineering section have something in common: a passion for innovation. With degrees earned between 1985 and 2012, they discuss where their careers have taken them.

Leïla Hussein

“I SUPPORT COMPANIES IN THEIR DIGITAL TRANSITION”

“Rigour, logic and the ability to see the big picture are what I learnt and retained from the five years I spent at the EPFL. I didn’t just acquire knowledge. My studies shaped the way I think. I remember it being a very intellectually stimulating period. Life was hectic, between my classes and sharing my living space with seven other people. Fresh out of school in 1996, I was fortunate enough to work with Toshiba in Japan for one year. It was an unforgettable experience.

In the early 2000s, I redirected my career towards the computer industry. It’s an exciting field in our times of digital revolution. And I enjoy playing a role in this change. In 2005 I joined Microsoft, where I held several sales positions before going on to manage strategic partners. I support companies in their digital transformation. Microsoft has recently begun hiring new talent at the Forum EPFL career fair. That gives me a chance to come back to where it all began for me.”

frederic.nodl@alumni.epfl.ch

Frédéric Nödl, 1996
Partner Manager at Microsoft, Geneva, Switzerland

“I GOT INVOLVED IN MANAGEMENT”

“I completed many projects and group assignments during my Master’s in microengineering. That’s probably, where I learnt the most about being responsible for a product, working with different kinds of people and handling unexpected challenges. These skills are essential in my day-to-day work. Of course, when we weren’t studying, we would spend time relaxing with friends at the Satellite bar on campus.

After graduating in 2007, I worked at Nissan in Japan for four years. When I was 28, I wanted to get involved in management to oversee the development of a product from A to Z. I obtained an MBA in innovation management and product development before joining Amazon. For the past year, I’ve been responsible for the online promotions and events platform. I created it with my team of designers and developers. Learning about the entire product design cycle at the EPFL has been incredibly useful in implementing a long-term strategy.”

celine.ramoni@alumni.epfl.ch

Céline Ramoni, 2007
Production Manager at Amazon, Seattle, United States

Alumnist Section
“I WORK WITH ACADEMIA”

PHILIPPE FISCHER, 1985
Director of the Swiss Foundation for Research in Microtechnology, Neuchâtel, Switzerland

“I completed my degree at EPFL 30 years ago. I remember the campus back in the day: it was still very small. When I see what it has become today, it almost makes me want to go back! In the 1980s when I started my university education, no one really knew what microengineering was. Even I began the course thinking I’d be studying high-precision mechanics.

After graduating in 1985, I was hired as an electronics engineer at Mettler-Toledo. I had to be operational very soon afterwards. Fortunately, my studies provided me with a quick response capacity. I was used to spending hours searching, testing and starting over until I found a solution. Today, I run the Swiss Foundation for Research in Microtechnology. I no longer do any research, but I attend many conferences and keep up to date with the latest technological advances. I also maintain close relations with the academic world, especially with former professors.”

philippe.fischer@alumni.epfl.ch

“I’VE BECOME AN EXPERT IN FIELDS RANGING FROM ROBOTICS TO PRODUCTION TECHNIQUES”

STELLA TSAKAM, 2012
Continuous Improvement Project Manager at Richemont, Geneva, Switzerland

“I’ve become an expert in fields ranging from robotics to production techniques.”

stella.tsakam@alumni.epfl.ch

“M y six years at EPFL really opened my eyes to the world. After specialising in Asian industry, I went to India and China for one month to study the industrial approach and work methods in these two countries. That experience taught me many valuable lessons. Now I work with people from all over the world every day. What I learnt on that trip remains tremendously useful.

After a position with Audemars Piguet, I joined the Richemont group in 2014 as the project manager for continuous improvement. I work with all the departments towards improving company performance. Thanks to the multidisciplinary aspect of my studies, I’ve become an expert in a variety of areas, ranging from robotics to production techniques. This broad knowledge of the different departments that make up the company helps me better understand what my colleagues need and swiftly respond to those needs.”

stella.tsakam@alumni.epfl.ch
Solar Impulse is the culmination of Bertrand Piccard’s vision and André Borschberg’s passion for aviation and innovation. This duo forms the perfect team to get the project off the ground and develop it successfully. Combining the strengths of his engineering degree from EPFL and his Master in Management, André Borschberg set up the company, oversaw the construction of the solar aeroplane prototype and planned the flight missions.

“I am superstitious”

André Borschberg

Determination
Listening skills
Spontaneity
To be oneself
Impatient
Trying something new
What I live now
I can’t write it down, as superstitious
Happy as I am
Besides Switzerland, California
Migrating Bird
Antoine de Saint-Exupéry
I do not read poetry anymore
Tintin
Léonard Cohen
Félix Vallotton, Balthus, Paul Klee
Mikhaïl Gorbachev, Mustafa Kemal
Amelia Earhart
Bragging
Dictators, Joseph Staline, Adolf Hitler
Remembrance Day
Female voting rights
Music
Doing what I love
A bit too much in the future
To make mistakes
Trying, daring, making attempt
Electrical Engineering Class of 1992
Where are they now?

AMINE Tazzi-Riffi
45
Geneva, Switzerland

"After my degree, I left to study at MIT in Cambridge, near Boston. The school is nicknamed ‘EPFL’s big sister’. I completed a Master’s in electrical engineering and computer science in 1994. I excelled, which made me appreciate the quality of the education provided at EPFL. In 1995, I got an MBA at INSEAD in Paris. I began working for the consulting firm McKinsey in 1996, first in Zurich and then in Geneva. Four years later, I was named partner, the youngest in the company’s history! Since then, I’ve set up a McKinsey office in North Africa and continue to oversee the firm’s expansion in Africa.”

Lucie Baillon
49
Geneva, Switzerland

"Out of 80 students, two of us were women. It wasn’t easy. I felt lonely and had a hard time fitting in. Despite all that, I stayed at EPFL as an assistant after getting my degree. Even then, I knew that I’d be working in acoustics. I started a dissertation with the Laboratory of Construction Materials and spent one year in the United States working on it. When I returned to Switzerland, I worked with acoustic engineering consultants and in the environmental sector. Since 2008, I’ve been working as head of the Public Buildings, Events and Non-ionising Radiation sector at the Department of the Environment, Transportation and Agriculture of the Canton of Geneva.”

In 1992, the economic crisis was beginning to unfold. The electrical engineering students of the time nevertheless recalled a wonderful atmosphere around graduation time, including camping out in the labs, getting assignments in on time, and going on recreational outings in the mountains. They remember a rapidly growing school, though different from the current one, if only in the number of students and computer resources available. These graduates went on to pursue careers in a wide range of fields, from digitalization to social entrepreneurship, IT, energy services and acoustics.

Text: Laura Hunter
NICOLAS THÉVOZ
48
PAYERNE, SWITZERLAND

“After graduation, I started out as a research assistant at EPFL, and then left on a trip around the world. At times I was tempted to switch careers and become a mountain guide, but after returning to Switzerland I resumed academic research.

After that, I worked in software development for three years at the Swiss telecommunications company Aecom, based in Bern, before joining Swisscom as team manager for 17 years. I also did Process Engineering and service development.

On May 1, 2015, I became CEO of CC Energie, the first Swiss energy services platform.”

MAXIME MARINI
47
HSINCHU, TAIWAN

“As a student at EPFL, I went on a trainee programme in India, which made me want to work abroad. After graduation, I remained at the school for a few months as an assistant, and then worked at Swatch Group in Test Engineering. That is where I got used to working in high-volume production.

In 1996, I joined the group Logitech and have remained there ever since. I worked in Asia as head of OEM products (keyboards, mice, etc.) for ten years before returning to Switzerland in 2008. Since June, I’ve mainly been living in Taiwan, where I am Vice President of Engineering and Site Director. I believe it’s extremely important to look beyond our borders.”

DAMIEN CORTI
47
GENEVA, SWITZERLAND

“After graduation, I studied English in the United States and German in German-speaking Switzerland. I worked for three years as an engineer developing circuits and then on the planning of the Natel D mobile networks for two years. After that, I joined Radio Télévision Suisse (RTS), where I still work today. I’ve held positions there as project manager and head of engineering and am currently Chief Technical Officer.

Most of my work focuses on digitalizing RTS alongside my German- and Italian-speaking Swiss counterparts. As life has its little quirks, RTS will be moving onto the EPFL site in 2020… Nearly 30 years later, I’ll be returning to the place where this picture was taken!”

This photo was taken on January 22, 1992, at the Collège Propédeutique at the University of Lausanne.
A look at living cells down to the molecule

EPFL scientists have produced footage of living cells by integrating the technology of two microscopes.

By combining two cutting-edge microscopy techniques into one instrument, researchers at EPFL’s Institute of Bioengineering have captured images of living cells with unprecedented resolution. The scientists have even been able to observe the evolution of the cells’ structure and molecular characteristics.

The secret is in combining the images produced by two very advanced technologies. The new device is composed of a high-speed atomic force microscope (AFM) — an instrument that “feels” the surface being observed using a tiny force sensitive needle — and a single molecule localization microscope, a technique that earned its inventors the Nobel Prize last year. Special software developed by researchers assembles the images from the two instruments to give a precise, 3D visualisation of the observed sample.

“The AFM can be used to see the 3D structure of the cell in nanoscale resolution,” says Pascal Odermatt, a PhD student at EPFL’s Laboratory of Bio- and Nano-instrumentation, directed by Georg Fantner. “But it cannot see the nature of the molecules inside the cell.” The second technology, known as PALM (photo-activated light microscopy), uses contrast to make selected molecules blink on and off and then follows their path inside the cell. By uniting the best of these two worlds, the scientists can put super-resolution images of specific proteins into the structural context of the cells.

After taking successive images of the same living cell, the scientists were able to, for the first time ever, follow the behaviour of protein clusters in relation to the 3D structure of the cell.

The EPFL-built system is still a prototype but has already attracted the interest of the scientific community as well as a leading microscope manufacturer.
A giant Pac-Man to gobble up space debris

The CleanSpace One project has reached a milestone. The space clean-up satellite will deploy a conical net to capture the small SwissCube satellite before destroying it in the atmosphere.

Text: Sarah Perrin

The SwissCube satellite has been in Earth’s orbit for more than five years. But there was no reason why it should become just another piece of space junk. Engineers from eSpace, EPFL’s Center for Space Engineering and Signal Processing’s Laboratory (LTS 5), and partners from the University of Applied Sciences Western Switzerland are confident they can meet this challenge with CleanSpace One (CSO). For the past three years, they have been working on a space clean-up satellite that will be sent into orbit to catch SwissCube in its net. The two will then combust together in outer space. To reach this development milestone, the engineers have had to make critical decisions on the design of CSO’s approach and capture systems.

Space debris runs the gamut from broken down satellites to random tools floating around. Orbiting around our planet at a speed of 7 km/second, this space junk can turn into powerful projectiles and constitutes a serious threat to the devices and people working in space. Many players in related scientific fields are currently working on long-term solutions to collect and eliminate all that waste. And it’s a tougher job than one might think...

“SwissCube is not only a 10 cm by 10 cm object that’s tricky to grasp, but it also has darker and lighter parts that reflect sunlight differently,” explains Christophe Paccolat, a PhD student working at LTS5. “These variations can distort the estimates of its direction and rotation speed.” Muriel Richard-Noca, head of the project, emphasizes the extreme delicacy of the mission: “It only takes one error in calculating the approach for SwissCube to bounce off CleanSpace One and rocket out into space.” To avoid these kinds of disasters, the visual approach algorithms on the clean-up satellite’s cameras are currently going through tests.

To design the most efficient capture system, the engineers worked hand in hand with micro-engineering students from Hepia Geneva, who came up with various solutions, from articulated arms with claws to a system of tentacles. They finally opted for the so-called “Pac-Man” solution. The prototype resembles a cone-shaped net that unfolds and then claps back down once it has imprisoned the satellite. The next stage will combine the development of the first version of the engineering models and more extensive tests.
The Garden Party is a unique opportunity for Alumni to get an update on the latest developments and the main strategic projects of the School by EPFL leadership team. Besides EPFL President and vice-presidents, the event is attended by representatives of EPFL’s major initiatives.

This year, the event addressed the topic of digital transition with the presence of Professor Pierre Dillenbourg, who leads the Center for Digital Education in charge of creating EPFL MOOCS. Other external experts of the digital industry joined the discussion, including Dominique Mégret, head of Swisscom Ventures and Philippe Cina, delegate of the CEO of the Swiss Post for the Mobility Lab Sion-Valais.

The Garden Party also serves as a networking platform between EPFL and its alumni active in various industries. The 2015 Alumni Gold contributors hold executive positions in the construction, life sciences, energy, finance or healthcare sectors, among others. They can therefore share the current opportunities and challenges of their industry with EPFL’s leadership while finding out about the School’s initiatives in their field.

EPFL president Patrick Aebischer and the vice presidents of the school met the alumni Gold contributors as part of the first Garden Party organized on September 8, 2015 at the Bois Chamblard residence.

Upper left, alumni and the EPFL team gathered at Bois Chamblard. Above: Ludovia Visciola (SV 12) and Claude Fiorin (EL 82.) Left: Francois Gabela (GM 82), LEM CEO, in front with Eric Merk, head of fundraising at EPFL and Odile Batty, former president of EPFL Alumni, her back to the camera.
Patrick Aebischer, EPFL president, talked about the school with the alumni Gold contributors.

Professor Pierre Dillenbourg, a MOOC expert (left), Michael Thémans, deputy vice-president of EPFL and Dominique Mégret, Swisscom Ventures director (above), highlighted the potential of digital, especially in education and transportation.

For more information about the Garden Party and the Gold contribution, visit our website, www.epflalumni.ch/fr/avantages.
What are today’s most exciting technical and scientific breakthroughs? And how will they impact our lives? Alumnist asks the most eminent scientists at EPFL.

Leading organisations, such as the World Economic Forum, and auditing and consulting firms like Deloitte, Gartner and PricewaterhouseCoopers regularly publish their rankings of our most promising technical and scientific advances. In this report for Alumnist magazine, we reviewed these different rankings and selected ten technologies that apply to a broad range of areas, such as manufacturing, transportation, economy, health, food, etc. We submitted our selection to the discriminating eye of experts, most of whom are professors or researchers at EPFL.

The impact of this technological progress on all aspects of our lives is already impressive, but it is likely to be even more spectacular in the years to come. What’s most striking is how fast these changes are hitting us. Driverless vehicles, which seemed unfathomable just ten years ago, are already cruising around the EPFL campus. And the collaborative economy, which represented $15 billion in 2014, is expected to exceed $335 billion in ten years.

From connected objects to nanoparticles to genetic engineering and nutrigenomics, we explain here why these ten technologies are going to change the world.

Séverine Géroudet, Gabrielle Cottier, Leila Hussein and Thomas Plefferlé

Photos: Vincent Calmel
Extremely customisable, more lightweight, elastic, biocompatible and environmentally-friendly, nanoparticles have been used to create a new generation of materials, such as bioplastics and smart concrete. “It’s a very advanced area of research,” says Sandrine Gerber, a professor at the Laboratory of synthesis and natural products and head of the Group for functionalized biomaterials at EPFL. “These new materials have led to major advances in a variety of areas. In construction, nanoparticles have been used to improve building resistance, insulation, water resistance, energy savings, etc.”

In health and medicine, biomaterials have spurred spectacular progress. Already commonly used to develop artificial blood vessels, dental implants and prostheses for hips and joints, nanoparticles still carry vast potential. “Research is placing great hope in nanomedicine,” says Sandrine Gerber, who is currently working on nanoscopic and microscopic biomaterials. “For example, nanoparticles can be used to limit the side effects of a drug. They coat the active ingredient to deliver it as close as possible to its target. This process is effective for anti-cancer drugs, which are often toxic for the rest of the organism,” she explains. “In cell transplantation, polymer microcapsules are used to isolate cells of the immune system and protect them.” This therapeutic targeting is in line with the shift towards personalised medicine and is expected to lead to the development of new treatments.

Internet of Things
Moving Towards 80 Billion Connected Objects

The “Internet of Things” is made up of objects embedded with chips or sensors that offer network connectivity either to the Internet or other objects. These “things” are now everywhere, exploding in number from less than 1 million just ten short years ago to more than 15 billion worldwide. And they’re not stopping there. Forecasts from Gartner and Idate, two research and consulting firms specialised in the technology market, estimate between 30 billion and 80 billion of them by 2020.

“This phenomenon affects all areas of industry, forcing companies to adapt,” says Philippe Fischer, director of the Swiss Foundation for Research in Microtechnology. “Watchmaking is the perfect example.” The launch of the Apple Watch pushed watch brands – typically ultra-traditional – like Montblanc and Breitling to develop their own “connected” models. For now, connected objects send the data to different types of terminals. But the specialist expects that “over the next five years, information will converge to smartphones and tablets.” The Internet of Things is touted by marketers as making life easier – for example a refrigerator that generates a shopping list when it’s empty – but it brings new risks. “Users’ personal information is collected and stored online, meaning it can be misused. The threat of Big Brother-type drifts is real.”

Further reading
Originally dating back to the 1980s, additive manufacturing, or 3D printing, is exploding today thanks to digital technology and the Internet. Experts predict that this technology is the next industrial revolution. "Unlike the traditional production method of machining – a so-called 'subtractive' process, meaning that material is removed to create a part – additive manufacturing generates little or no waste," says Professor Andreas Mortensen, director of the Laboratory of Mechanical Metallurgy at EPFL. "We go directly from a digital file to a finished product, with the advantages of saving time and sometimes money." Companies have understood that additive manufacturing speeds up prototyping and slashes the time it takes to get a new product to market. The technology is already widespread in industries such as aviation. In medicine it is used to create personalised implants using scanners.

With the development of renewable energy such as solar and wind power, electrical grids are forced to adapt. This new green energy – highly variable and random due to its dependency on weather conditions – is not easy to integrate into existing grids, which were built to absorb a virtually constant energy supply. Transforming electrical grids represents more than a technical challenge. It is also an economic one.

"To smooth out fluctuations in solar and wind energy supply, electricity companies have to rely on additional generators, and many of those run on oil or gas," says Professor Jean-Yves Le Boudec, co-director of the EPFL Smart Grid project. "However, these generators compromise profitability, as they are only used intermittently."

One of the measures in the Smart Grid system is to provide homes with smart meters. That way, consumers know in advance when electricity is most expensive and can adjust their energy consumption. "Systems have already been tested in numerous countries, including Switzerland, to adapt demand to supply and therefore reduce electricity companies’ costs of using additional generators."

The EPFL Smart Grid is testing another approach. This system uses only renewable energy and is automatically balanced by decentralising production from the solar and wind power units operated by companies and individuals.

Further reading
ROBOTICS
OF ROBOTS AND MEN

A prosthesis that senses the movement that its wearer would like to make. A car that drives itself. A complex step in an industrial production process. Robots are everywhere and are getting better at what they do. “The difference between robots and other machines is their level of autonomy,” says Aude Billard, a professor at EPFL’s Learning Algorithms and Systems Laboratory. “It can adapt its decisions to the circumstances of an unpredictable environment.” Research is advancing quickly, and the robots of the future will integrate a growing number of parameters. “In manufacturing, they will soon work directly with human beings, helping them to transport and design objects. The potential of this human-robot interaction is huge, but carries its own set of problems.”

Technical challenges remain, as disruptions are still common. Then, the question of legal liability becomes more complex in the case of an accident involving a human and a robot. Focus moves to issues that arise when, for example, a driverless vehicle causes a fatal accident due to a rational decision made by a computer? And the most sensitive area is ethics. While we are delighted with the progress that makes our day-to-day lives easier, we also live with a palpable fear that robots could one day replace humans and radically change how certain jobs are performed.

Further reading

GENETIC ENGINEERING
CUTTING AND PASTING DNA

In just 20 years, the ability to modify DNA has gone from a rare and laborious event to a frequent and efficient occurrence. In 2012, a technique called CRISPR-Cas9 was developed and has since spread to virtually all biology laboratories. This process is used to isolate a specific segment of the DNA sequence for editing. In cases of genetic disease or gene deregulation in cancer, DNA can be repaired by replacing the organism’s defective gene. Healing then takes place on its own.

“If you put it bluntly, it means that we can now modify a living organism’s genetic code,” Prof. Denis Duboule from EPFL says. “CRISPR-Cas9 offers enormous potential for medicine and could eventually be applied to preventing, diagnosing and treating disease. We will soon be able to harvest a cell, for example from bone marrow in a leukaemia patient, repair it and reinsert it, like in a transplant,” he explains. “For now we’re still looking at possible side effects, but we can expect this technology to spread to new treatments over the next few years.”

With its potential ranging from healing cancer to identifying genetic diseases in an embryo, the development of CRISPR-Cas9 and its future application raise issues that overstep the bounds of academicians. The debate is at the level of all society. The scientist believes that this is a pivotal time, when science fiction is on the verge of becoming reality. “Society will have to steer through this transition from an ethical point of view.”

Further reading
Stéphane Foucart, “Éditer la nature”, in Le Monde, 31.08.2015.
The computers that we use today are completely pre-programmed, limiting what they can do," says Christophe Gamrat, a researcher from the French Alternative Energies and Atomic Energy Commission. "Programming is inevitably restricted to certain areas and specific tasks. Machines with neuromorphic systems become more autonomous by reacting and adapting to their environment."

To develop computers that can learn and mimic human behaviour, scientists are attempting to simulate the interaction of biological neurons. The technology used to build neuromorphic systems has countless applications in visual and sound recognition and in robotics, including facial recognition, instant translation, autonomous robots and space exploration.

Today, research projects are under way all over the world. EPFL is home to the famous Human Brain Project. The HBP’s overarching aim is to develop new computing technologies based on a detailed understanding of how the human brain functions. The SyNAPSE project in the United States, led by IBM and funded by Darpa, was launched to develop neuromorphic chips to be used in smartphones.

In Switzerland on the EPFL campus, the autonomous and driverless vehicle CityMobil2 successfully completed its test phase at the end of August 2015. Equipped with sensors and programmed to stop at different areas on the campus, the smart minibus demonstrates how far this technology has come.

“This type of vehicle is likely to develop significantly over the next few years,” says Philippe Cina, co-ordinator of the Mobility Lab Sion-Valais, a project aimed at testing innovative mobility solutions jointly led by Swiss Post, the Canton of Valais, the city of Sion, EPFL and the University of Applied Sciences Western Switzerland (HES-SO) Valais. “People are investing more in city centres but don’t want them cluttered with cars. And driverless public transport vehicles are an ideal solution for that trend in urban development.”

In early 2016, this new type of transportation will be tested in a public area for the first time by PostBus in the city centre of Sion. The pilot project involves operating two driverless minibuses over short distances to provide the Valais capital with a new means of public transport. Similar projects are also set for launch in France, Germany and the United Kingdom in 2016. “At the same time, progress with individual vehicles is also expected to optimise and improve the flow of road traffic on expressways while boosting safety over the next 10 to 15 years.”

Meanwhile, Swisscom is testing an autonomous vehicle in Zurich. A special authorisation allows the operator to run trials until the end of the year on certain sections of city streets.

Further reading

Further reading
The sharing economy is a sociological phenomenon, the result of our changing consumption and production habits,” says Marc Gruber, head of the Chair of Entrepreneurship and Technology Commercialization at EPFL. Building on new possibilities offered by the Internet, social media and smartphones, this shift encourages citizens and consumers to work together by pooling resources. In the sharing economy, ownership is no longer important, but access to products and services is. “The democratic approach to production in collaborative consumption emancipates potential consumers and entrepreneurs. Anyone can become a producer and bring something to the rest of the community.”

Airbnb alone embodies the success of this new trend. In 2014, the accommodation rental platform recorded 10 million reservations between hosts and guests. The sharing economy has already spread to transport, with ride sharing and Uber’s taxi service, and financing, with crowdfunding. And it will continue to gain ground. “In the future, other sectors will open up to collaborative consumption, extending to services such as meals, home repairs and education.” The parallel economy will force traditional companies to re-examine and reinvent themselves. “The sharing economy is a disruptive model that will cause the previous model to disappear.”

“Nutrigenomics is both a preventive and curative approach, aiming to help people to live longer, healthier lives. And the social and sensory pleasure of eating won’t disappear.”

Nutrigenomics focuses on building our knowledge of the interaction between nutrients and our genes to solve these problems of metabolism. The development of this science could eventually lead to personalised diets, also dubbed “precision nutrition”. “Nutrigenomics can help population groups that lack abundant food by determining which nutrients are essential to their metabolism.” That task is not so easy. “We have nearly 20,000 different genes, but only some of them are linked to nutrition. We have to target those genes and understand how they function. I’m an optimist, and research moves forward. We’ll get there in a few years.” With the development of mainstream sequencing, everyone will soon know what genes they have. Using that information, nutrigenomics can be used to adapt nutrition to each individual or even offer in-store food selections designed for a given genome. “Nutrigenomics is both a preventive and curative approach, aiming to help people to live longer, healthier lives. And the social and sensory pleasure of eating won’t disappear.”
Today, 75% of EPFL graduates work in Switzerland. This infographic presents an overview of the main employers of the school’s alumni in 2015 and the main geographical hubs where they work. Geneva, Lausanne and the north shore of Lake Geneva continue to attract most of EPFL’s engineers. Zurich, Bern and Basel also have high concentrations of EPFL alumni. The three major Swiss and international groups – Nestlé, Elca Informatique and Philip Morris – are currently the main private employers of EPFL alumni. A number of public bodies (Swiss federal government, government of the Canton of Vaud) and especially universities (UNIL, ETHZ) also currently employ more than 100 former EPFL students.
All Swiss employers were included except for EPFL itself. This infographic was designed based on data available on LinkedIn and in the alumni database as of October 15th, 2015. Please keep your information in our database up to date for our future statistics. You can now try our new, easy-to-use function available on our website that automatically synchronises your information on LinkedIn with your profile on the EPFL Alumni website. Check it out!
**Calendrier 2016**

**Janvier**

**Événement de curling à Wallisellen**

Janvier 22

Le chapitre Suisse oriental de l’EPFL Alumni invite ses membres à un événement ludique pour apprendre à jouer au curling. Toutes les détails sont disponibles sur notre site web.

**Février**

**Dîner sur le crowdfunding**

Février 9

Organisé par le chapitre Vaud-Valais en partenariat avec EHL et HEC Lausanne, ce dîner donne l’opportunité de discuter de ce mode de financement révolutionnaire qui transforme la façon dont nous finançons les projets. Toutes les informations pratiques seront bientôt disponibles sur notre site web.

**Mars**

**Visite de Sonova**

Février 10

Cet événement organisé par le chapitre Suisse oriental de l’EPFL Alumni offre la possibilité de visiter la société Sonova, un leader mondial du marché des implants auditifs, avec ses bureaux centraux à Zurich.

**Mars 8**

Peter Maurer, président du Comité international de la Croix-Rouge (ICRC) depuis 2012, viendra faire un discours au Forum Rolex de l’EPFL.

**Mai**

**Balelec**

Mai 13

L’événement que vous ne pouvez pas manquer ! Comme chaque année, le festival de musique EPFL accueillera environ 20 concerts sur ses cinq différentes scènes.

**Impressum**

It is distributed along with Technologist, the European science magazine published by EuroTech Universities, which includes EPFL.

** конечно, я могу прочитать и понять текст на русском языке. **

**Календарь 2016**

**Январь**

**Колл-энтовент в Уоллисельлен**

Январь 22

Северный швейцарский отдел EPFL Alumni приглашает своих членов на веселый событие, чтобы научиться играть в керлинг. Во всех подробностях на нашем веб-сайте.

**Февраль**

**Обед на краудфундинге**

Февраль 9

Организованный совместно с EHL и HEC Lausanne, открытие конференции дает возможность обсудить эту форму финансирования, которая революционизирует то, как мы финансируем проекты. Все практические детали будут доступны в ближайшее время на нашем веб-сайте.

**Март**

**Посещение Sonova**

Февраль 10

Это мероприятие организовано швейцарским отделом EPFL Alumni предоставляет возможность посетить Sonova, ведущего производителя слуховых протезов с штаб-квартирой в Цюрихе.

**Март 8**

Пётр Маргер, президент Комитета Международного Комитета Красного Креста (ККК) с 2012 года, приедет выступить на ролландском форуме EPFL.

**Май**

**Balelec**

Май 13

Это событие, которое вы не должны пропустить! Каждый год, EPFL-фестиваль музыки откроет примерно 20 концертов на своих пяти различных площадках.

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**Итак, я могу прочитать и понимать текст на русском языке.**
Faculty Position in Mechanical Engineering

The Institute of Mechanical Engineering is soliciting applications for a faculty position at the level of tenure-track assistant professor or (tenured) associate professor in any discipline in the field of mechanical engineering.

Of particular interest for this search are applicants who perform experimental research. Areas of specific technical interest include but not limited to new energy conversion and storage technologies, thermodynamics, advanced manufacturing, applied solid mechanics, metamaterials, and heat/mass transfer. Applicants should have a demonstrated record of excellence in their chosen technical area.

As a faculty member of the School of Engineering, the successful candidate will be expected to initiate an independent and creative research program and participate in undergraduate and graduate teaching. Internationally competitive salaries, start-up resources and benefits are offered.

EPFL, with its main campus located in Lausanne, Switzerland, is a internationally competitive salaries, start-up resources and benefits are offered.

EPFL, with its main campus located in Lausanne, Switzerland, is a dynamically growing and well-funded institution fostering excellence and diversity. As a technical university covering essentially the entire palette of engineering and science, EPFL offers a fertile environment for research cooperation between different disciplines. EPFL has a highly international environment that is multi-lingual and multi-cultural, with English often serving as a common interface.

Applications should include a cover letter with a statement of motivation, curriculum vita, list of publications and patents, concise statement of research and teaching interests. Applicants for assistant professor should request five letters of recommendation to be uploaded to the recruitment web site, while applicants for associate professor should provide the names and addresses of at least five potential recommenders. Applications must be uploaded in PDF format to the recruitment web site: http://go.epfl.ch/igm-search

Enquiries may be addressed to: Prof. William Curtin Search Committee Chair igm-solid@epfl.ch

For additional information on EPFL, please consult the web sites: www.epfl.ch, sti.epfl.ch and igm.epfl.ch

Faculty Position in Solid Mechanics

The Institute of Mechanical Engineering is soliciting applications for a faculty position at the level of tenure-track assistant professor or (tenured) associate professor for researchers with interests in Solid Mechanics.

Researchers working in any areas of solid mechanics – including but not limited to nano-mechanics, mechanics of energy storage materials, metamaterials, soft materials, and biomaterials – are encouraged to apply. The Institute has a particular interest in experimental research. Applicants should have a demonstrated record of achievement in the field.

As a faculty member of the School of Engineering, the successful candidate will be expected to initiate an independent and creative research program and participate in undergraduate and graduate teaching. Internationally competitive salaries, start-up resources and benefits are offered.

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Faculty Position in Data Science and Machine Learning

The School of Computer and Communication Sciences at EPFL invites applications for faculty positions in computer and communication sciences. We are seeking candidates for tenure-track assistant professor as well as for senior positions.

Successful candidates will develop an independent and creative research program, participate in both undergraduate and graduate teaching, and supervise PhD students.

The school is seeking candidates in the fields of data science and machine learning, including application of these techniques in natural language processing, speech recognition, information retrieval, and similar fields.

EPFL offers internationally competitive salaries, significant start-up resources, and outstanding research infrastructure.

To apply, please follow the application procedure at https://academicjobsonline.org/ajo/jobs/6192

The following documents are requested in PDF format: cover letter, curriculum vitae including publication list, brief statements of research and teaching interests, names and addresses (including e-mail) of 3 references for junior positions and 6 for senior positions. Screening will start on December 1, 2015.

Further questions can be addressed to: Prof. James Larus Dean of the School of Computer and Communication Sciences EPFL CH-1015 Lausanne recruiting.ic@epfl.ch

For additional information on EPFL, please consult the web sites: www.epfl.ch, sti.epfl.ch and igm.epfl.ch

To contact the Search Committee Chair: Prof. John Botnis Search Committee Chair igm-search@epfl.ch

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EPFL is committed to increasing the diversity of its faculty, and strongly encourages women to apply.

EPFL is an equal opportunity employer.
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