PROFILE
Swissquote, an EPFL success story

EPFL celebrates its 50th anniversary \( \Rightarrow \) p.11
Teaching machines to learn \( \Rightarrow \) p.26
Vos idées vous appartiennent
Nous vous aidons à les protéger

Brevets
Marques
Designs
Veille technologique
Dear alumni,

I’m delighted to present you with the latest issue of Alumnist, which we’ve enjoyed putting together to bring you the latest news from your school and network.

First things first, we’ve put the spotlight on excellence, with an exclusive interview featuring two of our “star” alumni, Marc Büschi (EL’87) and Paolo Buzzi (MT’88), the co-founders of Swissquote, a real success story straight out of EPFL. We’ve also covered the highlights from the 2018 “Magistrale”, which has brought another 1,043 graduates into our community. It was a beautiful celebration where two talented alumnae, Pauline Baumgartner-Harris (CH’97) and Déborah Heintze (SV’12) received an Alumni Award and where Daniel Borel (PH’73) captivated the audience with the exciting tale of how he set up Logitech.

Technology and innovation are also key themes in this issue, with a special report on machine learning. Pivotal in the digital revolution, machine learning has become an important focus in teaching EPFL’s future talent and is an area where some of you play an essential role in your organisation. You can also read about Hyperloop, the new mode of transportation that is inspiring all sorts of emotions, even right here on our campus. The EPFL team that worked on the project landed an impressive third place in the latest Hyperloop Pod Competition in California. And finally, startups founded by EPFL graduates are more than ever making their mark. Between revolutionary technologies and outstanding fundraising campaigns, Alumnist covers some of the biggest triumphs in recent months.

Ringing in the end of 2018 is the perfect occasion to thank the many graduates who have been involved in the community, who contribute to building the relationship of mutual support that is so valuable to us all. I’m referring at the presidents of our EPFL Alumni chapters and their committees, which keep the network active in Switzerland and worldwide. I’d also like to thank the many mentors who have guided startups and career development. More specifically, the 138 alumni who volunteered to the Forum EPFL mentoring programme. From May to October, these alumni shared their precious time with graduating students to help them land an internship, a job or precious advice in choosing their career path, creating special bonds and genuine success.

The holidays are a time to recharge our batteries. We’ll need that energy to take on 2019, which promises to be an exciting year. The school will celebrate its 50th anniversary, with a key date already set. Saturday November 9th will be the “Alumni 50th”, a day devoted to us, to reconnect with your campus, section and friends, all in the presence of prestigious guests, whose names will be revealed to you shortly. Please save the date!

Until we have the pleasure of seeing you again, the entire EPFL Alumni team and I want to wish you all great success, happiness and health for 2019.
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Ghislain Bardout (GM’09)
Exploring the Deep.

Since 2015 Ghislain Bardout (GM’09), accompanied by his wife and their two children, has been exploring some of the planet’s hardest to reach places on the ocean floor. Their project, Under the Pole, is helping advance scientific research by studying underwater sea life. Ghislain Bardout is even the first person to dive deeper than 100 m under the sea ice. He is preparing a new expedition for 2019 to explore the coral reefs over 50 m below the water’s surface, an environment about which little is known in the scientific community. The media has been tracking the project passionately, especially in France. For example, the television channel Arte broadcast a documentary about Under the Pole. In June 2016, Alumnist magazine published a feature article about Ghislain Bardout (see Alumnist No. 4).

Christoph Aeschlimann
(in’01), New Head of IT at Swisscom

The current CEO of the software engineering company ERNI, Christoph Aeschlimann will become head of the IT, Network & Infrastructure Group division at Swisscom and member of the Swisscom Group Executive Board in February 2019. In its press release announcing his appointment, the telecommunications giant highlighted Christoph Aeschlimann’s “digitisation expertise” and “ability to anticipate market developments”.

EPFL Graduates Included in Forbes 30 Under 30

Forbes magazine released its 30 Under 30 list for China. This selection spotlights talented Chinese individuals under age 30, destined to become the leaders of the future. Three EPFL graduates made the Class of 2018: Dr. Zhuang Hao (PhD SC’17), CEO of HuaRui, which provides artificial intelligence solutions to enhance its customers’ products and services; Dr. Feng Jiandong (PhD SV’16), whose articles were honoured in the scientific journal Nature; and Zhai Yujia (MT’13), founder of Swissmic, a company that helps businesses upgrade their manufacturing systems. In Switzerland, Déborah Heintze (SV’12), co-founder and COO of Lunaphore, also featured on the Forbes list (see feature p.23).

Tribute to René Le Coultre (GM’41)

René Le Coultre earned his degree back in 1941, when EPFL was still called École d’ingénieurs de l’Université de Lausanne. The inventor of the quartz watch first came up with the idea of using the mineral in the design of wristwatches in 1957. He was appointed head of research and development at Rolex in 1971 before founding the Swiss Center for Electronics and Microtechnology in 1981. René Le Coultre, who passed away in August 2018 at the age of 100, was honoured in Swiss publications such as RTS, Le Temps and swissinfo, all hailing the Swiss engineer as a visionary.

EPFL Alumni Named Digital Shapers by Le Temps

In September, the daily newspaper Le Temps revealed its list of Switzerland’s 100 Digital Shapers for 2018. The selection featured many EPFL alumni, including André Kudelski (PH’84), chairman of Kudelski Group, active in electronic security; Raphaël Gindrat (GC’14), co-founder of Bestmile, which develops a fleet management system for autonomous vehicles; Grace Torrellas (EMBA’12), blockchain expert and co-founder of the Blockchain4Humanity programme; and Grégoire Ribordy (PH’95), CEO of ID Quantique, specialised in data encryption. The full list is available on Le Temps website.

Metin Arditi (PH’68) Named Commander of Arts and Letters

An EPFL graduate who earned his degree in physics in 1968, Metin Arditi has over the past several years devoted himself to writing. He has received numerous literary awards for his books, including L’Enfant qui mesurait le monde, which won the Prix Méditerranée and Prix Richelieu for French literature in 2017. In October 2018, he was appointed Commander of France’s Order of Arts and Letters by the French Minister of Culture, Franck Riester. Published in August 2018, the latest novel by Metin Arditi, Carnaval Noir, takes the reader on a journey through Venice, the Vatican and Geneva, deep into the origins of political and religious fanaticism.
THE EASTERN SWITZERLAND CHAPTER MARKS ITS 90TH ANNIVERSARY
AUGUST 26TH

EPFL Alumni’s Eastern Switzerland chapter has been celebrating its 90th anniversary in 2018. Nine decades of friendly, cultural and of course scientific events – a perfect anniversary to celebrate! For the event, more than 60 alumni met at Schartenfels Castle in Wettingen, the very spot where the EPFL Alumni Eastern Switzerland chapter was founded in 1928. Graduates participated in workshops to celebrate the highlights in the chapter’s history and watched videos specially produced for the occasion. The chapter’s future activities were also on the agenda at the event, where alumni were able to chat and socialise. Happy anniversary!

INNOVATION EVENT
IN PARIS
SEPTEMBER 6TH

EPFL Alumni organised a special event attended by Professor Marc Gruber, vice president for innovation at EPFL; Jean-Philippe Lallement, managing director of EPFL Innovation Park; and Lan Zuo Gillet, programme director at Innosuisse. Innovation leaders gathered to listen to pitches by four startups, three of which were from EPFL. The event also provided the opportunity for alumni to get back in touch and resume activity at the Paris chapter, led by a fresh committee. More events in Paris and the region coming soon!
EPFL celebrates its 1,043 new graduates

The 2018 graduation ceremony honoured the School’s alumni. In addition to celebrating 1,043 fresh graduates, EPFL presented Alumni Awards to Pauline Baumgartner-Harris (CH’97) and Déborah Heintze (SV’12). Notable alumnus Daniel Borel (PH’73), co-founder of Logitech, shared his experience and viewpoints with the audience.

They had been waiting for five years! Finally the day came on October 6th 2018, when 1,043 students received their Master’s degrees. Held at the SwissTech Convention Center, the event was attended by some 3,000 guests. EPFL President Martin Vetterli took the opportunity to stress how young graduates have the power to influence the world we live in. “We are innovators and risk takers and knowledge entrepreneurs,” he said. “With your degree in your back pocket, the world is at your feet. But never forget: the planet is in your hands.”

The ceremony honoured students with outstanding academic performances, as well as their teachers. Two doctor honoris causae were also presented. The first was handed to Martine Clozel, executive vice president of Idorsia, a company that develops molecules used in innovative therapeutic treatments. The other went to Yann LeCun, head of artificial intelligence at Facebook, who is responsible for significant advances in machine learning (see report, p.26).

ALUMNI TAKE CENTRE STAGE
EPFL graduates also took the spotlight with Alumni Awards given to recognise the admirable achievements of two of the school’s former students: Pauline Baumgartner-Harris (CH’97), head of intellectual property at Firmenich, and Déborah Heintze (SV’12), co-founder and COO of Lunaphore Technologies (see profiles, p.22). Another prestigious alumnus, Daniel Borel (PH’73), engaged the audience with the story of the creation of Logitech a few years after receiving his degree. He encouraged the young graduates not to be afraid to follow their passions, and to view their failures as opportunities to continue their paths with the valuable experience they have acquired.

Swiss Federal Councillor Guy Parmelin closed the ceremony with a speech. He stressed the importance of the continuous pursuit of knowledge, bearing in mind that pleasure is a powerful driver in a career and that “science is a form of personal commitment to serving the community.”
INSTAGRAM CONTEST
On the big day, graduates were invited to participate in an Instagram contest with the hashtag #MagistraleEPFL. They were asked to take a photo that best captured their experience of the event. The three happy winners were thrilled, and delighted with their brand new EPFL hoodies. Well done ladies!

Mathilde de Perrot (MX’18)
Heiva Le Blay (PH’18)
Diana De Vogel (AR’18) and friends.

Pauline Baumgartner-Harris (CH’97) and Déborah Heintze (SV’12) receive 2018 Alumni Awards.

Daniel Borel (PH’73), co-founder of Logitech, reflects back on his career.

Diana De Vogel (AR’18) and friends.

Heiva Le Blay (PH’18)

Mathilde de Perrot (MX’18)
EPFL INNOVATION PARK CELEBRATES ITS 25TH ANNIVERSARY

Opened in 1993, the EPFL Innovation Park celebrated 25 years in operation this year. Former EPFL President Bernard Vittoz was a pioneer back in 1991 when he launched the Innovation Park Foundation. His plan was to create an environment designed to stimulate innovation and the transfer of technology by bringing startups and companies close to the university campus. And his idea has been a tremendous success. Today, the site has over 2,250 employees, and is home to 26 large companies, 116 startups and more than 75 entrepreneurial projects at the incubator stage – all this right next door to a campus teeming with some 350 laboratories.

PARAPLEGIC PATIENTS REGAIN CONTROL OF THEIR MUSCLES

Three patients who suffered from spinal cord injuries years ago were able to walk again thanks to a wireless implant that triggers precise electrical stimulation. In rehabilitation sessions, the three people were able to walk using body weight support for more than a kilometre, without using their hands. In a dual study published in *Nature* and *Nature Neuroscience*, Swiss scientists Grégoire Courtine (EPFL and CHUV/UNIL) and Jocelyne Bloch (CHUV/UNIL) showed that after a few months of training, patients could control muscles in their legs even without electrical stimulation. The breakthrough was covered by major media outlets worldwide.

SCIENTASTIC KINDLES THE PUBLIC’S INTEREST IN SCIENCE

How can we make digital technology easier to understand? On November 10 and 11th 2018, EPFL opened its doors to the public with demonstrations, exhibitions, talks and workshops on the inner workings of the high-tech, connected world around us. This fifth edition of the Scientastic festival set out to help people make sense of the technology available today. Talks covered areas ranging from cryptography and molecule modelling to the use of digital technology to make skis. The event was a huge success, drawing some 17,000 people to the campus.

EPFL OPENS AN EDUCATIONAL SCIENCE CENTRE

Opened in October 2018, the LEARN centre promotes innovation in teaching to respond to the challenges brought by the digital transformation. Headed by Francesco Mondada (MT’91 and PhD IN’97), professor at EPFL’s Robotic Systems Laboratory and engineer behind the Thymio teaching robot, the centre aims to stimulate research and create new synergies. “With the spectacular advances in digital technology, what we teach and how we teach it have to adapt,” says Pierre Vanderheynst, EPFL’s vice president for Education. “The purpose of LEARN is to experiment with new teaching techniques, demonstrate their impact and transform them into innovative educational practices.” The people at the LEARN centre work at all levels of learning, from compulsory schooling to higher education.

DIGITAL DAY AT EPFL

On October 25th 2018, locations throughout Switzerland – from train stations to universities to town squares transformed into meeting spaces – joined in the digital experience for the second edition of Swiss Digital Day, an initiative coordinated by digitalswitzerland. EPFL, as a partner to the event, organised free activities open to the public. The Rolex Learning Center at the Lausanne campus was teeming with stands, workshops, scientific demonstrations and an exhibition on Data Detox. Two round tables on digitalisation in teaching took place in the late afternoon. Notable attendees included Swiss Federal Councillor Johann Schneider-Ammann and State Councillors Cesla Amarelle (Vaud), Christophe Darbellay (Valais) and Manuele Bertoli (Ticino).

CLASS OF 1973 GOES BACK TO SCHOOL

The Physics class of 1973 (photo) was back on campus for an event on October 27th. Logitech welcomed the alumni at its offices inside the Innovation Park, which was made possible by Daniel Borel, himself a PH’73 alumnus. The day began with talks from class graduates, with topics ranging from particle physics to the use of statistics in science. The event provided the opportunity to tour the campus, a radically different place from their old stomping grounds as students. Attendees were also able to visit the Rolex Learning Center and Swiss Plasma Center. A few weeks before the event, Civil Engineering graduates from the same year enjoyed a similar on-campus reunion to rekindle contact with their university and former classmates.
“Celebrating our school’s 50th anniversary and making alumni the key to its future”

EPFL President Martin Vetterli sends a message to alumni on the eve of the school’s 50th anniversary. In the spotlight are the school’s achievements and the pivotal role graduates will play in its future.

Our school is celebrating its 50th anniversary. Within a mere half-century, the École Polytechnique Fédérale de Lausanne (EPFL) has gone from a traditional engineering school to a world-renowned institute of technology. Annual higher education rankings are evidence of that. EPFL’s peers include some of the world’s top universities, which have been around much longer than 50 years. That is quite an achievement for our school, which is a teenager in comparison to some of its peers! The school’s youth is its great strength and helps us tackle the future with agility and make important advances towards its three core missions.

The first is education. We teach students to become not only top scientists and engineers but also responsible leaders. Like you, they will take on key roles. This talent must contribute to turning technological revolution into a positive revolution in society in the midst of digital transformation. And as part of the digital transformation, it is our duty to adapt our teaching methods, to continue to innovate and to act as a forerunner. One way we are doing that is by developing MOOCs, with more than 2 million people enrolled in EPFL’s Massive Open Online Courses. We have also created the Extension School and recently opened the LEARN centre focusing on innovation at all levels of education. Furthermore, project-based teaching is increasingly integrated into our programmes. Projects such as the Solar Decathlon and Hyperloop Pod Competition are fantastic ways for our students to learn, while enhancing the school’s reputation worldwide.

Our second mission is research. Research draws on and must continue to draw on talent from around the world, while building on two pillars: solid expertise in basic science and interdisciplinary collaboration whenever possible. This will be our school’s main strength. An interdisciplinary approach is now an integral part of our school, for example with bioengineering, at the crossroads of engineering science and life science. Research is carried out at our 350 laboratories and throughout EPFL’s sites beyond Lausanne: Campus Biotech in Geneva, Microcity in Neuchâtel, EPFL Valais Wallis in Sion, and the Smart Living Lab in Fribourg. We are also teaming up more with other establishments in our region, including Lausanne University Hospital (CHUV), and establishments outside Switzerland.

Finally, innovation, to promote and transfer the technology developed at our laboratories to the real economy and society. Led by a long line of visionary presidents and its Innovation Park created 25 years ago, EPFL has become a unique innovation hub. It allows young companies to flourish and thrive while developing closer ties between the school and the companies operating on-site. The strength of this ecosystem shows in the numbers. The Lake Geneva region continues to attract investors, as its startups alone currently raise nearly 50% of Switzerland’s venture capital.

This 50th anniversary celebrates the federalisation of EPFL. That is no small detail, as more than 90% of our budget comes from federal funding. As a public institution, we have a responsibility to each taxpayer, and our excellence is the best way to step up to that responsibility. New challenges await us, and the school must enhance its positive role in social change brought about by technology.

Celebrating our school’s 50th anniversary also means celebrating its alumni, because you carry within you EPFL’s DNA. Nothing will break that tie. You are its best ambassadors and spokespeople. The quality of your careers and diversity of your experiences contribute to the very image of EPFL throughout the world. Amid all the celebration, a special day will be set aside just for you. It is essential for us to join one another in celebrating our past successes and building the future together. To achieve its full potential, EPFL needs you, its alumni. You are its life force. Your participation in the school’s key projects, by dedicating your expertise, time or investment, is crucial to making them a reality.

I look forward to seeing you very soon on your campus and would like to take this opportunity to wish you a happy and healthy 2019.
1969–2019: EPFL’s stellar trajectory

Originally set up under a private initiative in 1853, the École Polytechnique de l’Université de Lausanne (EPUL) became a federal institute of technology in 1969.

When Maurice Cosandey took over as head of what was then the École Polytechnique de l’Université de Lausanne (EPUL) on 1 April 1963, he had a firm goal: “To turn our cantonal engineering school into a federal institute.” And that goal was reached six years later when EPUL became EPFL, the École Polytechnique Fédérale de Lausanne – Switzerland’s second federal institute of technology after ETH Zurich. EPFL will be officially celebrating its 50th anniversary in 2019, but our history began a century before that.

A HISTORIC MOMENT
In 1968, both houses of Switzerland’s parliament voted unanimously to create a second federal institute of technology. That same year, the Vaud parliament unanimously approved the transfer of the school to the federal level. “The main thing we feel at that historic moment is pride. Even though EPFL – its new name – will no longer be a Vaud cantonal school, it will remain based in Lausanne. And looking at ETH Zurich, it’s clear that the school has been a key driver of the city’s development. I’d be surprised if the same didn’t hold true for Lausanne,” wrote the Gazette de Lausanne on May 8th 1968. EPFL was officially created on January 1st 1969. The school’s federal status paved the way to an expansion programme, new buildings and the relocation to Écublens. Each EPFL president left his mark along the way. And the school grew to encompass more than just engineering. After having already added architecture in 1946, it eventually tackled computer science, microengineering, communication systems, life sciences and two colleges. The school has also spread its roots in French-speaking Switzerland with new sites in Geneva, Fribourg, Neuchâtel and Valais.

Digging through the archives, you can’t help but notice that many of the key issues the school faces are still the same: encouraging women in technical fields, engineers’ social responsibility with regard to new technology, ethics, how the school is positioned relative to ETH Zurich, relations with the industry, public- and private-sector financing, cooperation, fundamental research, the role of science and engineering in our society, supporting our region’s social and economic development...

The more things change, the more they stay the same. And one thing has held constant throughout the school’s five different names and 16 different presidents: a drive for excellence and to expand its reach beyond its local borders.
Schedule: Alumni 50th and other events

The Alumni 50th celebration will be held on November 9th 2019. Don’t miss this day entirely devoted to you for EPFL’s 50th anniversary. Other important events will mark out this year of celebration, starting with the EPFL Open House in September.

A whole day to see your friends again, re-experience your favourite amphitheatres, find out what’s new on campus, attend exciting talks featuring renowned speakers, and celebrate in style at the gala. Sounds like a dream? EPFL Alumni is making it happen so that you can join together in celebration of your school and those who have contributed to its top-notch reputation: you, its alumni. All information and a detailed schedule will be available shortly.

### Schedule

17.05 | **EDUCATION DAY**
Find out more about major developments in teaching, new educational solutions and innovative learning processes (MOOCs, etc.). This event addresses educators throughout Switzerland.

10-14.09 | **DAYS OF RESEARCH**
The event aims to bring together key political, academic and industrial partners of the surrounding area of each EPFL site around a key research subject of the site. The objective is to show the benefits that, with political support and industry collaboration, research has for the local community.

18.10 | **OPEN SCIENCE DAY**
EPFL invites a group of world-class researchers and policy-makers and asks them to share their expert opinion on how to best deal with the current transition to open science, and what scientific research may look like in the future.

19.11 | **INDUSTRY DAY**
Business leaders will discuss how innovation happens in their respective organisations, industries and markets. They will also discuss the collaboration and relations they maintain with EPFL, and how the school helps them innovate.

20.11 | **INVESTOR DAY**
Investor Day brings together a selection of investors to learn more about EPFL’s startups, that will each pitch their innovative ideas. Ranging across all sectors (medtech, energy, drones…), 100 to 120 startups will be featured.

Further information on celebration.epfl.ch.

For International Women’s Day, EPFL Alumni celebrates 50 years of the school’s women graduates. A panel of alumnae representing every decade in EPFL’s history, who play a key role in business, entrepreneurship and research, will discuss the challenges and issues they have faced over their careers.

Uncover the secrets of EPFL laboratories, visit its new infrastructure and show your campus to your loved ones over this exceptional weekend. The two-day programme will feature the 2019 editions of two major on-campus events, Drone Days and Scientastic. Eminent guests will also be there, including Frédéric Courant, “Fred” from the television show *C’est pas Sorcier*, and Aleksi Briclot, illustrator from Marvel comics, invited in partnership with La Maison d’Ailleurs.

Further information on celebration.epfl.ch.
Alumni advise students in preparing for Forum EPFL

With more than 170 companies and 70 startups, Forum EPFL is one of the biggest recruitment fairs in Europe. That makes it a key event for those just starting out on their professional career. EPFL graduates now act as mentors to help them prepare for it.

What career and what industry should I choose? Should I do a PhD? What would an experience abroad bring me? These questions, and countless others, are asked by a large number of EPFL students. The experience of alumni with careers in full swing can be of immense value in answering them. Knowledge sharing helps students better understand the industry they have chosen and gain more accurate insight into what companies expect from candidates. EPFL Alumni and Forum EPFL decided to harness that potential by creating a new mentoring programme in 2018, which ran from May to the beginning of the fair in October. The aim of the programme was to strengthen the culture of helping others within the school and give alumni the opportunity to contribute directly to students’ success.

SPRINGBOARD INTO THE JOB MARKET
In addition to mentorship, the programme provided occasions for bringing the EPFL community together. Students met their mentor for the first time at the launch party in May for example. And the closing event in early November at the Montreux Jazz Café was a time to celebrate and share experiences shortly after the end of the Forum. A total of 177 alumnus-student relationships were set up, which brought precious advice and, in many cases, landed a trainee programme or first job.

Nearly 75% of the mentors lived in Switzerland, but the programme did not stop at the country’s borders. Several mentors were based in other European countries, as well as Asia and even Oceania. Business sectors ranged from finance research to computer science, architecture and civil engineering, thereby responding to the various needs of students, who came from all EPFL sections. Many leading companies were represented, including Nestlé, Facebook, Swisscom, McKinsey, and many more.

Eighty-five percent of the students in the programme were working towards their master's degree. The programme was popular with female students, as 36% of mentees were women. That percentage is higher than the proportion of women out of the total number of students. As a volunteer-based programme, participants could manage how often they contacted each other. In all, 584 hours of mentoring took place, which comes out to 24 days! The survey conducted following Forum EPFL showed that alumni and students alike were satisfied with the programme, and 90% would recommend it. This first edition will certainly lead to more. See you in 2019!

Sectors and sections

**ALUMNI**
- R&D: 21%
- Management: 17%
- Supply Chain: 12%
- Consulting: 10%
- Entrepreneurship: 9%

**STUDENTS**
- School of Engineering: 35%
- Computer and Communication Sciences: 21%
- Basic Sciences: 18%
- Architecture, Civil and Environmental Engineering: 13%
- Life Sciences: 7%
- Management of Technology: 5%
- EPFL Middle East: 1%

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Your Innovation Journey at the SwissTech Convention Center

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Discover your personality type with the MBTI assessment

EPFL Alumni regularly offers graduates to take the MBTI (Myers-Briggs Type Indicator) assessment. The MBTI is used to better understand how people prefer to operate and relate to others, especially in the working world. EPFL graduate Yvan Galeuchet (PH’87, PhD PH’91) and certified MBTI practitioner joins us to present and explain the tool.

What is the MBTI assessment?

Yvan Galeuchet – We all have natural preferences in the way we process information, make decisions, organise our life and focus our energy. The MBTI assessment provides a way of identifying these preferences and exploring your personality profile through 16 existing types.

This psychometric tool was developed in the 1940s by two researchers in psychology, Katharine Cook Briggs and her daughter Isabel Briggs Myers, based on the theory of psychological types developed by Carl Gustav Jung, the father of analytical psychology. With 3 million people taking the MBTI assessment every year, it is the most commonly used psychometric test in the world.

What is your approach in the workshops you give for EPFL graduates?

YG – Before the workshop, participants are asked to complete the MBTI questionnaire on the official website of the Myers-Briggs Company. Then, I send them, by email, the results that highlight the profile they seem to fit, with some additional clarification if necessary. The main objective of the workshop is for each participant to leave having clearly identified and validated his profile. Following the online test, some preferences may indeed remain unclear. Other tools used during the workshop can help determine them more clearly, such as the detailed description of preferences or the Action Types approach, which is based on each individual’s motor skills and in which the body indicates what our MBTI preferences are. The second objective is to explore the MBTI’s 16 personality types in depth, to learn how to identify them and better adapt to the person you are interacting with.

How can the MBTI assessment be useful for your career?

YG – Developing a better understanding of our own operating mode and becoming aware of how others prefer to operate can help create smoother relationships within an organisation. Moreover, your personality profile suggests the type of profession or activity that would best align with your preferences, at the beginning of a career or during a professional transition. However, it is crucial to remember that your preferences and your skills are two different things. You can still excel in a job, even if it does not match your personality profile. It just takes more effort to adapt.

Biography

Yvan Galeuchet earned his Master’s degree at EPFL in Physics in 1987 and his PhD in 1991. After starting out in research, he shifted towards management consulting at McKinsey & Co. before joining the Pictet bank. There, he held positions such as chief financial officer of the Wealth Management Division and senior vice president learning & development. He has also been a certified MBTI practitioner since 2003. Yvan Galeuchet is currently self-employed and has founded his own personal and professional development consulting firm.

Your next career workshops

January 24th
Boost your career with LinkedIn and social media, with Philippe Pache.

February 5th (Zurich) and February 6th (Lausanne)
Explore your personality type with the MBTI assessment, with Yvan Galeuchet.

March 9th
Career management and job research, with Daniel Porot.

April 4th
Managing your career after 40, with Daniel Porot.

May 16th
Explore your personality type with the MBTI assessment, with Yvan Galeuchet.
Swissquote is not like other banks. The online financial services company has been posting outstanding results since 1997. Driven by EPFL alumni Marc Bürki and Paolo Buzzi, Swissquote has always relied on innovation to stay on top.

On Thursdays, it’s Swissquote’s turn to treat everyone to afternoon snacks! Pastries in hand, employees wander through the sleekly designed offices of Switzerland’s leading online bank. The dress code is casual, with staff decked out in skinny jeans and designer trainers. The atmosphere is different from the typically stiff world of Swiss finance. Even the bank’s location – near the train tracks in an industrial park in Gland in the canton of Vaud – breaks from tradition for a bank.

But the relaxed atmosphere doesn’t affect productivity. With revenue of CHF 187.5 million in 2017, i.e. 25% growth on 2016, its performance is actually outstanding. Fuelling that success are Swissquote’s shareholders and founders, Marc Bürki and Paolo Buzzi, who have been working together for nearly 30 years. Partners in business and friends outside work, the duo has preserved its entrepreneurial flair by keeping their minds on constant alert. Their answers in the interview are smooth, suggesting they’ve been through the process before. But something about their remarks reveals a touch of fantasy, unexpected for people who look like regular bankers.

Interview with these EPFL alumni, who have remained engineers at heart and dedicated themselves to innovation to bring banking services to all.

In 2017, Swissquote had 309,286 customer accounts (up 2.2% on 2016). In a record year, the company’s revenue increased 25% to CHF 187.5 million (CHF 150 million in 2016). For 2018, the bank aims for 10% growth in revenue and net profit.
Timeline

1988
At a party at EPFL, Paolo Buzzi tried – unsuccessfully – to charm Marc Bürgi’s girlfriend. That was the beginning of a friendship and professional relationship that has lasted 30 years.

1990
Launch of Marvel Communications, specialised in financial information software.

1994
Creation of websites. Redesign of the International Olympic Committee’s web portal.

1997
Launch of the financial platform Swissquote.ch.

1998
Creation of Swissquote Trade SA, the brokerage division.

2000
Swissquote Group Holding SA was listed on the Swiss stock exchange. The company obtained a banking licence.

2001
First online-only bank in Switzerland. Access to the US stock exchanges NYSE, NASDAQ and AMEX.

Swissquote is Switzerland’s leading online bank. How would you define your business philosophy?

Marc Bürgi: Curiosity, creativity, intuition and technological inventiveness. Innovation has been in our DNA since Swissquote opened in 1997. With our digital banking solutions and software, we make finance more understandable and accessible to all our customers.

Paolo Buzzi: We also make it more transparent and more flexible. That’s what responsible investors want today. The ultimate achievement is to become the world’s most pioneering and intuitive online bank. We’re working hard to get there!

Flashback – how did the concept for Swissquote come about?

MB The digitisation of stock exchanges in 1994 gave bankers access to information in real time, which had until then remained unavailable to the general public. Our idea was to democratise that data, and make it visible for everyone to see, for free.

PB The idea of opening the tightly-locked door to the stock exchange didn’t sit well with everyone. What saved us was the immediate success of our website. Demand was so high that the platform exploded. Our rapid ascension caught the attention of the media. Our reputation exploded. Our rapid ascension caught the attention of the media. Our reputation is what protected us. With our website, our customers could track stock prices in real time. All bankers had left to do was place orders.

For the next logical steps, Swissquote became a bank and went public in 2000.

PB Stock exchanges charged us high fees for access to their information. We never could have reached financial balance with advertising income alone. We had to find other innovative tools to meet our customers’ expectations while trying to be profitable. We sensed the potential of the internet and our ideas to develop online trading. The enthusiasm of our customers, those small private share-holders so present in Switzerland, was palpable. Even modest portfolio holders wanted to understand the online trading universe and have easy access to it. Our services brought them that.

MB For us to achieve balance and hope to be profitable, we had to charge for our real-time information service. We also added new services, letting customers place stock market orders themselves on our Swissquote Trade platform launched in 1998. As only banks are authorised to carry out these trades, we teamed up with the Zurich-based private bank Rüd Blass. With trading, we could be paid a small fee for each order, which was always much lower than the fees charged by banks.

PB This partnership worked well and allowed us to develop the way we’d hoped. But Swissquote had to become a bank. We applied for a licence with the Swiss Federal Banking Commission. I remember files full of explanations to study. And one key requirement: we needed capitalisation of CHF 20 million to obtain a licence. Swissquote launched an IPO to raise that money. Going public meant that the company had to justify its strategic decisions to its investors. That wasn’t easy for people like us, who are used to just charging forward. However, we met lots of new partners when we floated the company.

The Swissquote adventure owes a lot to Marvel Communications, your first financial information software company. Why did you get into that business in 1990?

MB Banks use a lot of software. They needed software to be connected to real-time stock prices and information feeds. We created that specific tool to present it to different investors who might be willing to support our project. That’s when we met Jean Pfau, the former boss of Charmilles Technologies.

PB A passionate physicist, he didn’t just invest in our company, he became our business angel. His advice and support taught us the ins and outs of entrepreneurship. I remember a discussion we once had driving between Zurich and Lausanne. Jean asked us to sum up our strategy in one sentence. We were caught off guard by the question and incapable of answering. We got a good roasting for that. That episode has since served as a lesson. Companies that succeed are those that can sum up their strategy in a few words.

You were also a pioneer in creating websites.

PB In the early 1990s, after selling our financial information downloading software throughout Europe, the segment was swallowed up by internet service providers. They could easily do without our service once the stock exchange went digital in 1994. That’s when our financial reserves were wiped out. We had to reinvent ourselves and do something new.

MB The world wide web was just emerging, but we knew the internet would play a crucial role in all areas. We went to Internet World in Boston in 1996, and it was like an electric shock to push us in a new direction. The big names, like Amazon, Yahoo and others, were there to present the possibilities of the Net. That infinite universe fascinated us, and we started creating websites.

With your usual success. Your customers included some leaders in the Swiss economy.

MB Yes, Peugeot Switzerland, Nespresso and others put their trust in us. The business world could tell that the internet was going to be the way of the future.
But the pivotal moment came when we met Franklin Servan-Schreiber, communications director for the International Olympic Committee (IOC). He contacted us by email one evening at 10 p.m. At the time, we were working day and night, and we answered him right away, suggesting we meet the next day. He too is an engineer. We hit it off, and he brought us on board to redesign the IOC’s websites.

PB In the middle of the 1990s, after several scandals, the organisation needed to enhance its image. With its planetary aura, the internet seemed like the ideal network for boosting the committee’s communication. For us, it was a huge, exciting challenge. Landing that $3.5 million contract helped us bounce back. Meanwhile, the Swissquote adventure was still in the works. Our objective remained to launch an online brokerage service.

Swissquote’s growth has been almost constant. How would you explain that success?

MB We have posted growth every year since 2003. Rising 25% compared with 2016, 2017 revenue was almost CHF 188 million, with profits of CHF 39.2 million. For 2018, we aim for growth of 10%.

But beyond those figures, we owe our success to a number of chance encounters, which each, in its own way, played an important role in our development. We’ve often met someone, talked about a project and said, “Ok, let’s do it!”. Working with existing banks, establishing strong partnerships and bringing in a skilled team are also some of the keys to the success of our company.

PB Since it was founded, our platform has continuously been enhanced. We’re in a business that is constantly revolutionised and brought to an ever wider public. As engineers, we automate and digitise everything we possibly can to minimise costs. Keen intuition, creativity and constant innovation to provide services at very competitive prices are the secret to our success. We also listen carefully to our customers to remain attentive to the needs of this new generation of hyper-connected consumers. Online banks are the norm for them.

This success has led you to develop outside Switzerland and acquire other companies.

MB Switzerland is a small country, so we have to develop abroad. Today, we have offices in Malta, London, Dubai and Hong Kong. These entities give us access to the world’s main markets, while diversifying our business and broadening our customer base. The acquisition of other companies, such as Advanced Currency Market (ACM) in 2010 and MIG Bank in 2013, expanded our range of services, especially in forex trading. More recently, partnerships with Swiss banks have opened doors to the derivatives and mortgage markets.

“Companies that succeed are those that can sum up their strategy in a few words”

Paolo Buzzi

• Born in Tunisia in 1961. Settled in the canton of Vaud.
• His family was originally from German-speaking Switzerland. Markus – his real name – spent his childhood and teenage years in Tunisia and Morocco before returning to Switzerland to study.
• Electrical engineering degree from EPFL in 1987.
• Member of the Council of Switzerland’s polytechnical schools since 2017.
• With a passion for aviation, he holds a pilot’s licence.

Marc Bü尔ki

• Born in Basel in 1961 to a family from Ticino. Settled in the canton of Vaud.
• Paolo spent his childhood in French-speaking Switzerland.
• Microtechnology engineering degree from EPFL in 1988.
• Member of EPFL’s Strategy Council.
• With a passion for aviation, he holds a pilot’s licence obtained with Marc in Missouri, in the US.
In parallel with this geographical development, we continually test new, more efficient tools and new services. Staying on the cutting edge of technology is our trademark. It sets us apart from our competitors and gives us a lead over them.

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So, what are your latest innovations and how do you see the future of fintech?

MB We’re already in the future of fintech. Since July 2017, our customers have been able to invest in cryptocurrencies and use their trading account to trade against euros or dollars. They not only have access to Bitcoin but also Bitcoin Cash, Ether, Litecoin and Ripple, the top five virtual currencies on the market. We also recently launched a multi-currency credit card to let globetrotters pay in 12 currencies without fees. At the end of October, we began offering digital tokens issued by the startup LakeDiamond, a high-tech diamond producer. With these tokens, investors buy units of the company’s machine operating time.

Have you experienced any periods of struggle in your success story?

PB Of course. But we learnt valuable lessons. Before the financial crash of 2008, our company hit a growth crisis at the very beginning of the 2000s. High on our success, we grew too fast and our revenue didn’t follow. We restructured in 2001, reducing our staff from 180 to 80 people. Today we employ over 600 people.

You're both EPFL engineers. What qualities and values did you gain through your studies?

PB It took us a long time to get accepted quite where to put us, we sit in the middle. A bit of both! In meetings, cantonal banks sit on one side of the table and private banks on the other. As nobody knows quite where to put us, we sit in the middle.

MB It took us a long time to get accepted in the banking world. Now it’s the opposite! With digitisation and the privileged position of engineers in finance, bankers frequently come to us for advice.

Over all these years, your friendship seems intact. Working together hasn’t changed your relationship?

PB No, quite the opposite! Marc has become a brother to me. We love sharing our thoughts, putting new projects together and facing new challenges. Basically, we still dream about changing the world.

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What ties have you kept with EPFL?

MB We’ve remained very close to the school. Some areas of research that EPFL laboratories are involved in are very important for our development. Moreover, our experience and the behaviour of our customers are interesting research topics for EPFL students.

Who are Marc Bürki and Paolo Buzzi today? Engineers or bankers?

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What advice would you give to recent EPFL graduates today?

MB Intuition and innovation are vital in finance. To be innovative, you have to stay modest. You have to be able to listen to young people coming in, use their ideas to capture tomorrow’s trends and always stay a step ahead.

PB You have to dare entrepreneurship. When you’re young, it’s worth taking the risk to set up a company. Through innovation and bringing a fresh viewpoint, we create value and stand out from the rest. EPFL gives us good grounding to do that.

EPFL alumni share their advice and experiences at Swissquote.

Marc Bürki (left) and Paolo Buzzi met as students at EPFL. The two engineers have been working together since 1990 and founded Swissquote in 1997.

Alumni at Swissquote

By Tiago Pires

Cécile Grometto (IN’12)
Software Architect

“I’m of Japanese descent, and the internet enables me to stay in contact with my family. This relationship is so important to me that I wanted to understand how this network, and more generally computer science, operates. So I enrolled in EPFL’s Computer Science programme in 2006.

Most importantly, the school taught us how to learn, to understand what we’re doing and why we do it. That ability can then be applied to all areas, even those that are not directly related to our initial education. For example, I knew nothing about finance before working at Swissquote.

But I find that notion of understanding and analysis working with the Financial Data team in Product Development. We analyse the technical aspects of projects and provide libraries of software needed by other teams. Day to day, we have the freedom to think about everything we do and contribute to any current projects.

The family spirit at Swissquote can be felt every day, both in how we help each other and at events organised by the company. For example, every September, management presents how the company is doing and invites all employees to a meal.”

Raphaël Marthe (MT’02)
Head Securities Trading Platform

“Swissquote is where I grew up! I didn’t have much experience in the working world before joining the company. It gives me the opportunity to learn and improve. I work at a bank that’s different from others in many ways. There is no dress code here. Everyone is casual and in an open workspace. This policy brings employees together and makes managers more accessible.

The open-minded approach is also reflected in the way we work. To manage the upgrade maintenance of trading platforms, we have to find elegant software solutions to optimise our services for our customers. If an employee has an idea or wants to develop solutions, Swissquote leaves him or her some scope to take action.

This freedom pushes us to excel. A bit like during my microengineering studies at EPFL: professors instilled in us the drive to learn by continuously challenging us.”

Marius Konwicki (IN’03)
Trading Platforms Manager

“I’d always wondered how a long set of 1s and 0s could generate all the complex applications we have today. To understand that, I enrolled in EPFL’s Computer Science programme in 1998. The school taught me how to approach complex problems in order to solve them.

When I joined Swissquote in 2008, I discovered the freedom of creating. I like the sort of startup feel at the company. We have to solve complex problems by applying our logic, business knowledge and technical expertise. Far from the ways of a traditional bank, Swissquote fosters a friendly, family spirit. Staff members address each other informally. These values help us work in a relaxed atmosphere typical of fintech firms. Lots of meeting spaces are available for employees, like the pub at our cafeteria, which is open every day and even in the evening, the terrace with a barbecue, and a fitness room just a few hundred metres away.”
Pauline Baumgartner-Harris and Déborah Heintze win the 2018 Alumni Awards

Every year, EPFL’s graduation ceremony provides the opportunity to honour former students who have led inspiring careers. The 2018 Alumni Awards recognised two alumnae, Pauline Baumgartner-Harris (CH’97) and Déborah Heintze (SV’12), as outstanding leaders in industry and entrepreneurship. What they share is passion and uncompromising standards.

PAULINE BAUMGARTNER-HARRIS
CH’97

On receiving her Alumni Award at the 2018 graduation ceremony, Pauline Baumgartner-Harris expressed how proud she was to be honoured by a school that has always managed to reinvent itself. This ability to adapt is precisely what has marked her own career, as she obtained her European Patent Attorney qualification in 2002, just five years after her engineering degree at EPFL. After earning this second title, her profile at the intersection between chemistry and law was a perfect match for Firmenich, where she had been working since 1998.

Her natural curiosity led her to expand the focus of her work and she joined the business development team of the flavours division, in a position combining marketing, sales and innovation. That experience gave her a better understanding of business objectives. When she decided to return to intellectual property in 2008, she went to work for Nestlé at its headquarters in Vevey, in the very competitive environment of ice cream.

In 2013, Firmenich, whose legal department joined the group responsible for patents, thought of her to support its fragrance division. Her expertise and business insight served her well in an environment increasingly based on open innovation, building on partnerships with academic institutions, including EPFL, and client companies. This successful experience led Firmenich to offer her a key position as vice president head of intellectual property in 2016. In this role, Pauline Baumgartner-Harris has implemented her strategic vision while aiming to promote innovation through intellectual property.

Before the school’s 1,043 new graduates at the 2018 graduation ceremony (see p.8), she stressed the importance of the education they had just completed. “With this degree, you hold something of great value. It can open doors for you to an incredible number of professional opportunities,” she said. Proud of her education, as was her father, who also graduated from EPFL, she concluded with smile, “I hope one day my children will be lucky enough to be where you are sitting today.”
“Entrepreneurship is a constant source of challenges,” Déborah Heintze said at the 2018 graduation ceremony. And, as the co-founder and chief operations officer of Lunaphore, she knows what she’s talking about. Her many responsibilities include regulations, operations, marketing, business development and managing a team of 25 people.

When she graduated from EPFL in 2012, after a year at Harvard-MIT Health Sciences and Technology Institute, Déborah Heintze had two options for beginning her career. The first was for a comfortable, well-paid position with a large international biomedical firm and the second was to co-found a startup with no long-term guarantees. She chose the option offering less security but that was more in line with what she wanted to do. Hence the Lunaphore adventure began.

What is Lunaphore about? Nothing less than a medical revolution. Its new microfluidic technology reduces the time needed to diagnose cancerous tissue from hours to minutes. The technique could impact both routine checks and checks performed during surgery, meaning that surgical procedures would not have to be interrupted while waiting for a diagnosis and therefore meaning fewer procedures overall.

Its technology has put Lunaphore in the industry spotlight, especially with its recent fundraising round when it secured CHF 5.3 million. Awards came rolling in during 2018 both for the company, which ranked third among the Top 100 best Swiss startups, and for Déborah Heintze, who had the honour of being selected for the Forbes 30 Under 30 list for Switzerland. She may be standing centre stage now, but Déborah Heintze emphasises the importance of teamwork in the development of Lunaphore and highlights the vital roles played by the company’s other two co-founders – Ata Tuna Ciftlik (PhD MT’13) and Diego Gabriel Dupouy (PhD MT’16) – and the 25 company employees, a steadily growing team.

Although a number of steps remain, the first of which is the market launch of Lunaphore’s first devices in 2019, the path taken by Déborah Heintze, just six years after obtaining her engineering degree from EPFL, is already a source of inspiration for all alumni. And that offers proof that decisions are made not only with the head but also with the heart.
Docteur Gab’s: success on draught

In 2001, long before today’s microbrewery craze, Reto Engler (SIE’09) and his co-founders created Docteur Gab’s. After starting out in their parents’ kitchen, the beverage has gone on to become a staple on tables throughout French-speaking Switzerland and is now the banner brand for craft beer in the Vaud region. Here is a look back at how the adventure started.

The offbeat logo – the stemmed beer glass-shaped, winking face of a doctor sporting a mirror reflector – is now well-known throughout French-speaking Switzerland. From EPFL’s student bar, Satellite, to the most popular bars in Lausanne, Geneva and Neuchâtel, Docteur Gab’s beers and their funny, authentic style have become omnipresent in the region. This astounding rise among the region’s brews was built on the friendship between Reto Engler, an EPFL graduate who earned his degree in Environmental Sciences and Engineering (SIE) in 2009, and his two co-founders, David Paraskevopoulos and Gabriel Hasler.

GARAGE BREWERY
In 2001, the three secondary-school friends shared not only their love for beer, but also a strong penchant for entrepreneurship and experimentation. “From developing the range, production, and marketing strategy, to bottling and delivery, etc., we were doing absolutely everything ourselves,” Reto Engler reminisces.

The first beers were brewed in the kitchen of one of the boys’ parents, who were bewildered but supportive about the undertaking. Following the model of successful Silicon Valley startups, the adventure moved into the garage in 2002. Reto Engler’s parents’ garage was where the first vats were kept, and where the trio toiled evenings and weekends. Then the first customers began pouring in. To meet demand, production increased, and the premises, now too small, grew. The brewers moved again in 2004, this time setting up in Epalinges.

“This move brought new obligations. We now had a rent to pay and debt taken out to buy brewing equipment, meaning real obligations in terms of business performance.” Unusual obligations for young adults just starting university.

The brand’s identity is built on authenticity, and that is reflected in its production methods. By prioritising local products, for example bottles from the St Prex glass manufacturer, Docteur Gab’s demonstrates that it is firmly grounded in its roots. “We also try to be as responsible as possible in our production processes. We send our production waste to a local farmer who uses it for methanation. He produces the electricity that we then use at the factory.”

Moreover, SIE students from EPFL come every year to visit the factory as part of their industrial ecology courses.

The company currently generates annual revenue of nearly CHF 10 million, and its strategy focuses on diversification. Its first step was to develop a lager, Swaf. Lighter than the brand’s trademark brews, Swaf is made to compete with market giants, the likes of Heineken and Carlsberg. The next step is to move into new products, such as cider, also made in the local spirit using apples from the region. The company has also begun selling its products in supermarkets and is using its strong foothold in French-speaking Switzerland as a springboard to tackle the country’s German-speaking market.

But, above all, Docteur Gab’s remains faithful to its identity and initial philosophy of nurturing its close relationship with the brand’s fans. “The first Docteur Gab’s bar has recently opened on Rue de Bourg in Lausanne,” Reto Engler says. That way, people can have a good time and explore this incredible success story of French-speaking Switzerland.

PROMISING NICHE
Reto Engler took advantage of his time at EPFL to have his classmates taste his creations. Docteur Gab’s became a must at class dinners and moved into the campus bar, Satellite. “It was one of the first bars to sell our beers. It’s still available on draught there today, and we regularly hold tastings.”

When they graduated in 2010, Reto Engler and the other Docteur Gab’s co-founders gave themselves a year to test the viability of their business. They continued to develop the range of authentic, unique beers. It turned out to be the right strategic decision in a market currently dominated by giants, but in which microbreweries are experiencing the strongest growth.

The three co-founders took a coaching programme and secured their first financing from private investors, which allowed them to structure the company and come up with a medium-term business plan. Showing just how much potential their entrepreneurial venture had, in 2012 Docteur Gab’s won the PERL Jury’s Award, which is generally handed to technology startups.

LOCAL, RESPONSIBLE PRODUCTION
Roles formed naturally among the team members. Reto Engler applies his education in engineering as head of the company and come up with a medium-term business plan. Showing just how much potential their entrepreneurial venture had, in 2012 Docteur Gab’s won the PERL Jury’s Award, which is generally handed to technology startups.

The company currently generates annual revenue of nearly CHF 10 million, and its strategy focuses on diversification. Its first step was to develop a lager, Swaf. Lighter than the brand’s trademark brews, Swaf is made to compete with market giants, the likes of Heineken and Carlsberg. The next step is to move into new products, such as cider, also made in the local spirit using apples from the region. The company has also begun selling its products in supermarkets and is using its strong foothold in French-speaking Switzerland as a springboard to tackle the country’s German-speaking market.

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By using local products, Docteur Gab’s shows that it is firmly grounded in its roots and is a responsible business.
Still primarily driven by empirical findings, machine learning is rewriting society’s game rules. Advances are mind-boggling, infiltrating every area of human activity.

W here’s Wally? Many children are familiar with the character in the red and white striped shirt. They try to spot him as fast as they can in the middle of illustrations featuring busy scenes and colourful crowds. However well humans may score, chances are There’s Waldo, the robot designed by the American creative agency Redpepper, will outdo them. In 4.45 seconds, the computer – equipped with a camera, robotic arm and solid training in image recognition – can find Wally.

Far more than an anecdote, this example reminds us that the most famous machine learning applications are in gaming. However, since IBM’s supercomputer Deep Blue defeated Garry Kasparov at chess in 1997, the potential uses for this technology have evolved significantly. Online, Facebook teaches its algorithms how to identify false information to reduce the number of people exposed to fake news. In California, oceanographers from Scripps Institution of Oceanography use machine learning to analyse some 52 million echolocation clicks made by whales and dolphins, allowing scientists to better track their movement through the oceans. In every area, computer systems are accomplishing tasks that seemed far-fetched not long ago.

M O V I N G C L O S E R T O H U M A N I N T E L L I G E N C E

Machine learning and artificial intelligence. These two terms are often used indifferently, and the lines between them blurred. “One is the means, the other is the consequence,” says Marcel Salathé, professor at the Digital Epidemiology Lab and creator of the EPFL Extension School. “Machine learning is the process that develops artificial intelligence.” In more concrete terms, it involves designing programmes that allow a system to learn how to perform tasks such as identifying, classifying, and predicting movement and other factors, without human intervention.
Machine learning techniques fall into three main categories. First, reinforcement learning. Over time, the machine learns to detect the good decisions and repeat them. The second is supervised learning. This technique uses human intervention to teach a software programme to tell a cat from a dog or a fork by feeding it millions of images of cats, and labelling them as cats. Finally the third and most complex technique – unsupervised learning – goes a step further. The system is not told what type of images are provided. This type of learning is closest to living intelligence dealing with a world whose rules it gradually discovers. But machine learning is still a world away from the artificial intelligence depicted in science fiction. “Behaving intelligently in the real world is more complex than telling the difference between cats and dogs,” says Martin Jaggi, assistant professor and researcher with the Machine Learning and Optimization Laboratory at EPFL. Are we at the dawn of another technological revolution? Yes and no, Professor Martin Jaggi says. “We’re undeniably seeing impressive progress in machine learning. But there’s no reason to give into sensationalism. We’re far from understanding how and why the technology works.” This lack of understanding intrigues Marcel Salathé. “The most revolutionary thing is precisely that we don’t really know yet how it works!”

HELPING COMMUNITIES MAKE DECISIONS

Thanks to the collective expertise at EPFL, graduates are working to improve the overall performance of multinationals such as Amazon, Cisco, Google and Uber. At Swisscom, the leading telecoms operator in Switzerland, they help local authorities more effectively grasp mobility by analysing the data collected from its subscribers. Nothing could be simpler in theory, says Mohammed Kakši (PhD SC’15), a data scientist with Swisscom’s Mobility Insights team. “By monitoring the interaction between mobile phones and cell towers, we gain information on how people move about at a given time and within a given space. We understand where they’re coming from, where they’re going and by what means.” That means that the algorithm currently being tested in several cities, including Geneva and Montreux, is learning to differentiate between passengers on a train and people travelling by car.

And that is precious information for government officials. “Until now, travel was measured using questionnaires to users. But the sample is small and the studies are expensive. Swisscom’s solution enlarges the scope of the survey. We achieve more reliable and more dynamic results, at a lower cost.” In transport, this method is ideal for helping local authorities make the right decisions, for example, whether to close a street, change its direction, build a tunnel or increase the number of trains.

PICKING OUT A GRAIN OF RICE

For several years, EPFL has been sending an important message. Machine learning is not just for tech giants. “Only using it with big data is a mistake,” says Olivier Verscheure (PhD SC’99), executive director of the Swiss Data Science Center (SDSC) based in Lausanne and Zurich. He prefers the term “smart data”. “Machine learning is perfectly possible using a relatively small data set, as long as the data is accurately defined.”

“The most revolutionary thing is that we don’t really know yet how it works!”

Marcel Salathé

This is not the first time that the giant from Mountain View and the Swiss school have teamed up. More than 30 joint initiatives have been launched since 2010, including in machine learning. The MSRA simply provides a framework that is more appropriate for certain projects. “For example, we need a special agreement to cover intellectual property rights in the case of sponsored research,” Olivier Bousquet says.

The purpose of these joint initiatives is to draw on EPFL’s strengths, such as optimisation of machine learning algorithms, innovative computer architectures and computer vision. Together, EPFL and Google define the structure and objectives of each project. Research and testing can then be conducted at EPFL, Google or both. “Working with Google highlights the value of our work published at conferences and in scientific journals. That means we can develop concrete solutions capable of responding to current needs,” says James Larus, Dean of the School of Computer and Communication Sciences (IC) at EPFL. These projects can also result in the development of open software or online databases.

EPFL AND GOOGLE: A SPECIAL PARTNERSHIP

In April 2018, EPFL and Google signed a Master Sponsored Research Agreement (MSRA) to get joint projects off the ground. “Outside the United States, our largest engineering centre is in Switzerland,” says Olivier Bousquet, head of machine learning at Google Research in Zurich. “EPFL employs some of the world’s best scientists in areas that also interest us.”

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The precise shape of a car, aircraft wing, or wind turbine blade is the result of complex calculations designed to streamline air flow. Manufacturers of these structures then carry out a battery of tests that is long and costly, especially when each change requires additional testing.

That is how Pierre Baqué (PhD IN’18) came up with the idea for his project. After completing his PhD, he founded the startup Neural Concept with two friends. His intention was to “use deep learning to determine the most aerodynamic shape of an object. And to do that, we train our algorithm using several thousand existing shapes and simulations that have already been studied.” Not only can the solution run, within fractions of a second, tests that would have taken a whole day in a wind tunnel, but it is also more effective with designs that are 5% to 20% more aerodynamic. After testing his algorithm on the body of an aerodynamic bike, Neural Concept works with the automotive and aviation industry to validate the industrial applications of his concept. In the meantime, the startup continues to advance fundamental research with EPFL laboratories.

Neural Concept
Deep learning and fluid dynamics

The success of Drone Days held at EPFL in August 2018 was evidence. Switzerland is a haven for drones, with some 3,000 jobs created within the space of a few years at 80 companies, including Picterra. Co-founded in 2016 by an EPFL graduate, Frank de Morsier (PhD EL’14), who is now its CTO, the young company based at the Innovation Park currently employs six people.

Its goal is to use artificial intelligence to analyse and interpret aerial images. Aiming to serve both private and professional customers, Picterra can either use satellite images, such as those from the European Space Agency’s programme, Sentinel, or analyse user-sourced photos, typically taken by drones. The solution uses a set of dedicated tools called Smart Focus, designed by Frank de Morsier. After learning how to recognise objects that it is asked to identify (buildings, vegetation...), Smart Focus follows them in time and space. “Similar platforms exist, but Picterra is the only one that lets users build their own solution and expand on it,” Frank de Morsier says. Users create their own shape detectors and apply them to their photographs. This knowledge gradually enhances Smart Focus and makes it more efficient.”

The applications are infinite, spanning areas including agriculture, defence, road traffic, logistics and land use. After rallying an initial group of investors, Picterra plans a second funding round in 2019 to support its growth.

Picterra
Artificial intelligence in aerial and satellite imaging

L2F, a spin-off from EPFL’s mathematics department, has clear goals in machine learning, and more specifically predictive analysis. “We want to make machine learning models, most of which remain empirically driven, stronger and more robust. By using algebraic topology to reinforce predictive analysis, we can improve learning processes and create more efficient tools that can lead to better decision-making,” say the startup’s CTO Martin Nicoletti (Ba PH’15) and Chief Scientist Maxime Gabella (PH’07).

The technology can be applied to a vast number of sectors, including finance, banking, insurance, logistics and energy consumption. Launched in 2017, L2F now has about 20 employees, a third of whom engage in fundamental research in collaboration with EPFL’s mathematics department. The rest of the team works very closely with several companies based in Switzerland and beyond. “We don’t invariably provide the same catch-all software,” Martin Nicoletti says. “Instead, we develop powerful, specialised products that are adapted to each partner’s data, needs and objectives.” This high-end consulting has attracted attention. In September 2017, L2F’s founders won hands down, out of 1,200 participants from some of the world’s largest companies, a predictive analysis and modelling competition organised by the Kaggle platform. The self-financed startup is preparing to raise CHF 5 million from local partners to continue its development.

L2F
Steering machine learning away from empirical insight

3 STARTUPS THAT APPLY MACHINE LEARNING
While EPFL works with giants such as Google, the SDSC focuses on companies that do not work directly in digital businesses. It singles out companies that are being upended by digital technology and fear missing out on the opportunity. “Ninety percent of the companies we work with operate in the traditional economy. They definitely realise that they need to learn how to manage and use the data they’ve collected but don’t know how to go about it,” Olivier Verscheure says.

With its 25 researchers from around the world, the multidisciplinary team at SDSC helps them capitalise on their business expertise and experience to successfully navigate their digital transition. “Their experience should be used to govern a machine learning process applied to their business that can optimise their operations,” Olivier Verscheure says, citing the example of the work achieved with the Swiss food processing group Bühler. The algorithm developed by the SDSC has enabled the firm’s customers to better detect unwanted items in machines that sort rice, coffee or grains. Launched in 2017, the learning process involved analysing the large amount of data collected by taking images of millions of grains. The test sample boosted the machine’s performance by 20%, while reducing the amount of waste by two-thirds. The experiment’s success has prompted Bühler to apply the process to its machines worldwide.

IDENTIFYING PEOPLE
Although machine learning is in its early stages, concrete and creative applications are already popping up in certain industries. Amazon Go, an experimental supermarket in Seattle, in the United States, has no cashiers but instead video cameras that work with computer vision algorithms to identify the items

SELF-DRIVING CARS BECOMING A REALITY IN TORONTO

In 2017, Uber opened the Advanced Technologies Group, a centre set up to make self-driving cars safer by using machine learning. It is headed by Raquel Urtasun (PhD IN’06), a professor at the University of Toronto. Interview.

How is machine learning used to develop self-driving cars?

Raquel Urtasun - A driverless car must continuously assess a multitude of parameters to detect free space, the types of vehicles surrounding it, their behaviour, and so on. By using only traditional technology, a driverless car cannot react correctly to the changes in its environment. Safety is our primary concern when it comes to self-driving cars. To teach vehicles how to understand and solve a set of problems so that they can travel about free of risk, it’s easier to use deep learning.

You joined Uber 18 months ago. What is the focus of your research?

Urtasun - The team is made up of about 15 researchers who focus on three key areas. The first is perception, or how our vehicles “see” their direct environment and identify signs, obstacles and, of course, other cars. This perception involves analysing data collected by embedded sensors: cameras, remote sensing systems using radars, GPS, etc. The second focus of their work pertains to predictive analysis. That refers to anticipating the behaviour of pedestrians, animals, lorries, cars or anyone and anything close to the vehicle. The third area is planning and control, using this information so that the car can make safe decisions about what to do next. At the same time, we work on localisation and high-definition mapping to allow vehicles to determine their position within their environment.

When will self-driving cars be a norm?

Urtasun - We have made considerable progress in a year and a half. However, we’ll have to wait a few more years before Uber has a real fleet of self-driving cars. It will take even longer before we see driverless cars everywhere. But the technology will eventually change the way we live in cities by reducing traffic jams and making travel easier.
MACHINE LEARNING DAYS

Merely in its third year, it is already a headline event. A success with 500 participants in 2017, 1,200 in 2018 and most likely twice that in January 2019, the Applied Machine Learning Days event – created by Marcel Salathé, Martin Jaggi and Robert West – shows the ever growing interest of researchers, companies and the general public in machine learning. The 2019 programme will feature four days of talks, tutorials, workshops and networking. And a big-name guest speaker is already in the line-up: Garry Kasparov, the world chess champion who lost to Deep Blue in 1997.

January 26 to 29th, SwissTech Convention Center, EPFL Innovation Park.
www.appliedmidays.org

STUDYING MACHINE LEARNING

Machine learning plays an increasingly important role in university programmes as students now learn about digital culture in the early stages of their academic career. “Most EPFL sections cover the subject as part of the undergraduate programme. With 450 students, the courses on deep learning, statistical machine learning and applied data analysis are the most popular on campus. More and more courses are opening under the Master’s programme, especially in the Data Science section,” says Martin Jaggi, assistant professor and researcher with the Machine Learning and Optimization Laboratory at EPFL. With the Extension School, EPFL has set off on an even bigger educational adventure and opens its courses to everyone, without any pre-requisite degrees or age limits. Much of the educational content now touches on machine learning.

In research, EPFL works in two directions. In the Department of Computer and Communication Sciences (IC), about 20 laboratories directly analyse machine learning processes to design better algorithms in areas such as computer vision, image recognition, textual and linguistic analysis and neural networks. Meanwhile, around 10 laboratories apply these tools to their own fields of research. “In my work on healthcare systems, machine learning helps us answer complex questions more quickly,” says Marcel Salathé, creator of the EPFL Extension School.

customers are buying. Drawing on deep learning techniques that can identify people and products, the system has got rid of employees scanning those good old bar codes. In New Mexico, also in the United States, researchers from Los Alamos National Laboratory use machine learning to predict earthquakes. But other uses have raised social and ethical concerns. By 2020, 420 million surveillance cameras built with facial recognition technology will be monitoring streets, train stations and airports in China. The authorities make no secret about their aim of creating a vast system to control its people.

Gaming is another area where machine learning has tremendous potential. “Many issues that society grapples with can be fed into a computer like a game – for example designing a city or transportation network, creating a healthcare system, responding to a disaster and managing it, and so on. These are situations where artificial intelligence could probably help us by analysing them with a fun approach,” Marcel Salathé says. The researcher suggests that fields such as medical imaging or the interpretation of legal documents are likely to undergo major changes. Imagining what we will be able to do within the next five to 10 years is certainly a dizzying thought.
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Recent tests have demonstrated the viability of the futuristic train, Hyperloop. The project is driving research and paving the way towards new forms of mobility.

1. THE PROJECT CAN WORK

Recent tests have demonstrated the viability of the futuristic train, Hyperloop. The project is driving research and paving the way towards new forms of mobility.

A number of universities are now also pitching in to develop capsules. Given this hive of activity, should we start to believe that Hyperloop could become a reality?

INCREASINGLY ADVANCED TECHNOLOGY

Founded in 2013, Hyperloop TT is brimming with some 800 experts from NASA, Boeing, Tesla and research institutes from all over the world. From this solid basis, the company licensed a technology called InducTrack based on “passive magnetic levitation”. The system works with magnets integrated into the train pods and tracks to levitate the train. For propulsion, engineers have opted for an electromagnetic system and on-board rechargeable batteries. Powered as such, Hyperloop TT trains could reach a top speed of 1,223 km/h, says the California-based company.

Meanwhile, Virgin Hyperloop One is currently focusing on developing and testing propulsion and levitation systems. Mario Paolone, full professor and chair of the Distributed Electrical Systems Laboratory at EPFL, explains that the space between the capsule carrying passengers and the tracks must first be filled. “Will it be with compressed gas cushions, magnetic levitation or just pads or wheels?” he asks. “That’s the key question, along with what propulsion system they choose. In other words, will it be based on gas expansion or electromagnetic propulsion?”

Gabriele Semino, team manager of the German WARR Hyperloop team at the Technical University of Munich (TUM), says that the latest trials using current technology are leaning towards an
Hyperloop station. Hyperloop TT’s prototype for the Abu Dhabi station could become reality within the next two years, according to the company.

electromagnetic model. “Elon Musk’s original Hyperloop design called for compressed air levitation,” he says. “But that can be difficult to do in vacuum and most importantly only provides a very small levitation gap, which is in most cases not practical for longer routes. That’s why most of today’s prototypes are moving towards an electromagnetic propulsion system and magnetic levitation.” Mario Paolone believes that a full-scale prototype, with all systems operational, could be possible before 2025.

SUCCESSFUL TESTING
In the Nevada desert, Virgin Hyperloop One has built a long tube to test the viability, resistance and speed of its revolutionary train. For now, the 8.5-metre long pod can reach a speed of 309 km/h. “We shouldn’t focus on the speed,” Mario Paolone says. “For the time being, going 1,200 km/h is technologically possible, but we need to figure out how capsules can accelerate and safely break, especially in case of contingencies, with passengers inside. A human being cannot be thrust forward, and stopped, in a tube at insane accelerations.” On top of these tests, Virgin Hyperloop One is also working on specific routes in different countries. One project is studying the feasibility of a link between Dubai and Abu Dhabi, and another envisions a connection between Mumbai and Pune, in India.

In parallel, Hyperloop TT’s futuristic train will feature 30-metre long capsules, each holding 28 to 40 passengers. The windows would be made by virtual reality companies to offer travellers interactive information or views of the landscape. The company said its system could carry 164,000 passengers a day on a single line. To test its technologies, Hyperloop TT is currently building an initial 320-metre track in Toulouse, expected to be up and running by the end of 2018. At the same time, the company will build another 1 km long test system elevated on pylons. It has also signed a deal with the Chinese group Tongren Transportation & Tourism Investment to build a 10 km long track in Tongren, in China’s Guizhou province.

To step up the development of functional prototypes and encourage student innovation, Virgin Hyperloop One has teamed up with SpaceX, Elon Musk’s space transportation company. The venture is sponsoring a series of competitions to drive university research. Since 2017, these competitions have created a buzz that is driving technological progress in Hyperloop pods. But is that enough to end up with a new, fully operational mode of transportation any time soon? That remains to be seen. ||
HYPERLOOP, TRANSPORTATION OF THE FUTURE?

2. DOUBTS PERSIST

Many questions remain that could challenge the development of the futuristic train dreamt up by Elon Musk.

Text: Robert Gloy

When the American business magnate Elon Musk first outlined the designs for his futuristic Hyperloop train in 2013, criticism rolled in within a hyper second. Since then, the main shortcomings pointed out have been safety and cost. Despite the promising results of initial tests, doubts persist as to the feasibility of the Hyperloop project. Many still wonder about its safety and even its very usefulness.

TOO MUCH THRILL?

In its final version, Hyperloop is expected to reach a top speed of 1,200 km/h. Today’s travellers are accustomed to airplane acceleration, but it lasts no more than a few seconds. “As the acceleration time in Musk’s concept would be significantly longer, the exposure to the G-forces for the passengers would be greater,” says Alfred Rufer, professor of electrical and electronic engineering at EPFL. In the 1980s and 1990s Alfred Rufer was involved in a similar project in Switzerland, Swissmetro, a magnetic levitation train that was abandoned in 2009. “If we limit acceleration to 1 metre per second squared, it would take a distance of 54 km to reach a speed of 1,200 km/h,” he explains. “Passengers would therefore experience acceleration lasting more than five minutes – and that wouldn’t be very comfortable.”

THEN THERE’S THE VACUUM

The Hyperloop concept uses magnetic levitation to thrust capsules or pods through a steel tube maintained in a near vacuum. Travelling from Los Angeles to San Francisco – the example used by Musk when he introduced the project in 2013 – would require 600 km of tubes elevated on pylons. If the tube has a diameter of at least 2 metres, the total space stripped of air would be about 2 million cubic metres. In comparison, NASA’s Space Power Facility in Ohio, the world’s largest vacuum chamber, has a volume of 30,000 cubic metres – 66 times less.

The atmospheric pressure on the tubes under vacuum would be 10 tonnes per square metre, basically the weight of a lorry. With just the slightest crack, outside air would enter the tubes at the speed of sound, and the infrastructure would implode. “The Hyperloop would be vulnerable to terrorist attacks, because it would be difficult to monitor 600 km of tubes,” says Alfred Rufer. “You’d have the same problem in the event of an earthquake. The only reasonable solution would be to go in a tunnel, where the issues of environmental impact, security and vulnerability would be solved.”

Perhaps for that reason, Elon Musk has announced that the Boring Company, his own tunnel-digging firm, plans to build a Hyperloop between New York City and Washington, D.C., underground.

HOW USEFUL WOULD IT REALLY BE?

According to Carlo van de Weijer, head of the Strategic Area Smart Mobility at the Eindhoven University of Technology (ND), the future of mobility lies in flexible systems. “The success of such companies as easyJet, Flixbus and Uber can be explained by how easily they fit into existing transportation systems,” he says. Instead of bringing greater flexibility to everyday transport, Hyperloop would require building all-new infrastructure. “We don’t need a transportation system that takes us only from point A to point B if it’s not integrated into existing infrastructure.”

Then there is the cost. Elon Musk estimated that the route from San Francisco to Los Angeles would cost $6 billion. But a study by the University of Queensland puts the price tag 10 times higher. “The Japanese magnetic levitation train SCMaglev already exceeds 600 km/h. It was considerably less costly to bring into operation than potentially building the Hyperloop,” Alfred Rufer says.

Despite these drawbacks, Alfred Rufer and Carlo van de Weijer support the research generated by the Hyperloop project. “All that buzz will lead to major advances in mobility,” says Carlo van de Weijer. “Even if Hyperloop as a serious means of transport will never happen.”
“All the buzz created by Hyperloop will lead to major advances in mobility”

The EPFLoop team at the Hyperloop Pod Competition in July 2018.

Had it not been for a technical glitch, the EPFLoop capsule could have topped the ranking. Its performance has encouraged the EPFL team to try again in 2019.

The EPFLoop project placed third in the SpaceX Hyperloop Pod Competition in July 2018. Mario Paolone, full professor with the Distributed Electrical Systems Laboratory, talks about the event.

How did EPFL get involved in the Hyperloop competition?

Mario Paolone: EPFL had already worked on developing the Swissmetro magnetic levitation train in the 1980s (see p.34). In September 2017, Denis Tudor, an electrical engineering student, suggested participating in the 2018 SpaceX Hyperloop Pod Competition to be held in Hawthorne, California. The school immediately invested in developing a pod for the high-speed train project. Since then, some 50 students, researchers and professors from different EPFL departments have worked together on designing a capsule. Their prototype was then selected for the competition.

Without a couple of technical problems, the EPFL team could have come in first.

Paolone: On the day of the competition, our capsule’s propulsion system did not reach full power. Some dust on the rails caused the pod to skid at the start. That’s why we didn’t go any faster than 85 km/h. During the trial runs the day before the competition, our capsule was pushed to 200 km/h in 300 m at half its power output. On the big day, we were hoping to hit 470 km/h in 1,200 m. In ideal conditions, we would have beat the record of 466 km/h set by the WARR team from the Technical University of Munich. At full power, EPFL’s pod could have crushed the performance of the Dutch team, which took second place at a speed of 142 km. We were terribly disappointed.

Hyperloop is still in the prototype stage. How does this type of project contribute to research and innovation?

Paolone: It brings huge potential to make valuable technological advances in the area of mobility. We don’t yet know if running capsules through tubes free of air resistance will be competitive and more energy efficient than existing means of transport. But the innovations tested for Hyperloop could be applied to other projects aiming to reduce energy use per passenger-kilometre. Whatever becomes of the Hyperloop, this type of large-scale project drives research across several disciplines and around the world.

The toughest technological challenge of Hyperloop is not to reach 1,200 km/h while transporting humans or to store enough energy for the capsule to operate on charge. No, the hardest part will be to maintain the vacuum in the tubes for several hundred kilometres at a reasonable cost.

Will you participate in the next SpaceX Hyperloop pod?

Paolone: For the EPFLoop team, being among the 18 teams selected for the competition was already an extraordinary adventure. We will repeat the experience in 2019 with quite a few changes to our capsule. But it’s a competition, so our plans are still top secret.
Improving the medical experience for millions of women

Winner of the Startup Champions Seed Night in April 2018, Aspivix develops an instrument to make gynaecological procedures safer and more comfortable. Julien Finci, a company co-founder and micro-engineering graduate from 2008, tells us more.

How did the idea for Aspivix come about?
In 2012, my brother David, who’s a gynaecologist, was telling me about the flaws of Pozzi forceps, the instrument used in more than 65 million gynaecological procedures every year. The imperfections in the instrument’s design can cause pain, lesions or bleeding. That presents an opportunity for innovation to improve the medical experience for millions of women around the world.

Aspivix is commonly used by doctors to insert an IUCD (intra uterine contraception device). The IUCD has long been recognised as an effective and inexpensive method of contraception, and does not present any health risks. Its use continues to increase and is recommended by health authorities for example in France and the United States. These are the motivations that drove business opportunity, in addition to the technological innovation.

How is Aspivix different?
Aspivix offers unequalled patient safety and comfort. Unlike Pozzi forceps, using it is painless and causes no trauma to the body thanks to its suction pad system. Made out of plastic rather than metal, it avoids the cold sensation, a significant factor contributing to the discomfort experienced by patients. Aspivix is individually wrapped in its own sterile packaging and designed for single use to guarantee protection from any infection. In 2013, we conducted a survey of about 100 healthcare professionals, who expressed their interest in an innovation of this type, thus confirming the viability of our project.

How was the team formed?
From 2008 to 2016, the year when I decided to devote myself entirely to Aspivix, I worked as an engineer and project manager in research and development at Radiometer, a company that makes and sells medical devices. That’s where I met Mathieu Horras, who was working in marketing management and business development. As we both had a feel for entrepreneurship, the opportunity represented by Aspivix drove us to take the plunge. Together with my brother David, we form a team of co-founders with extremely complementary skill sets and an excellent understanding of the healthcare industry.

What are the next steps?
We completed an initial round of financing in July 2018, raising nearly CHF 2 million. The money is going into achieving our first goal, which is to conduct a clinical study. That’s an essential step in validating the use of our prototype. Trials will be run in collaboration with Lausanne University Hospital (CHUV) and the clinical research centre. The study involves about 30 patients and is scheduled to begin in the first quarter of 2019. We plan to open a second financing round in the summer of 2019. That funding will mainly go towards supporting the market launch of Aspivix, set for late 2019, and the company’s international expansion.
2018 VENTURE AWARDS: WINNERS INCLUDE TWO STARTUPS FOUNDED BY EPFL ALUMNI

Every year >>venture<< holds one of Switzerland’s leading startup competitions, and its winners attracts serious attention from both the general public and investors. This year, two startups founded by EPFL alumni took home awards. EBA-Med (photo), co-founded and led by Adriano Garonna (PH’07, PhD PH’11), develops a non-invasive device used to treat cardiac arrhythmias using proton beam therapy. Artiria, co-founded by Guillaume Petit-Pierre (PhD MT’17), has developed a micro-robotic system that can be used to assist in stroke-related procedures. The device lets surgeons navigate through the patient’s brain arteries faster and safer. All 2018 venture winners received CHF 170,000 in prize money.

STARTUP CHAMPIONS SEED NIGHT SET TO RETURN ON APRIL 11TH

For all those innovation and entrepreneurship enthusiasts out there, the Startup Champions Seed Night is a must-not-miss event. Jointly organised by EPFL Alumni, venturelab and Innogrants, Seed Night brings together nearly 20 startups for a pitch competition before an audience of investors, mentors and the entire EPFL ecosystem, made up of researchers, students and entrepreneurs. The 2019 edition will be held on April 11th at the Forum at the Rolex Learning Center. Save the date!

EPFL STARTUPS FEATURING IN THE TOP 100

The annual Swiss Startup Award ranking is a benchmark in innovation. The 2018 edition was no exception to the rule, attracting the attention of a number of national news sources that catapulted EPFL startups into the spotlight. Bestmile and Lunaphore (see profile of Déborah Heintze, p.23) have emerged as particularly bright stars, placing second and third respectively in the ranking. A number of other EPFL spin-offs are also listed. Among the top 10 are Flyability, with its next-generation drones, and Gamaya, which develops a smart farming marketplace.

MEDICAL IMAGING FOR ALL

The GlobalDiagnostiX X-ray imaging device is ramping up for mass production. Launched in 2012 under EPFL’s EssentialTech programme (see report in Alumnist No.8) and initially designed to withstand the extreme weather conditions in southern countries, the system is also gaining appeal in industrialised nations. With the research and development phases complete, Pristem, a startup run by EPFL alumnus Bertrand Klaiber (EL’94), will handle the machine’s production and market launch. In August 2018, Pristem announced a funding round to raise CHF 14 million and unveiled the second GlobalDiagnostiX prototype in late October 2018.

AMAL THERAPEUTICS RAISES OVER CHF 33 MILLION

Founded by Madiha Derouazi (PhD CH’05), Geneva-based startup AMAL Therapeutics announced the closing of its Series B financing round in November 2018, raising in total CHF 33.2 million. AMAL Therapeutics aims to develop an effective anti-cancer therapy by simulating a patient’s immune system thanks to a unique self-adjuvanting protein-based immunization platform, capable of producing single therapeutic vaccines for immunotherapy and beyond. The funds will support clinical trial development of lead vaccine and proof-of-concept in colorectal cancer.
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Summer 2018
No 8

TECH
EPFL: the drone capital
Reinventing trust in the digital era
p.22

Quicker, stronger, more innovative
p.26

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