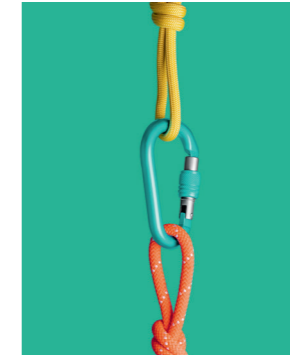


Cyber Security

Master of Science ETH/EPFL





Information is both valuable and critical. The potential for abuse is enormous and so is the need for information security. But how do we work out if a system or network is secure? Do we need to know how an attacker thinks in order to build a solid defence? Is there such a thing as perfect encryption? Will quantum computing change the game? How does logical science deal with the irrational phenomenon of trust? And how do we put all this into practice without complicating rightful use? In the field of cyber security, we are not done yet. In fact, we are likely just at the beginning.

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Compelling arguments: Cyber Security at ETH Zurich

The joint-degree Master's programme in cyber security trains the experts of tomorrow and offers a profound and in-depth education at one of the world's leading universities. A mandatory semester at ETH Zurich's sister university, EPFL, completes this unique study experience.

Starting point for future experts

Today, information technology is integral to both the economy and society as a whole. Unfortunately, this has led to a sharp increase in security attacks on systems, networks and software, thus making cyber security a more important topic than ever. Indeed, cyber security is now essential to the expansion of technologies and their acceptance by the information society.

Beyond enhancing existing systems, security technologies further enable new applications and have transformative effects on society by redefining and challenging trust relationships and assumptions. Moreover, security technologies are increasingly becoming business enablers. However, in order to select the correct security strategy for a given situation and then implement it successfully, it is vital to possess an in-depth understanding of the underlying concepts.

Students of this intense two-year joint-degree Master's programme learn to develop solutions for urgent security problems in computer systems, networks and their applications. They acquire the foundations of how to engineer a secure and future-proof information infrastructure and what is needed to promote trust.

The job market and career opportunities for cyber security graduates are excellent. Expertly trained security professionals are in high demand across all sectors and larger companies are increasingly using their expertise in strategic projects.

Learning from the best

The study programme is closely connected to the world-class research groups of ETH Zurich's Department of Computer Science and the School of Computer and Communication Sciences (IC) at EPFL, the Swiss Federal Institute of Technology in Lausanne. The research and teaching carried out at the department cover the whole spectrum of cyber security, from the mathematical foundations of cryptography to building solutions and dealing with pressing problems in

security networks, cyber-physical systems and applications.

The programme is linked to ETH Zurich's own competence centres such as the Institute of Information Security, the Zurich Information Security Center (ZISC) and the Risk Center. Each of these institutions maintains close contacts with industry, local research centres of international companies as well as with the authorities, the police, and the military.

Thanks to all these connections and collaborations, students profit from an encouraging environment with plenty of opportunities to quickly participate in exciting projects. Some may even seize the chance to develop their entrepreneurial spirit by being part of one of ETH Zurich's successful spin-off companies in the security sector.

Unique study environment

Studying at ETH Zurich is a unique experience. It is a highly stimulating place with a friendly, cooperative and respectful atmosphere that brings together students from all over the world. Two campus locations, both distinguished by their prominent position and modern infrastructures, are the perfect place for learning, research, and leisure. Professional administrative teams help students get started, provide individual student counselling and give out academic advice. Committed student associations and commissions offer support during learning and exam periods, help people connect, and contribute to a diverse and inspiring culture. ■



Shweta Shinde
Professor of Secure and Trustworthy Systems

"Security has become an integral part of all the technology that we use today. Studying theoretical and practical security aspects from the ground up is essential for safeguarding existing technology, building new secure systems, and identifying emerging threats. This Master's programme provides students with a solid foundation in security, thus empowering them to become effective practitioners and researchers."

Kenneth Paterson
Professor of Applied Cryptography

"Cryptography sits at the intersection of computer science and mathematics. It provides an underpinning science for the secure handling of data – whether that be data in communication, data at rest or data under computation. At ETH Zurich, we connect the science with the real world, studying how to make cryptography practical and secure to use in a broad range of applications, from online banking to secure cloud services. Our Master's programme provides a deep dive into this fascinating topic, covering both theoretical and practical aspects of the subject."



Adrian Perrig
Professor of Network Security

"With the rapid evolution of technologies, security continues to be intertwined with many aspects of our infrastructure and applications. Studying security thus continues to be an exciting topic for ensuring properties such as reliability, privacy or confidentiality of our data."

A department of international renown

Founded in 1981, the Department of Computer Science (D-INFK) today holds a leading position worldwide. For the joint-degree Master's programme in cyber security, the department joins forces with its younger sister, the School of Computer and Communication Sciences (IC) at EPFL, located in Lausanne.



Pioneering mission

Dedicated to undertaking basic research, the Department of Computer Science at ETH Zurich develops reliable, efficient and secure computer and IT solutions for use in society, industry and science. Moreover, while its main focus is on training computer scientists at the highest level, the department also provides computer science foundations to students of other disciplines, offers continuing education programmes and contributes to the high quality of general computer science education in local schools. It thus makes an important contribution to the excellence of education in society as a whole. While maintaining longstanding, traditional ties with electrical engineering and mathematics, department researchers increasingly interact with other disciplines including physics, mechanical engineering and the life sciences. In addition, the department collaborates with numerous external centres and labs when developing certain topics, as part of joint research programmes or during outreach activities. Latest examples include the ETH AI Center and the Cyber Defence Campus.

A faculty of global standing

More than 45 professors from all over the world conduct their research and teach at the Department of Computer Science at ETH Zurich. They are among the best in their field and span the many facets of modern computer science, from the underlying theory to the design and construction of practical systems. Boasting a consistently high international ranking, the department is widely considered to be one of the best places in the world in which to study and undertake research in computer science. Three hundred doctoral students and 110 post-doctoral and senior researchers contribute to maintaining the department's high level of teaching and research. Around 1,400 Bachelor's and 800 Master's students currently benefit from this excellent academic environment.



Strong research and business network

The department maintains strong ties with a wide network of top universities around the globe. Close cooperation with scientists abroad is an integral part of its research culture. This offers exciting prospects for students: they are able to enjoy lectures from international experts and experience collaborative learning with students from the best foreign universities. The department also participates in intensive research collaborations with global IT players and research centres, such as DisneyResearch|Studios, Microsoft, IBM, SAP and Google, and with financial service companies such as ZKB and SIX. Findings from such research flow directly into teaching.

Outstanding infrastructure

ETH Zurich offers state-of-the-art learning facilities, a modern infrastructure and highly qualified employees. One of its key strengths is the technology platforms that make specialist tools accessible. For instance, in the department's Computer Graphics Laboratory students can work with novel three-dimensional scanning technology developed at ETH Zurich. Students working on simulations and big data have access to its high-performance computing clusters, and for largescale projects it is even possible to access the Swiss National Supercomputing Centre.

www.inf.ethz.ch

Computer Science at EPFL:

School of Computer and Communication Sciences (IC)

EPFL's computer and communication sciences department is a global center for education and research that is shaping the future of computing, the technology that is changing the world. Located in Lausanne on beautiful lake Geneva, the IC School seeks world-changing breakthroughs and the widespread diffusion and adoption of its innovations. It puts ethical and public policy considerations at the center of its education and research agendas. The variety of courses at EPFL complement those at ETH Zürich.

ic.epfl.ch



A high-grade programme for future cyber security experts

The Master of Science in Cyber Security programme provides expert education from leading lecturers in the field of cyber security. This joint programme is offered by ETH Zurich in collaboration with EPFL.

Who can apply?

Applicants must hold a Bachelor's degree in computer science, or must have graduated with distinction from a related field such as electrical engineering, mechanical engineering, physics or mathematics. A strong background in both practical and theoretical topics from computer science and mathematics is required. Admissions decisions are based on the curriculum of the applicant's Bachelor's programme, the level of mastery reached in each subject, their personal statement of purpose, the submitted reference letters and the reputation of their graduating university, among other factors. For further details, candidates should refer to the admissions website.

Curriculum structure

Duration: 4 semesters
 ECTS credits: 120
 Language: English
 Degree: Master of Science ETH Zurich – EPFL in Computer Science Major in Cyber Security

Students enrolled in the programme at ETH Zurich spend one mandatory semester at EPFL, and vice versa.

This two-year Master's programme provides a thorough education and features a broad set of courses covering all areas of cyber security. To complement these subjects, students choose an additional area in computer science as a minor subject. A semester project and the Master's thesis provide students with an opportunity to apply their knowledge and skills.

Given the wide range of courses available and the flexible structure of the curriculum, students enjoy a large degree of freedom to customise their study plan according to their own interests.

The Master's programme is divided into several course categories. The minimum number of credits required for completing the degree are listed in the fields of the course categories. Several course categories are nested to provide more flexibility, since the minimum number of credits required within subordinate course categories do not always add up to the minimum number of credits required for the superordinate course category. The remaining credits can therefore be distributed freely over all subordinate course categories.

| | |
|--|-----|
| Master ETH Zurich – EPFL in Computer Science Major in Cyber Security | 120 |
| Core Courses and Electives in Cyber Security | 28 |
| Core Courses | 16 |
| Core Electives | |
| Seminar | 2 |
| Core Courses and Electives in a Minor | 18 |
| Core Courses | 8 |
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Course categories

The courses listed below constitute a snapshot of what is currently on offer; however, they are subject to change. Up-to-date course offerings can be viewed online in the ETH Zurich course catalogue (www.vvz.ethz.ch). For further details, please also refer to the study guide (www.inf.ethz.ch/master-cybsec).

Core courses and electives in cyber security

The Master's in Cyber Security programme combines theory with hands-on practice to provide students with a well-rounded education. The core courses form the basis of the programme and are aimed at imparting essential knowledge in the field of cyber security, and ensure that each student attains a high level of competence in this field.

Core courses:

- Applied cryptography
- Security engineering
- System security
- Network security

Elective courses:

- Cryptographic protocols
- Program analysis for system security and reliability
- Formal methods for information security
- Digital signatures
- Advanced topics in communication networks
- Hardware security
- Applied security laboratory
- Security of wireless networks

Seminars

Seminars serve to train students in how to read and understand scientific publications. They usually build on previously attended lectures and promote active discussion among participants. Seminars often cover recent developments in a particular subject, such as systems security or cryptography, and provide an interesting way to learn about cutting-edge research.

Core courses and electives in minor subjects

Students must choose one area of computer science (other than information security) as a minor subject in order to fulfil the minimum number of credits required. The remaining credits can be distributed freely over other minor subjects and their associated courses.

1. Data Management Systems

Modern data management involves a wide variety of systems and functionality that form the basis of any software endeavour. From machine learning to websites, from electronic commerce to the Internet of Things, any modern application involves the management of large amounts of data.

This track covers the design, development, use, operation and application of data-management systems, including relational database engines, data streaming engines, key value stores, noSQL, Spark/Hadoop and other big data platforms, as well as

semi-structured/graph data management systems. In terms of computing platforms, the track covers implementations ranging from single nodes to entire data centres, with a special emphasis placed on cloud computing. The track is organised to provide an in-depth look into data management systems via core courses, and to connect students, via elective courses, with relevant subjects closely related to modern data management systems.

Core courses:

- Big Data
- Data Management Systems
- Cloud Computing Architecture

Elective courses:

- Advanced Machine Learning
- System Security
- Deep Learning
- Design of Parallel and High-Performance Computing
- Informal Methods
- Advanced Operating Systems
- Principles of Distributed Computing

2. Machine Intelligence

Machine Intelligence pursues the goal of automatically creating models and design inference and decision procedures based on empirical evidence, i.e. data and human-provided knowledge. Notions of generalisation and learnability determine central conceptual challenges. Different modes of learning – including supervised, weakly supervised, unsupervised, online and adaptive learning – are studied through a rigorous mathematical and statistical framework.

The interplay of statistical estimation and computation touches on hardware architectures for machine learning, machine perception, high-performance computation and efficient information systems. An important aspect consists of developing intelligent systems that can cope with unstructured real-world data.

Core courses:

- Advanced Machine Learning
- Deep Learning
- Probabilistic Artificial Intelligence
- Machine Perception
- Optimisation for Data Science

Elective courses:

- Natural Language Processing
- Reliable and Trustworthy Intelligence
- Computer Vision
- Statistical Learning Theory
- Machine Learning for Health Care
- 3D Vision
- Guarantees for Machine Learning
- Artificial Intelligence in Learning
- Foundations of Reinforcement Learning
- Philosophy of Language and Computation
- Computational Semantics for Natural Language Processing
- Machine Learning for Genomics
- Interactive Machine Learning: Visualisation and Explainability
- Advanced Formal Language Theory
- Mathematics of Information
- Computational Statistics
- AI-Center Projects in Machine Learning Research

3. Visual and Interactive Computing

The digital processing of visual information has become a core topic in modern computer science and information technology. Building on theoretical foundations from computer science and applied mathematics, visual computing is central to a diverse array of application domains: image generation and analysis, computational photography, modelling and control of robotic systems, virtual and augmented reality, computational fabrication, user interfaces, interaction techniques and interactive devices, and more.

Methodologically, visual computing is rooted in computer graphics, algorithmic geometry, and digital image processing and computer vision. Strong conceptual and algorithmic links to computational sciences and machine learning provide visual computing with the tools that are necessary to solve large-scale visualisation and inference problems.

Core courses:

- Computer Graphics
- Computer Vision
- Shape Modelling and Geometry Processing
- Machine Perception
- Computational Models of Motion

Elective courses:

- Physically-Based Simulation in Computer Graphics
- Mathematical Foundations of Computer Graphics and Vision
- 3D Vision
- Mixed Reality
- Mobile Health and Activity Monitoring
- Interactive Machine Learning: Visualisation / Explainability
- Scientific Visualisation
- Virtual Humans
- Deep Learning for Autonomous Driving

4. Theoretical Computer Science

The goal of theoretical computer science is to understand the fundamental concepts of computation and information, which is comparable in spirit to the goal of physics: understanding fundamental concepts like matter and energy.

Topics include models of computation (from automata theory to quantum computers), algorithms and data structures, computability and computational complexity theory, information theory, and cryptography. Randomness is a core concept that spans all areas of theoretical computer science.

Core courses:

- Randomised Algorithms and Probabilistic Methods
- Advanced Machine Learning
- Geometry: Combinatorics and Algorithms
- Advanced Graph Algorithms and Optimisation
- Optimisation for Data Science
- Advanced Graph Algorithms and Optimisation

Elective courses:

- Probabilistic Methods in Combinatorics
- Cryptographic Protocols
- Approximation and Online Algorithms
- Algorithmics for Hard Problems
- Information Theory I
- Guarantees for Machine Learning
- Algebraic Methods in Combinatorics
- Linear and Combinatorial Optimisation
- Models of Computation
- Digital Signatures
- Graph Theory
- Network and Integer Optimisation: From Theory to Application
- Quantum Information Processing: Concepts

Interfocus courses

The interfocus courses cover cross-cutting computer science topics that are of central importance beyond cyber security and the chosen minor subject. They teach algorithmic reasoning – from real-world problems to algorithmic modelling and implementation – and introduce students to advanced systems design issues. The courses include:

- Algorithms Lab
- Information Security Lab
- Computational Intelligence Lab
- Advanced Systems Lab

Semester project

The semester project provides students with the opportunity to apply the knowledge and skills they have acquired over the course of the degree. They can gain hands-on experience by independently solving a technical-scientific problem.

Free elective courses

All Master's level courses offered by ETH Zurich, EPFL and the University of Zurich may be chosen as free elective courses. This gives students the freedom to select from a huge variety of topics and to broaden their interdisciplinary perspectives by gaining insights into other subjects and experiencing life at other universities.

Science in perspective

Science in perspective is an integral part of the curriculum. Students learn to understand and critically question the correlations between scientific knowledge, technological innovations, cultural contexts, individuals and society. Students have a free choice of two credits from the Department of Humanities, Social and Political Sciences (D-GESS).

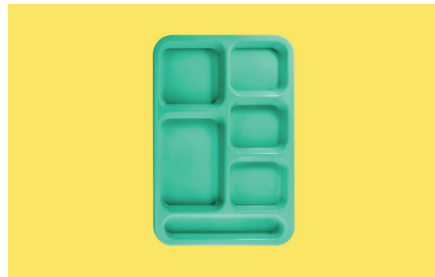
Master's thesis

The Master's thesis demonstrates that students are able to use the knowledge and skills they have acquired during their Master's studies to solve a complex cyber security problem. ■

Further Master's programmes

As an alternative to the Master of Science in Cyber Security described in this brochure, Bachelor's graduates can choose from three other Master's programmes offered by the Department of Computer Science in cooperation with other departments.

Consecutive:



Master of Science ETH in Computer Science

The general Master's in Computer Science is a broad programme with five different majors. Its structure allows students to choose from a variety of courses and to tailor the curriculum to meet their particular interests, needs and goals. The objective is to help students to receive an in-depth education in their field of choice while also becoming creative and efficient problem-solvers in the general domain of computer science. The Master's programme in computer science is offered by the Department of Computer Science (D-INFK) at ETH Zurich.

www.inf.ethz.ch/master-cs

With admission:

Master of Science ETH in Data Science

Computers have fundamentally changed the way we produce, manage, process and analyse data. In light of the continuous growth of data all around the globe, the question of how we can use it to gain valuable insights is more important than ever. How can relevant information be extracted from the massive amounts of data generated on a daily basis? In which ways can computers learn from experience to make intelligent decisions? These questions are key to the specialised data science Master's programme, which is jointly run by the Departments of Mathematics (D-MATH), Information Technology and Electrical Engineering (D-ITET), and Computer Science (D-INFK) at ETH Zurich.

www.inf.ethz.ch/data-science



Master of Science ETH in Robotics, Systems and Control

The development of intelligent robots and systems requires knowledge in diverse areas of expertise. It raises fundamental questions on how best to design, model and control complex and highly interactive systems. Bridging the gap between various engineering disciplines, this programme offers students a unique learning environment and a multi-disciplinary education that will enable them to develop innovative and intelligent products and systems to meet today's most pressing challenges: energy supply, the environment, health care and mobility. This specialised programme is offered jointly by the Departments of Mechanical and Process Engineering (D-MAVT), Information Technology and Electrical Engineering (D-ITET), and Computer Science (D-INFK) at ETH Zurich.

www.master-robotics.ethz.ch



Professional outlook and career opportunities

ETH graduates enjoy an excellent reputation both in Switzerland and worldwide. After completing their studies, cyber security graduates can expect to work in exciting roles in both industry and academic research around the world.

Excellent prospects

With the penetration of information technology into all areas of life, the growing complexity of platforms and networks, and the increasing amount of decentralised data storage, cyber threats have grown exponentially. At the same time, attacks are becoming ever more complex and challenging to defend against.

These trends have led to a massive increase in demand for cyber specialists over the last few years. Cyber security graduates can expect to enjoy excellent opportunities on the job market throughout all industries. After a few years gaining professional experience, they can look forward to getting fascinating and responsible jobs as experts or in leading positions.

A diversity of roles

The field of IT security is broad. In general, cyber security specialists help protect an organisation's information, data, networks and processes against attacks from cyber space and play a role in managing the recovery process when security incidents do occur. To fulfil their mission, experts with a wide range of skills such as IT security consultants, security architects, security engineers and security software developers work closely together.

Moreover, as the risk of abuses that can potentially significantly damage the economy and society increases, the need for and importance of cyber experts and IT forensic analysts working for the authorities, the police or military defence is also rising exponentially.

Entrepreneurial potential

Some computer scientists dream of founding their own company. To this end, ETH Zurich and its associated organisations offer students a wide range of courses and programmes to help them acquire the necessary knowledge and contacts for self-employment during their degree. Over the years, numerous former ETH computer scientists have established start-ups and ETH spin-offs in the security field, such as Anapaya Systems, 3db-access, Xorlab, Bug Bounty Hub, Futurae, ChainSecurity and FortIT.

A scientific career

Master's graduates who discover their passion for science during their studies can apply for a doctoral programme, either in one of the internationally renowned research groups of the Department of Computer Science or at another prestigious university. ■



Protecting critical infrastructures from cyber attacks is becoming increasingly important.

What students and alumni say

The student body is as international and diverse as the faculty, guaranteeing a stimulating study experience. Cyber security graduates can expect to work in exciting roles around the world.



Elisa Guerrant, 22
American, student

"Cyber security is unique compared to other areas of computer science because it is so closely intertwined with social dynamics, politics, mathematics, technology and many other areas, resulting in complex and multi-dimensional problems that can be approached from many different angles. Very few schools offer cyber security degrees at the Master's level – but ETH Zurich is one of them. It has a great selection of cyber security classes so that students can choose whether they want to focus on a certain area or study a wide variety of topics."



Fabian Zeindler, 32
Swiss, Lead Engineer Web Security at Open Systems

"From software engineering to consulting, through to actual hacking or even hardware engineering, cyber security is needed everywhere. I enjoy my work because it also involves scalability, reliability and operational practicability, in addition to security. This brings my team and me into contact with an array of different concepts and technologies. The threats are constantly evolving, which means it never gets repetitive or boring. ETH Zurich gave me the perfect toolkit for the job: a broad knowledge base and state-of-the-art cyber security expertise, plus adaptive and creative problem-solving skills. And the great friendships that developed over the course of my studies have been just as important."

Annika Glauser, 26
Swiss, Security Engineer at ti&m

"My job is exactly what I wanted: its primary focus is on security, I get to work with servers and networks and I am part of a specialised team shaped by close collaboration. My team is responsible for integrating security infrastructure into various projects. We're also the first line of defence against attacks. I am learning a lot and have already had the opportunity to take the lead on the security aspect of certain projects."

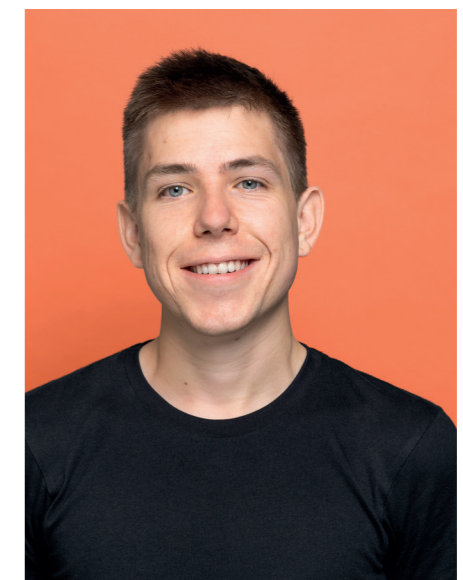


Karim Kabbani, 22
Swiss, student

"Cyber security feels like a game of chess. Whether you are playing offensively or defensively, you need to be good at both. I was interested in this field from the moment I started studying computer science and my interest has only grown stronger over the course of my studies. ETH Zurich offers courses on every aspect of cyber security and the professors are experts in their fields. This gives students a chance to work on interesting research projects. After I complete my studies, my dream is to join a large IT company and to contribute to something that could make a big impact on society."

Christian Knabenhans, 23
Swiss, student

"Pursuing my Master's in cyber security at ETH Zurich allowed me to gain a broad understanding of cyber security. The courses cover both established paradigms and the latest state-of-the-art developments in many areas, from high-level theoretical models to the security of real, tangible systems and protocols. The cyber security Master's students form a tight-knit community, which can really help you learn more efficiently and broaden your knowledge."



From science to business

Sometimes students develop an innovative product idea while undertaking university research. When this happens, ETH Zurich supports them in their efforts to transfer research results to industry, for example by licensing them to external companies or by supporting the researchers as they set up their own company.

To date, around 500 spin-offs have been created at ETH Zurich. Members of the Department of Computer Science have founded 50 of these.

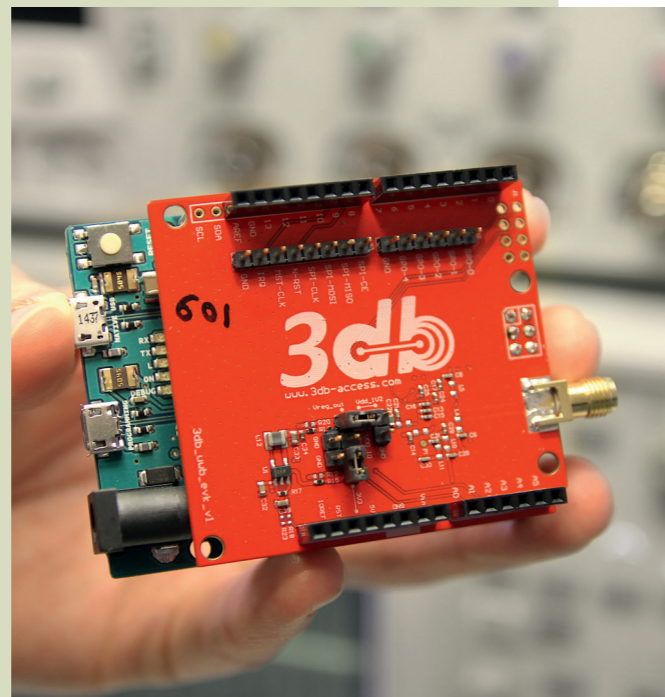
ETH Zurich offers its spin-off entrepreneurs valuable business advice, provides them with premises at a discounted rate and supports them in establishing important and useful contacts.

3db-access: burglar-proof car locking system

Nowadays, most cars can be unlocked practically by radio, without having to insert a car key. Such locking systems via ultra-wideband communication carry the risk that thieves can relay the correct signal and break into the car without the key actually being nearby. Founded in 2013, the ETH spin-off 3db-access has developed solutions providing secure ranging that simultaneously ensure minimal power consumption and thus a long battery life. Software and digital circuits are used to achieve protection, and even the smallest deviations are registered by their burglar-proof locking system. Today, several major car manufacturers use 3db applications in their cars.

The 3db-access system is a practical application of the results of scientific research carried out by ETH Zurich in the field of distance bounding. 3db's CEO and co-founder, Boris Danev, holds a doctoral degree from the Department of Computer Science.

www.3db-access.com



ChainSecurity: audits and services for blockchain security

Back in 2016, at the dawn of the Wild West of cryptocurrency crowdfunding, an attacker stole 150 million US dollars' worth of cryptocurrency by exploiting a vulnerability in an Ethereum smart contract. This marked the moment the public recognised the paramount importance of smart contract security. Petar Tsankov, a senior researcher at the Department of Computer Science, and his team created the world's first system able to mathematically prove that smart contracts are secure. In 2017, the enormous popularity of their work organically led to the incorporation of the ETH spin-off ChainSecurity, which in just two years became a world leader in smart contract security. In 2020 the company was acquired by PwC Switzerland to accelerate market growth and product development.

www.chainsecurity.com



Petar Tsankov, co-founder and chief scientist

Futurae Technologies: two-factor authentication for high security

Claudio Marforio and Nikos Karapanos are both alumni of the System Security Group and have conducted research on cryptography, mobile and web security. Together with Sandra Tobler, they co-founded Futurae Technologies, an ETH spin-off.

Futurae Technologies was established in 2016 with the goal of securing online access for everyone by using advanced security solutions that do not compromise on the customer experience. Futurae provides a modular authentication and transaction confirmation platform for web, mobile and future interfaces, such as smart speakers. The platform enables complete customer flexibility as they seek to authenticate their users, ranging all the way from hardware and smartphone tokens to innovative adaptive authentication and fraud-detection systems that protect online banking portals from identity theft, malicious transactions, and even social engineering attacks. Futurae's customers are renowned international companies in the financial services, health, education and public sectors.

www.futurae.com



ETH Zurich – where the future begins



Where once Albert Einstein studied and taught: the Main Building of ETH Zurich is one of the city's landmarks.

Freedom and personal responsibility, an entrepreneurial spirit and openness to the world: Switzerland's core values were also central to the foundation of ETH Zurich. The roots of this technical and scientific university go back to 1855, when the founders of modern Switzerland created this place of innovation and knowledge. At ETH Zurich today, students find an environment that demands independent thinking, while researchers enjoy a climate that inspires them to achieve excellence. Located at the heart of Europe and part of a worldwide network, ETH Zurich develops solutions for the global challenges of today and tomorrow.

For the benefit of society

ETH Zurich currently has over 22,500 students from more than 120 countries, of whom almost 4,500 are doctoral candidates. More than 520 professors teach and conduct research in the fields of engineering, architecture, mathematics, natural sciences, systems-oriented sciences, management and social sciences. The findings and innovations of ETH Zurich researchers are incorporated into some of the fastest-growing and most promising sectors of the Swiss economy: from IT, micro and nanotechnology to high-tech medicine. Each year, ETH applies for around 100 patents and 150 inventions. More than 500 spin-off companies have emerged from the university.

Top rankings

ETH Zurich is an institution with regional and national roots that is fully integrated into the international academic community. It measures itself in all respects against the world's leading universities – from its education and research to its management. In international rankings, ETH Zurich regularly features as one of the

best universities of technology and natural sciences in the world and as the leading university in its field in continental Europe.

Bright minds

The 21 Nobel laureates who have studied, taught or conducted research at ETH Zurich underline the excellent reputation of the university. Among the prize winners are Wilhelm Konrad Röntgen (1901), Albert Einstein (1921) and Kurt Wüthrich (2002). A Turing Award, popularly labelled the Nobel Prize in Computer Science, was awarded to Niklaus Wirth (1984), one of the earliest computer scientists and inventor of the Pascal programming language.

www.ethz.ch

EPFL at a glance

Students enrolling in the Master's programme in Zurich complete a mandatory semester at EPFL, ETH Zurich's sister university. EPFL is Europe's most cosmopolitan technical university equipped with state-of-the-art facilities. It welcomes students, professors and collaborators of more than 120 nationalities. EPFL has both a Swiss and international vocation and focuses on three missions: teaching, research and innovation.

EPFL collaborates with an important network of partners, including other universities and colleges, secondary schools and high schools, industry and the economy, political circles and the general public, with the aim of having a real impact on society.

www.epfl.ch

Living and studying in Switzerland

Everyday student life can be quite stressful and demanding. This makes it all the more important to have a well-organised learning setting, a strong social environment and a good balance between study and leisure time.

Where quality of life and beauty meet

Switzerland is famous for its political and economic stability, public safety and extraordinary beauty. National institutions like schools, healthcare providers and public transportation are of excellent quality. Many Swiss people are multilingual and, especially in the cities, English is often spoken. German is not required for a Master's programme at ETH, but a basic knowledge will help when settling in.

Zurich is Switzerland's largest city. It is truly international and ethnically diverse, offering a modern lifestyle and a vibrant nightlife. For many years, Zurich has been ranked among the top cities in the world for quality of life.

Centrally located with a view

ETH Zurich's campuses are distinguished by their central locations and are easily accessible by public transport. The Zentrum campus, with its historic Main Building, is within walking distance of the beautiful old town, which is replete with restaurants, cafés, museums and galleries. It is also close to a long promenade next to the lake that stretches more than 30 km towards the mountains.

A caring community

ETH provides a safe and pleasant environment that contributes to an inspirational learning experience. The university embraces diversity, and places strong emphasis on values such as respectful interaction as well as taking individual responsibility.

To enable growth and learning outside the classroom, ETH students and their associations provide a wide range of services for their peers. With networking events, parties, barbecues, dance classes, the photography lab, music rooms, cultural and artistic projects and the entrepreneur club, it is fair to say that there is something for everyone.



For brain, body and soul

Physical activity and a healthy lifestyle are part of the university's culture. The Academic Sports Association Zurich (ASVZ) provides state-of-the-art athletic facilities and over 120 different activities and sports, including outdoors, utilising Switzerland's beautiful mountain and lake landscape.

www.ethz.ch/student-life

Student life at EPFL

Located in Lausanne on beautiful lake Geneva, the main campus of EPFL is characterised by its sophisticated architecture with iconic flagship buildings such as the Rolex Learning Center or the ArtLab. An active student life, cultural and sports activities and a wide range of catering options are ensured.

www.epfl.ch/campus

Who? What? Where?

Address

ETH Zurich
Department of Computer Science
Universitätstrasse 6, CAB
8092 Zurich
Switzerland

Studies Administration Office

General questions, administrative concerns and study counselling
Bernadette Gianesi
master@inf.ethz.ch

Application and admission

Depending on the selected Master's programme and where the Bachelor's degree has been earned, a different admission process applies.

Bachelor's degree from ETH Zurich:

Some Master's degree programmes require a formal application, while others permit direct registration.

Bachelor's degree from other Swiss or foreign universities:

All students from other Swiss or foreign universities must apply at the Admissions Office.

Before starting the admission process, please check your eligibility:

www.inf.ethz.ch/admission-cybsec

Admissions Office

All information regarding the admission process is provided by the Admissions Office.

www.admission.ethz.ch

Admission deadlines

First application window:

1 November – 15 December mandatory for:

- students with a bachelor's degree from outside Switzerland
- students who wish to apply for the Excellence & Opportunity Scholarship programme (ESOP) or a Direct Doctorate programme (DD)
- Students with a Master's degree/PhD from a Swiss university who obtained their undergraduate degree outside Switzerland

Students with a Swiss Bachelor's degree are also welcome to apply during this period.

Second application window:

1 April – 30 April

Only available for students with a Swiss Bachelor's degree.

Dates are subject to change. Please visit the admission office website.

Financial information

ETH Zurich is committed to providing affordable education and, in contrast to most other top universities, keeps tuition fees to a minimum. Tuition and semester fees at ETH amount to around CHF 800 per semester. In addition, it is estimated that students spend CHF 20,000 to CHF 26,000 on study and living costs each year. www.ethz.ch/financial

Scholarships

It is primarily the responsibility of students and their families to finance their studies. If their means are insufficient, students may file a scholarship request or apply for the Excellence Scholarship & Opportunity Programme. www.ethz.ch/scholarships

Student organisations

www.vis.ethz.ch
www.vseth.ethz.ch
www.ethz.ch/int-student-associations

Committee for students without ETH Bachelor

vis.ethz.ch/moeb

Campus life

www.ethz.ch/student-life
www.asvz.ch
www.gastro.ethz.ch
www.bqm-bar.ch
www.ethz.ch/sph

Accommodation

www.wohnen.ethz.ch
www.woko.ch
www.wgzimmer.ch
www.students.ch
www.homegate.ch
www.ronorp.net

Social Media

www.facebook.com/ETHInformatik
www.x.com/csateth
www.youtube.com/ETHInformatik
www.linkedin.com/school/csateth

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