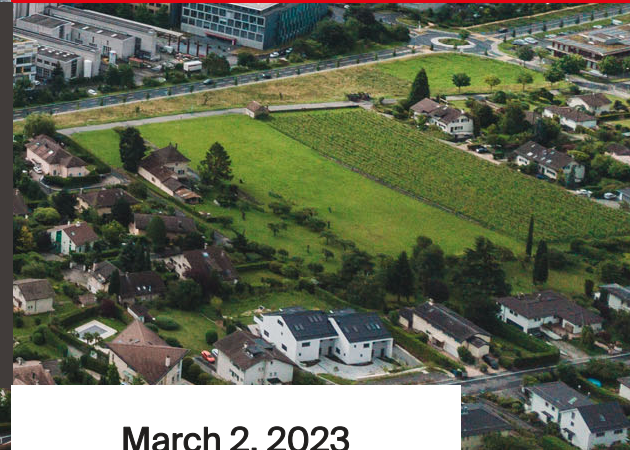


EPFL

Master Programs @ IC

Prof. Serge Vaudenay

March 2, 2023





School of Computer and Communication Sciences - IC

- Internationally highly ranked
- 55 professors
- Internationally recognized
- Strong industrial liaison
- Core + interdisciplinary science: Collaboration with Life Sciences, Mathematics, Microengineering, Electrical Engineering, etc.

Why choose IC ?

CS is everywhere:

- You can work as a Comp smallest farm, in the public

CS changes fast:

- You won't get bored.
- You can do many different

The world in general, and Swiss Scientists and Engineers:

- Jobs are easy to find (< 2 m
- Switzerland needs 10'000 fewer than **200** in the two CHF 130K after 3-4 years.

Date: 14.10.2019

LE TEMPS

25 Visionnaires pour la Suisse et l'Europe
1002 Lausanne
058 269 29 00
<https://www.letemps.ch/>

Genre de média: Médias imprimés
Type de média: Presse journ./hebd.
Tirage: 35'071
Parution: 6x/semaine

Page: 19
Surface: 53'186 mm²



Ordre: 1086739
N° de thème: 999.056

Référence: 75078903
Coupure Page: 1/2

Les entreprises s'arrachent les jeunes informaticiens

CAMILLE CHAPPUIS

RECRUTEMENT La 37^e édition du Forum **EPFL** s'est tenue en fin de semaine dernière au SwissTech Convention Center. Etudiants et recruteurs se sont rencontrés sur les stands des entreprises jeudi et vendredi. Constat: ces dernières déroulent le tapis rouge aux jeunes issus des filières informatiques

Elles représentent toutes une industrie différente, mais elles recherchent toutes la même chose. La semaine dernière, 190 entreprises étaient présentes au Swiss-Tech Convention Center à l'occasion de la 37^e édition du Forum **EPFL** pour tenter d'attirer les nouvelles recrues. Le constat

loppement de logiciels, apprentissage automatique – une des branches de l'intelligence artificielle – et technologie de l'information). Des branches devenues cruciales à l'heure du tournant numérique imposé aux sociétés.

Non seulement ce type de profils ont la cote, mais surtout ils ne sont pas aisés à recruter. Jennifer Naim, spécialiste en ressources humaines chez Sicpa, active dans les systèmes d'authentification, témoigne: «Nous sommes surtout connus pour nos activités en lien avec les encres de sécurité, mais nous avons de plus en plus de besoins dans le digital et dans le *software engineering*. Nous

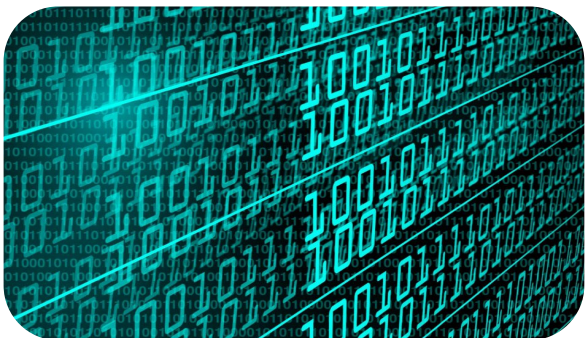
«Les personnes issues des domaines de l'informatique sont compliquées à recruter», confirme Franck Guérin, directeur de Continuum International, cabinet de chasseurs de têtes en Suisse romande et en France. D'une part, parce que le nombre de professionnels disponibles est faible par rapport à la forte demande des entreprises. «D'autre part, parce que, lassées d'être assaillies de sollicitations, notamment sur LinkedIn, ces personnes ne sont pas facilement atteignables», poursuit le chasseur de talents.

Tapis rouge pour les informaticiens...

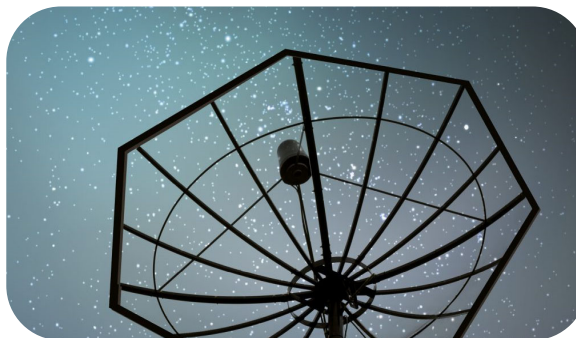
EPFL Our Master programs

4

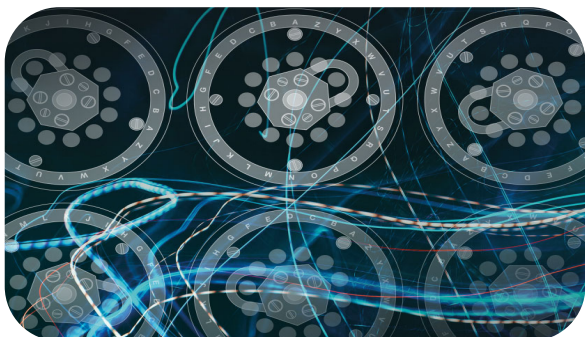
School of Computer & Communication Sciences



Computer Science
go.epfl.ch/master-IN



Communication Systems
go.epfl.ch/master-SC



Cyber Security
go.epfl.ch/master-cyber

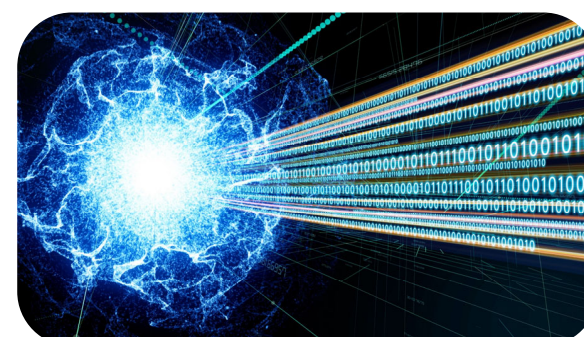


Data Science
go.epfl.ch/master-DS

Cross-School Programs
presented separately



Neuro_X (STI-SV-IC)



Quantum Science and
Engineering (IC-STI-SB)

EPFL Master in Computer Science with Specialization in Teaching in collaboration with HEP-VD

COMPUTER SCIENCE MASTER

COMMUNICATION SYSTEMS MASTER

DATA SCIENCE MASTER

This is a joint program between EPFL and HEP-VD to train high school teachers in Computer Science in Switzerland.

The program consists of 120 + 9 ECTS credits, with the first year corresponding to studies in Computer Science, Communication Systems or Data Science, and the second year composed of the Master project and specialization courses at HEP.

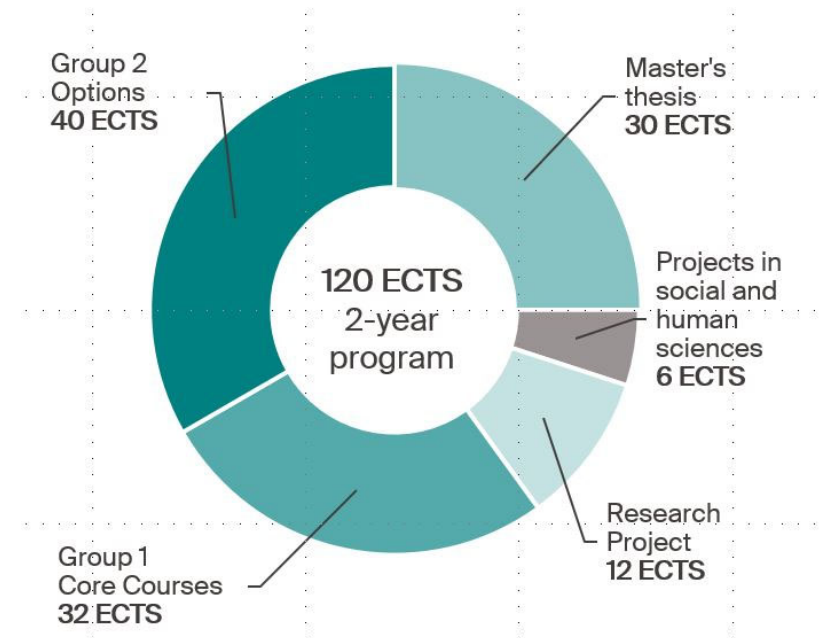
EPFL

hep/
haute
école
pédagogique
vaud

EPFL

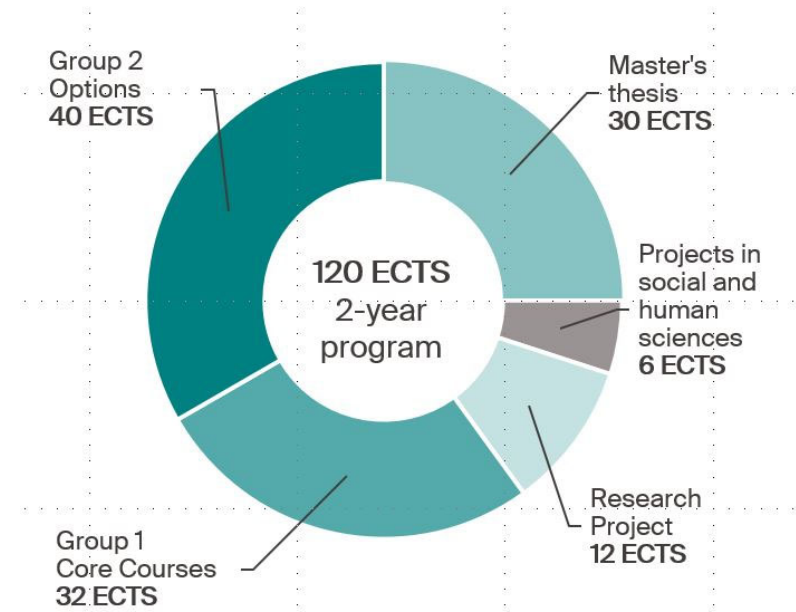
EPFL

- This Master's program offers a choice of courses that covers all aspects of the discipline, ranging from foundations of computer sciences, software and computer systems to big data and construction of software.
- Students may choose a 30 ECTS specialization or a minor included in the 120 ECTS.
- The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master's project.



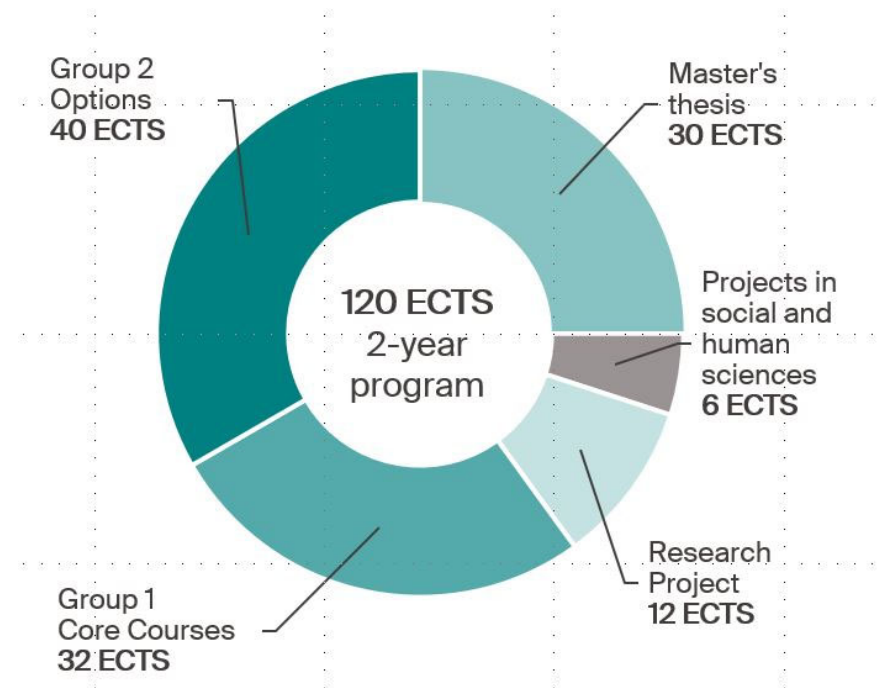
Core courses (min. 32 credits)	cr
Advanced algorithms	8
Advanced computer architecture	8
Cryptography and security	8
Decentralized systems engineering	8
Distributed algorithms	8
Information security and privacy	8
Machine learning	8
Modern natural language processing	8
Systems for data management and data science	8
TCP/IP networking	8

- This Master's program provides students with a unique education that places emphasis on the interdependence of mathematics, computer science and electrical engineering. It covers fields like wireless communications, networking and mobility, internet computing, information security and signal processing.
- Students may choose a 30 ECTS specialization or a minor included in the 120 ECTS.
- The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master's project.



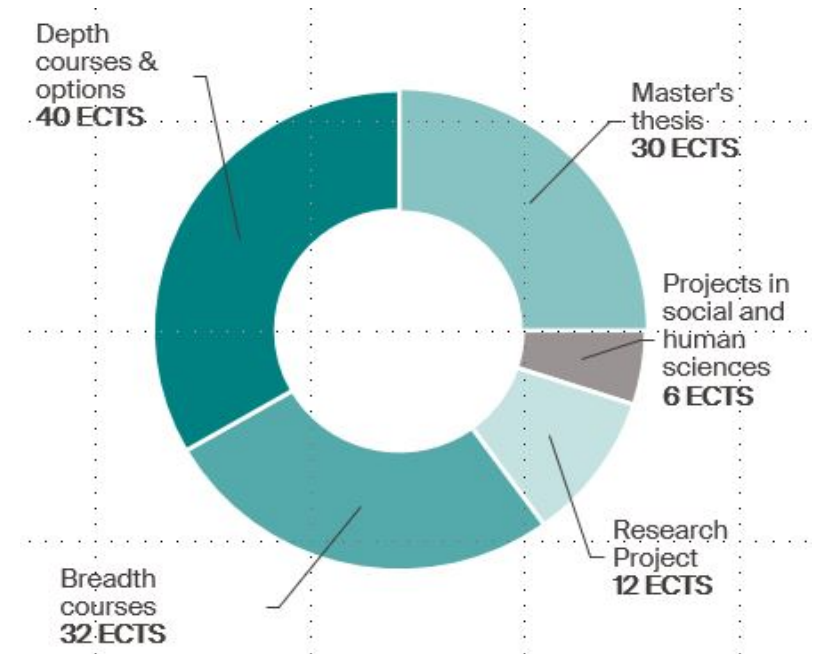
Core courses (min. 32 credits)	cr
Advanced algorithms	8
Advanced probability and applications	8
Cryptography and security	8
Distributed algorithms	8
Information security and privacy	8
Information theory and coding	8
Mobile networks	8
Modern digital communications	8
Machine learning	8
Statistical signal and data processing	8
TCP/IP networking	8

- The Master's program in data science equips students with all relevant knowledge and skills while combining theoretical foundations with practical experience. It covers a comprehensive education, from the foundations to implementation, from algorithms to database architecture, and from information theory to machine learning.
- Students may choose a 30 ECTS minor included in the 120 ECTS.
- The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master's project.



Core courses (min. 32 credits)	cr
Advanced algorithms	8
Applied data analysis	8
Information security and privacy	8
Foundations of data science	8
Machine learning	8
Modern natural language processing	8
Optimization for machine learning	8
Statistics for data science	8
Systems for data management and data science	8

- In collaboration with ETH Zürich, this joint-degree program offers a broad set of courses such as cryptography, formal methods, systems, network and wireless security. It aims to provide both foundational and applied knowledge in this quickly expanding domain by leveraging expertise from both universities.
- Students are required to spend at least one semester at ETH Zürich where they will take classes counting as breadth and depth courses.
- Upon graduation, students receive a joint Master of Science from both EPFL and ETHZ.
- The program includes a compulsory internship of eight weeks during the summer, or six months during the semester. The internship can also be combined with the master's project.



Breadth requirement (min. 32 credits)		cr
Advanced algorithms		8
Advanced computer architecture		8
Cryptography and security		8
Distributed algorithms		8
Decentralized systems engineering		8
Information security and privacy		8
Machine learning		8
Systems for data management and data science		8
TCP/IP networking		8
ETHZ courses counting as breadth requirement		

Prerequisite bachelor courses

- If you are thinking of changing your field of study, prepare by taking these prerequisite courses **during your bachelor**.
- Admission is competitive. We want to see that you do well in our courses and that you are motivated.
- **For computer science**
 - Software construction, 8 cr, 2nd year, fall
 - Algorithms, 8 cr, 2nd year, spring
 - Computer systems, 8 cr, 2nd year, spring
- **For cyber security**
 - Software construction, 8 cr, 2nd year, fall
 - Computer systems, 8 cr, 2nd year, spring
 - Computer security and privacy, 4 cr, 3rd year, fall
 - Algebra, 4 cr, 3rd year, fall (except for MA, PH, & CH)
- **For communications systems**
 - Computer systems, 8 cr, 2nd year, spring
 - Modèles stochastiques pour les communications, 6 cr, 3rd year, fall
 - Signal Processing, 8 cr, 2nd year, fall (except EL, MT, SV)
- **For data science**
 - Algorithms, 8 cr, 2nd year, spring
 - Data-Intensive systems, 6 cr, 3rd year, spring
 - Prob Stats, 6 cr, 2nd year, fall (only external EPFL candidates)

What happens if I do not take the prerequisites during my bachelor?

- Should you be admitted, your admission to the Master's program will be conditional on acquiring the additional credits.
- Priority must be given to acquiring these credits during your first-year of study.
- The credits will not count towards your Master's degree.
- You may take Master courses in parallel with your admission conditions, but it will be your responsibility to deal with schedule overlaps, etc.
- Admission conditions are non-negotiable and cannot be modified.
- **It's best to take these courses during your Bachelor to show your motivation to apply.**

Specializations and Minors

Specializations

- Computer engineering
- Computer science theory
- Cyber security
- Data analytics
- Foundations of software
- Internet information systems
- Networking and mobility
- Signals, images & interfaces
- Software systems
- Wireless communications

Some examples of Minors taken by IC students

- Computational Biology
- Computational Science & Eng.
- Financial Engineering
- Management, Technology and Entrepreneurship
- Mathematics
- Neuro-X
- Quantum Science & Eng.
- Spatial Technologies

Industry Internships

- Mandatory for all EPFL MS students since 2010
- Gain valuable work experience, develop and refines your skills
- Explore a career path
- Can be done in Switzerland or abroad. IC has a database of more than 3000 industry contacts
- Internship models:
 - Short, 8 weeks minimum during the summer
 - Long, 6 months during a semester
 - Integrated with your Master Project (26 weeks)

EPFL

MAKE CONTACTS IN THE INDUSTRY
 CONVERT ACADEMIC KNOWLEDGE INTO INDUSTRY SKILLS
 TRAVEL
 UNFORGETTABLE LIFE EXPERIENCE
 POSSIBLY LAND A FULL-TIME JOB

INTERNSHIP OFFICE ASSISTANCE
 MORE THAN 5'000 CONTACTS
 APPROXIMATELY 1'000 INTERNSHIP PROPOSALS PER YEAR

INTERNSHIP OF 8 WEEKS DURING THE SUMMER
 INTERNSHIP OF 6 MONTHS DURING THE SEMESTER
 MASTER'S PROJECT IN A COMPANY

Every year, more than 300 students do an internship or a master's project in a company in Switzerland or abroad



INDUSTRY INTERNSHIPS

GOOGLE, SWITZERLAND & USA
 FACEBOOK, USA & UK
 SWISSCOM DIGITAL LAB, SWITZERLAND
 IBM RESEARCH LAB, SWITZERLAND
 LOGITECH, SWITZERLAND
 NEC LABS, GERMANY, USA & JAPAN
 SONY, GERMANY & JAPAN
 ORACLE, SWITZERLAND
 UBISOFT, FRANCE
 CREDIT SUISSE, SWITZERLAND
 AMAZON, IRELAND, SPAIN
 MICROSOFT, USA & EUROPE
 DATHENA SCIENCE PTE LTD, SINGAPORE

Internships: Host testimonials

"Since we started hosting several interns as part of the EPFL internship program, we have been pleased with these students' hard work and contributions. I always enjoy interacting with these bright young students. We look for unique views these interns can bring. I hope they see IBM Research as a very exciting place to work."

Giovanni Pacifici, IBM T.J. Watson

"EPFL has been doing an excellent job at providing us the best internship candidates for our needs. Everything from selecting the candidates to managing administrative issues has been handled smoothly and efficiently, allowing us to focus on the students and the work to be done."

Stein Lundby, Qualcomm Inc.

EPFL Life after EPFL

15

COMPUTER SCIENCE

What I liked the most was everyone's commitment, the experience of being there with all these motivated people.

Acacio Da Silva Martins
Senior Software Engineer, AdNovum



DATA SCIENCE

I feel like I have a tailored, personalized master's degree with exactly the courses I wanted. It's the dream scenario.

Emma Lejal Glaude
Data, Analytics and AI Engineer, Swisscom



CYBER SECURITY

The teaching team is really great, it's so motivating to be working alongside the very best and life on campus is excellent. There is some much to do!

Mathilde Aliénor Raynal
PhD student, EPFL Doctoral program in computer and communication sciences



COMMUNICATION SYSTEMS

It's been almost 10 years since my master's and our group are still very good friends, even if we are spread out all around the world!

Arthur Germain
CEO, OneDoc



Minors offered by IC

- We also offer several minors. This can be a very good option if are hesitant to change section.
- Condition: min 30 credits from a list of pre-defined courses in:
 - Computer science
 - Communication systems
 - Data science
 - Cyber security
 - Computational biology

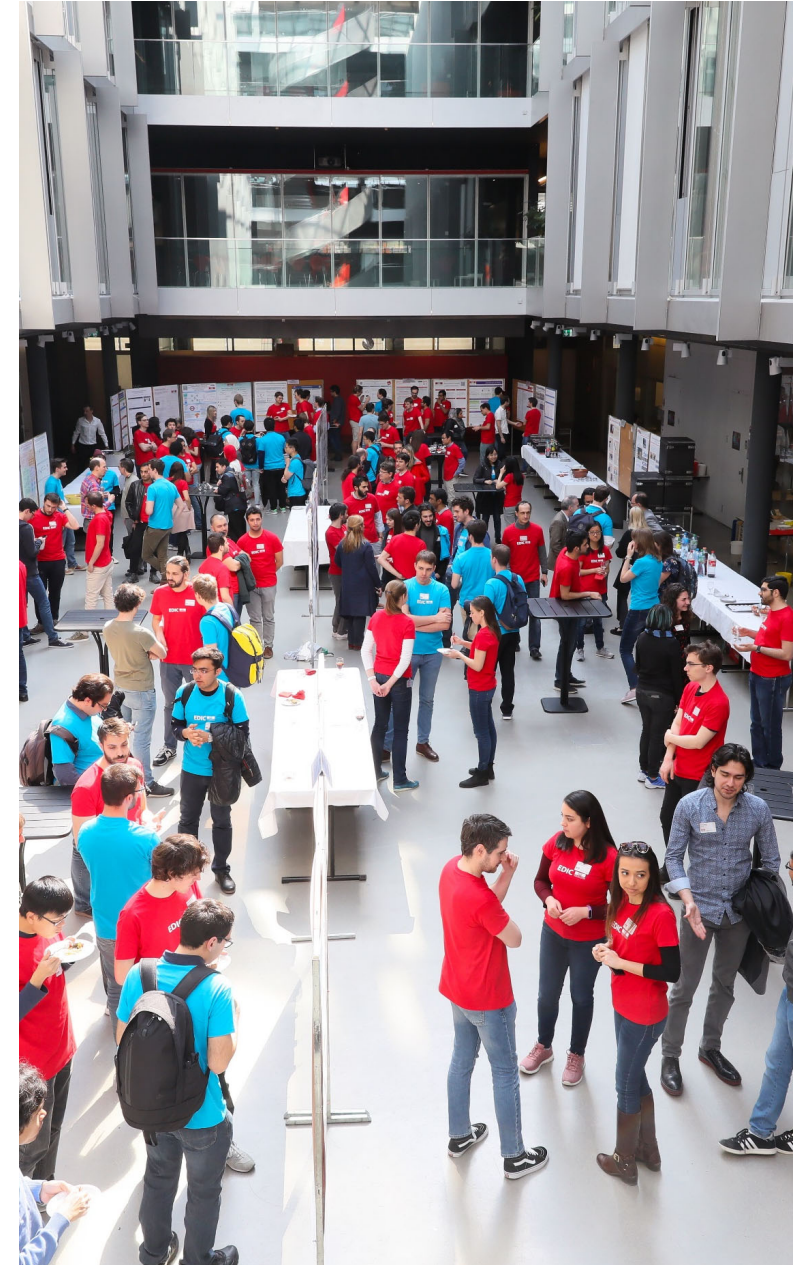
EPFL How to apply - Master?

go.epfl.ch/master-application

- 1st admission cycle
 - deadline December 15
- 2nd admission cycle
 - deadline April 15

Criteria for admission

- Necessary requirement min. GPA 4.5
- Taken some BS prerequisite courses with good results
- Quality of application, relevance of BS program compared to the MS cursus of interest, motivation, ...



EPFL



Merci