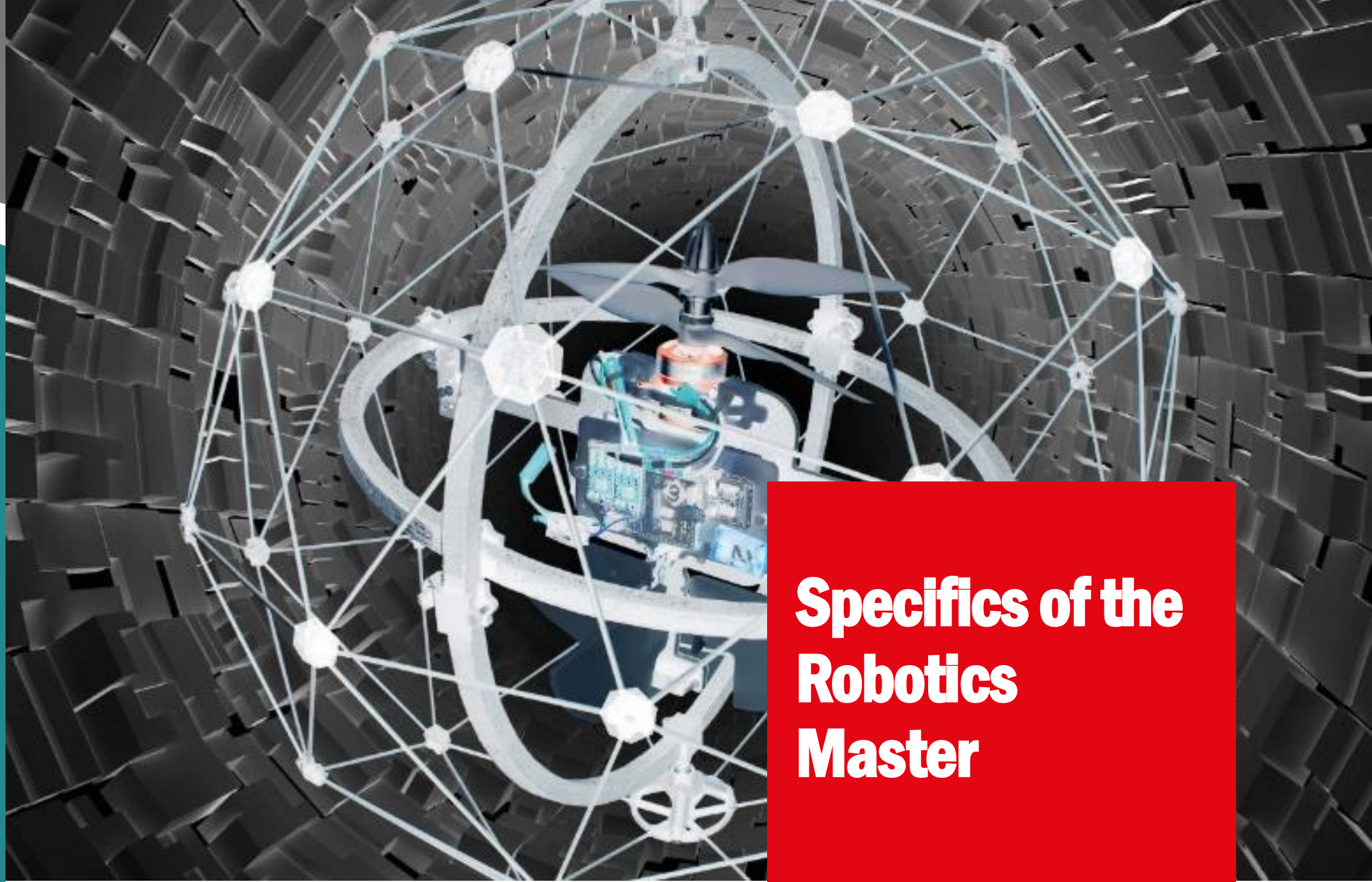
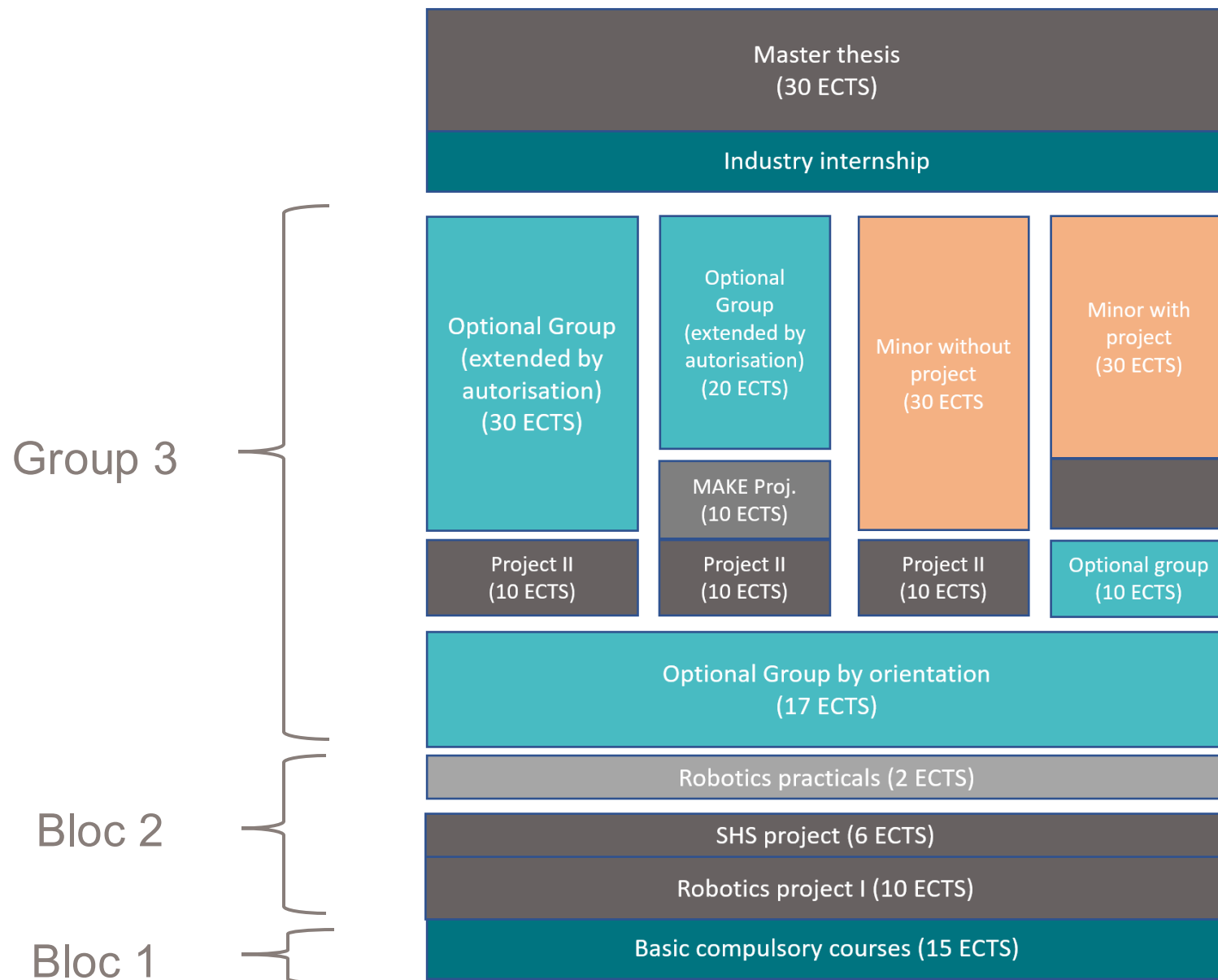


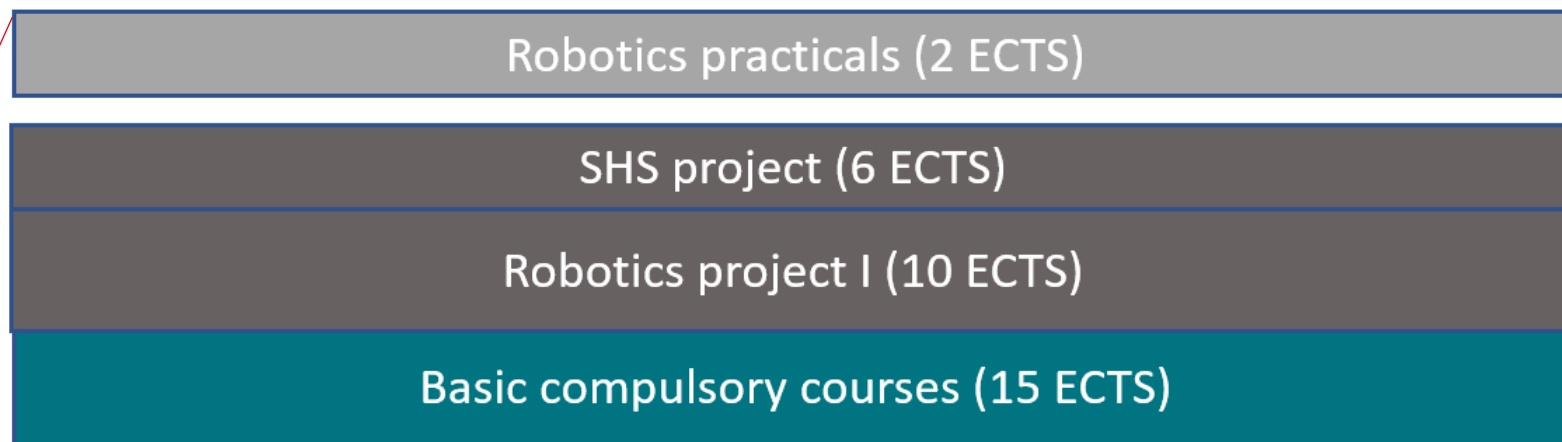
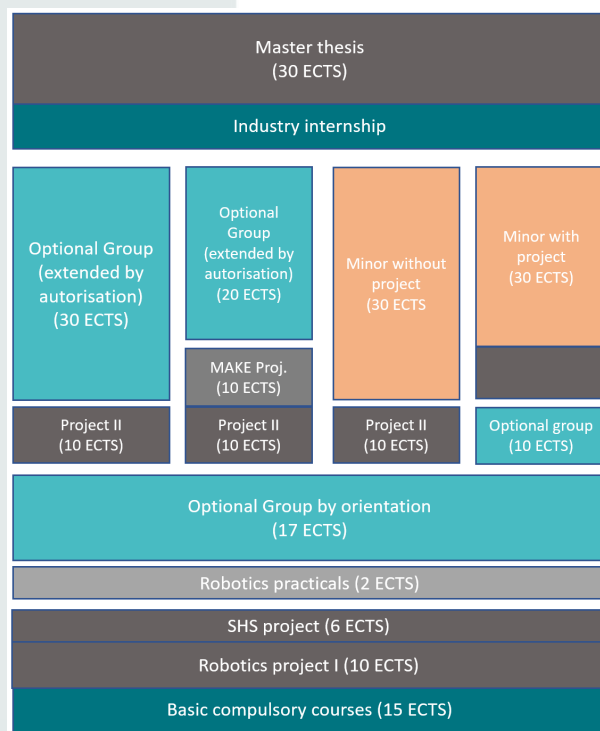


Specifics of the Robotics Master

Master Program structure



Structure



Compulsory courses

Foundations :

- Basics of Mobile Robotics (4 ECTS; Mondada) – fall
- Basics of robotics for manipulation (3 ECTS; Bouri) – fall

Algorithms and Methods for Robotics :

- Applied machine learning (4 ECTS; Billard) – fall
- Model Predictive Control (4 ECTS; Jones) – fall

Practicals:

- Robotics Practicals (2 ECTS; Mondada + all) - spring

Orientations

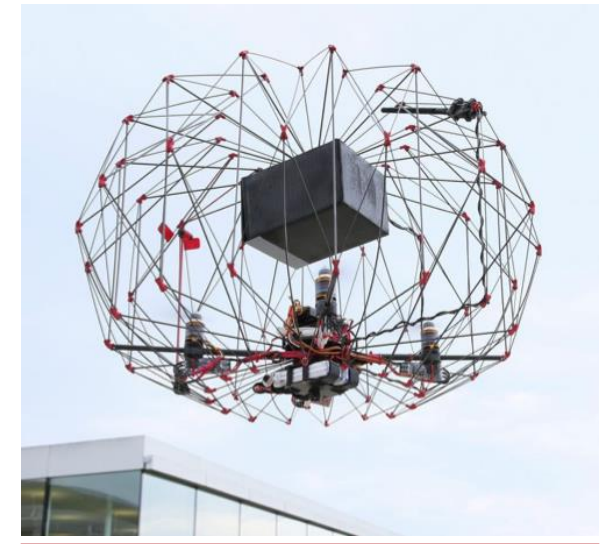
17 optional credits chosen among the optional courses of the chosen orientation, then free choice in robotics options.



Industrial Robotics



Medical Robotics

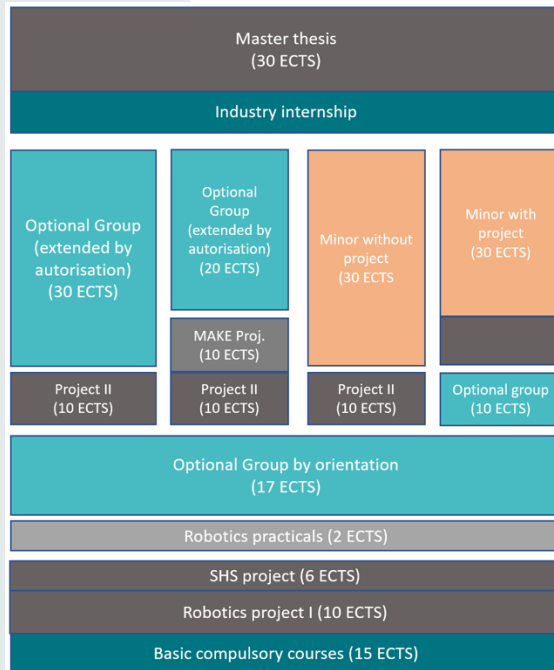


Mobile robotics

Orientations

Students must choose 17 ECTS of optional courses in one of these three orientations:

- A Industrial robotics
- B Medical robotics
- C Mobile robotics



Groupe à options
 Grand choix de cours
 (17 ECTS)

Optional courses and orientation	A	B	C	59
Advanced control systems	A	B	C	3
Advanced machine learning	A	B	C	4
Advanced MEMS & microsystems			C	3
Advanced satellite positioning			C	4
Analyse de produits et systèmes	A			2
Analysis and modeling of locomotion		B	C	4
Biomaterials		B		4
Commande embarquée de moteurs	A			2
Computational motor control		B	C	4
Computer vision	A	B	C	4
Conception mécanique intégrée	A			3
Continuous improvement of manufacturing systems	A			4
Controlling behavior in animal and robots		B	C	4
Deep learning	A	B	C	4
Distributed intelligent systems			C	5
Embedded systems	A	B	C	4
Evolutionary robotics			C	3
Flexible bioelectronics		B		4
Flying robots			C	4
Fundamentals of computer aided manufacturing	A			5
Fundamentals of neuroengineering			C	4
Haptic human robot interfaces	A			3
How technology shapes the workplace of the future	A	B	C	3
Image analysis and pattern recognition		B	C	4
Image processing I		B		3
Image processing II		B		3
Industrial automation	A			3
Industry dynamics, models & trends	A			4
Intelligent agents	A		C	6
Interdisciplinary project				10
Production management	A			5
Real-time embedded systems	A	B	C	4
Robotique industrielle et appliquée	A			2
Sensorimotor neuroprosthetics		B		4
Sensor orientation			C	4
Sensors in medical instrumentation		B		3
Signal processing for functional brain imaging		B		3
System identification	A	B	C	3
Systèmes mécatroniques	A	B	C	5

Master in Robotics - Orientations

Options group : Fall

17-47

Options group : Spring

A: Industrial robotics

Commande embarqués moteurs

Intelligent agents

Production management

Image processing I

Applied data analysis
Commande non-linéaire
Systems programming for systems on a chip

Machine learning programming
Managment de projet et analyse du risque
Mechanical product design and development

B: Medical robotics

Basics of
Bioinstrumentation

Neural interfaces

Neural signals and
signal processing

Numerical methods
in biomechanics

Introduction to
bioengineering

Sensors in medical
instrumentation

Image processing II

Advanced mecanisms for extreme
environments
Controlling behavior of animals and robots
Computational motor control

Deep learning for optical imaging
Machine learning programming
Micro/nanorobotics
Embedded systems design

C: Mobile robotics

Multivariable control

Intelligent agents

Legged robots

Networked control
systems

Principles of finance

Deep learning for
autonomous vehicles

Advanced MEMS and
microsystems

Deep learning

Lifecycle performance of
products systems

Sensor orientation

Advanced Satellite
positioning

Learning and adaptive
control for robots

Aerial robotics

Evolutionary robotics

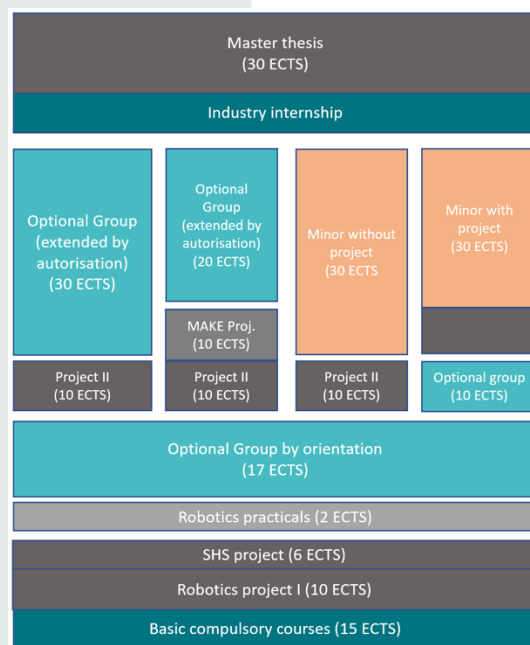
Distributed intelligent
systems

Image analysis and pattern recognition
Organic and printed electronics
Translational neuroengineering

Reinforcement learning
Software architecture
Systèmes mécatroniques
System identification

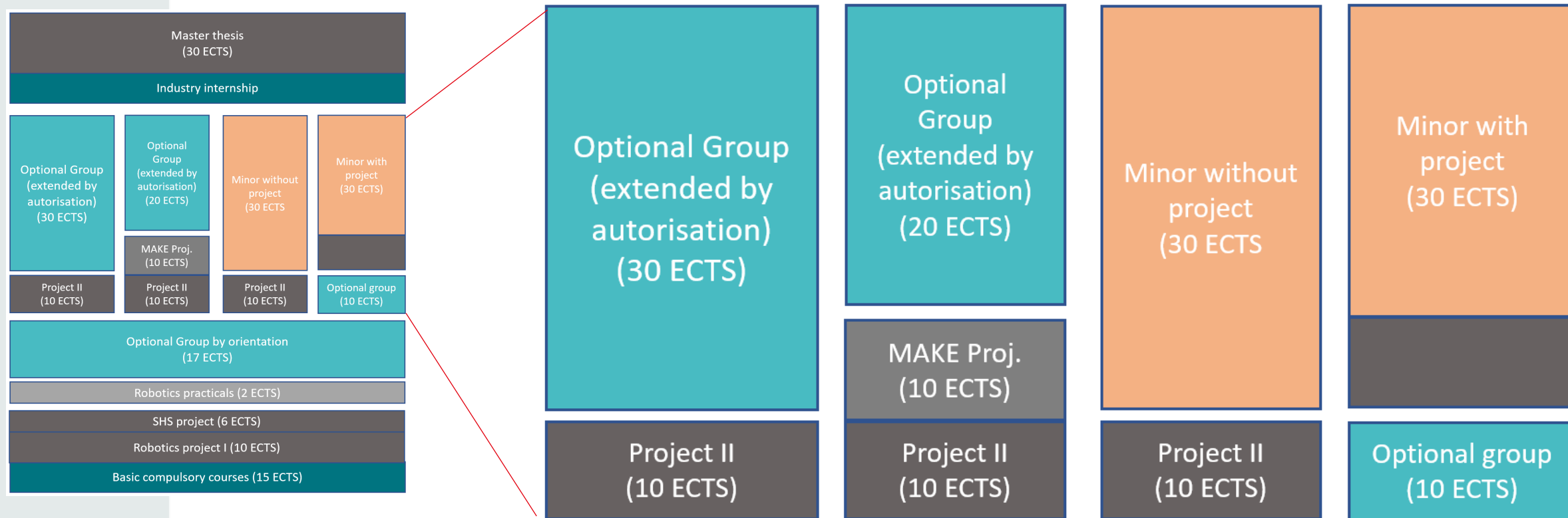
Advanced control systems
Machine learning II
Computer vision
Convex optimization

Orientation courses examples



2021-2022	ROBOTICS - Options		
Code	Matières	Enseignants	Crédits
MICRO-502	Aerial robotics	Floreano	3
MICRO-515	Evolutionary robotics	Floreano	3
MICRO-570	Advanced machine learning	Billard	4
EE-559	Deep learning	Fleuret	4
MICRO-514	Flexible bioelectronics	Lacour S.	4
EE-451	Image analysis and pattern recognition	Thiran J.-P.	4
MICRO-462	Learning and adaptative control for robots	Billard	4
MICRO-455	Applied machine learning	Billard	4
MICRO-553	Haptic human robot interfaces	Bouri	3
MICRO-401	Machine learning programming	Billard	2
BIOENG-404	Analysis and modelling of locomotion	Aminian/Ijspeert/Courtine	4
BIOENG-456	Controlling behavior in animals and robots	Ramdyia	4
CIVIL-459	Deep learning for autonomous vehicles	Alexandre Alahi	6
ENG-466	Distributed intelligent systems	Martinoli	5
CS-487	Industrial automation	Tournier/Sommer	3
MICRO-507	Legged robots	Ijspeert	3
ENV-548	Sensor orientation	Skaloud	4

Free options



Alumni careers

Careers after EPFL's MA Program in Robotics

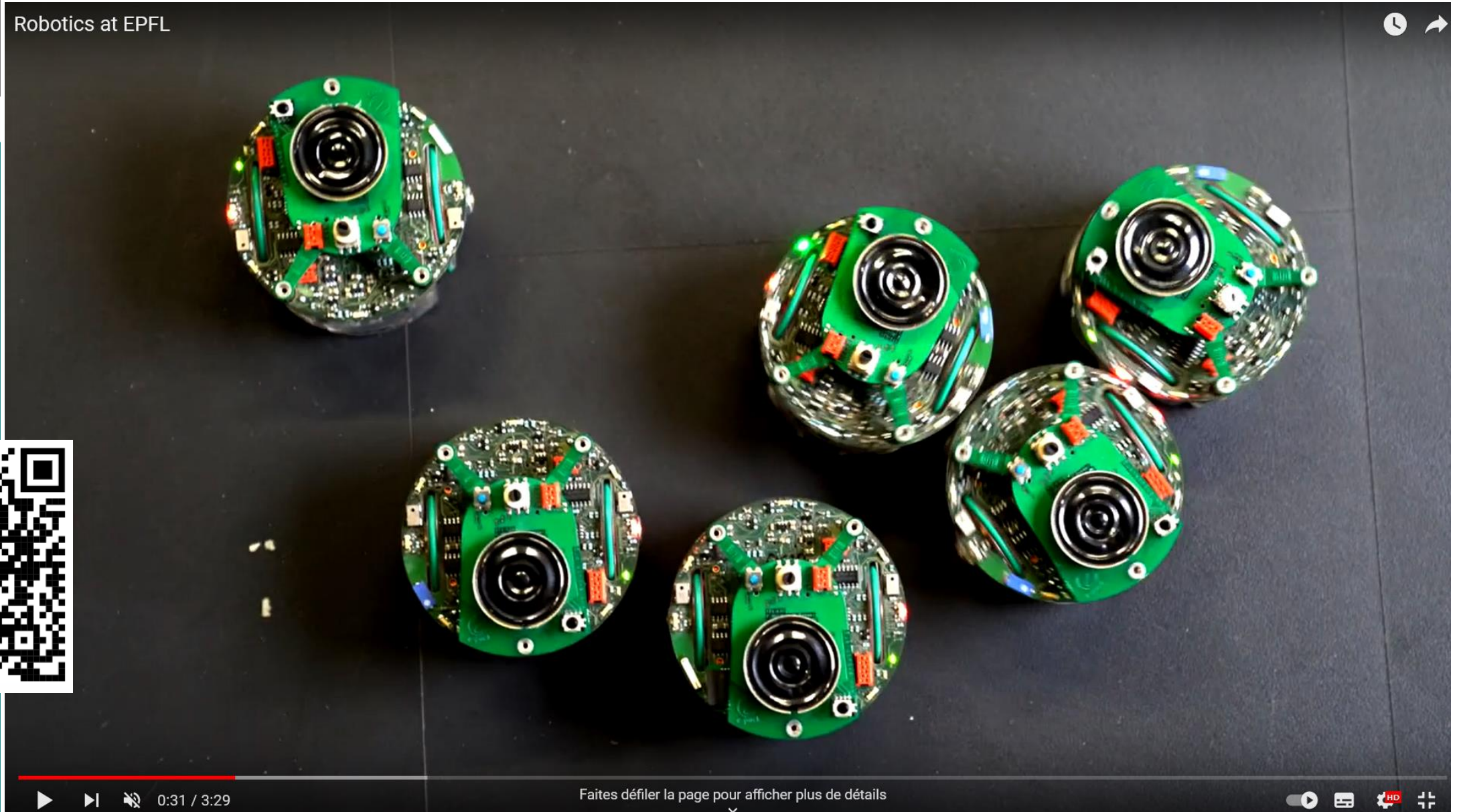


Alumni careers (graduated in 2020 and 2021)

42matters	EPFL	Philip Morris
Aircall	ETHZ	Pilatus Aircraft Ltd
Alpine Intuition	Flyability	Pix4D
Alpine Intuition	Flybotix	Precitrame Machines SA
Anaglyph Ltd	Freshape	Qwestive
ANYBotics	GF Machining Solutions	Rolex
Bain & Company	Hamilton Medical	Scandit
Beaver Innovation	Harvard University	SCS - Supercomputing Systems AG
Biped AI	Imperial College	Selexis SA
BLUE ORIGIN	Koenigsegg Automotive AB	SHL Medical
Capgemini	Kudelski Group	Sonova Group
CERN	LAAS-CNRS	Spes Robotics
China Nanhu Academy of Electronics and Information Technology	Logitech	Strategy&
ClearSpace	Magnebotix AG	Swisscom
CORTEXIA	Meta	Technis
Credit Suisse	Metaphysiks Engineering SA	Tesla
Datwyler Group	Mikron	Typeless
Décovi SA	MOBBOT	Universidad del País Vasco
DragonBox Kahoot!	myBrain Technologies	Université Paris-Saclay
ei3	OHB SE	University of Oxford
Embedded Factory	Omnisense SA	USI Università della Svizzera italiana
	Open Web Technology	Wearin'

Short Movie to learn more

Robotics at EPFL



Student Testimony



Sébastien de Rivaz
about the Robotics Master



Student Testimony



[Arwen Blanche Giraud](#)
about the Robotics Master





Adrien Briod

Founder and CTO Flyability
Master Microtechnique 2009
Doctorat EPFL 2013

