

# THE PHD PROGRAM IN COMPUTER AND CONTROL ENGINEERING

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**ENGINEERING (DAUIN)**

**9.1.2018**



# AGENDA

- The PhD program in Computer and Control Engineering
- The next Call for Applicants
- Goals and life of a PhD student



# PHD

- It is the 3rd level in the university curricula
- It aims at training students to become researchers
  - In academia
  - In industry
- PhD students are a major resource in all research universities worldwide
- The PhD degree is crucial
  - For any further career in any university
  - In many industries worldwide
- POLITO is investing significant resources to support its PhD programs



# DOING RESEARCH



## It means:

- Identifying problems (strong interaction with companies and research centers is crucial)
- Knowing the state-of-the-art in the area
- Devising, developing and evaluating innovative ideas and solutions
- Discussing and promoting them in the worldwide research community (e.g., presenting his/her work at conferences)
- Interacting with other researchers from industry or academia
- Attracting resources (i.e., preparing successful research projects)
- Tutoring students
- ...

# PHD LIFE

## Each PhD student

- is followed by a supervisor
- works on a specific research project
- is integrated and works in a research group
- learns how to make research (by doing it!)
- follows some ad hoc courses (on specialized or interdisciplinary topics)
- may also be involved in some active teaching activities (e.g., following labs).



# PHD GOALS



The goal of a PhD student is to learn how to make research

Hence, he/she is expected to

- become aware of the status of the art in his/her research area
- develop new ideas
- prove their effectiveness/limitations (normally in an experimental manner)
- submit papers to conferences and journals
- present papers at conferences and interact with the worldwide research community in his/her field

**PhD students are also typically involved in research projects**

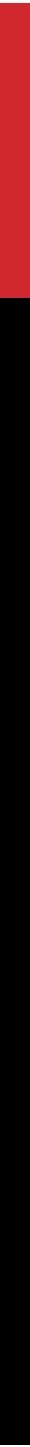
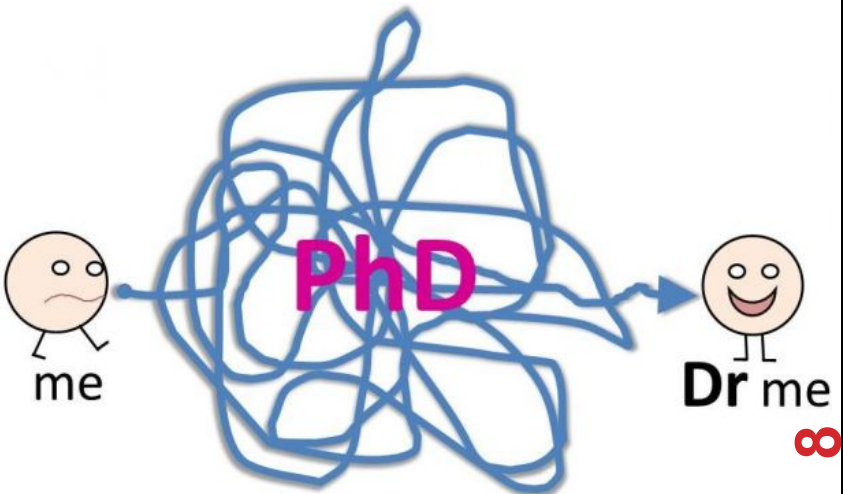
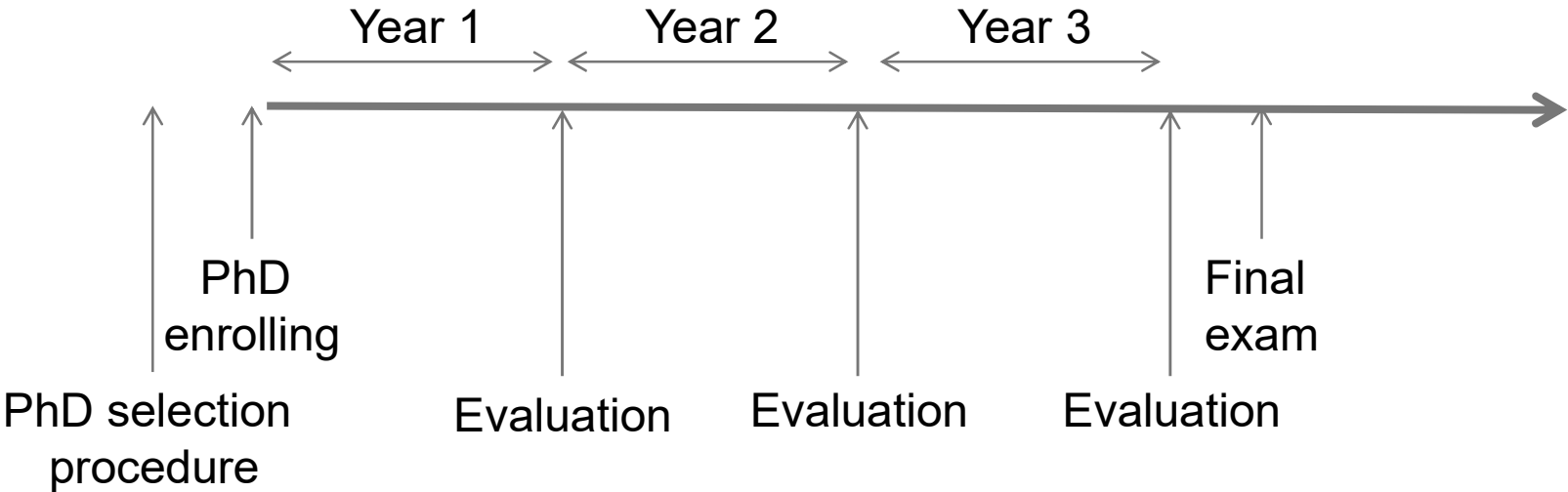
- with companies
- funded by public bodies (e.g., the European Commission).

# PHD GRANTS

- They amount to about 1,300 € / months (net)
- This amount is increased by 50% during the period the student possibly stays abroad during his/her PhD
- Each student may receive extra money for his/her possible teaching activities
- Additional awards are also available for the best PhD students.



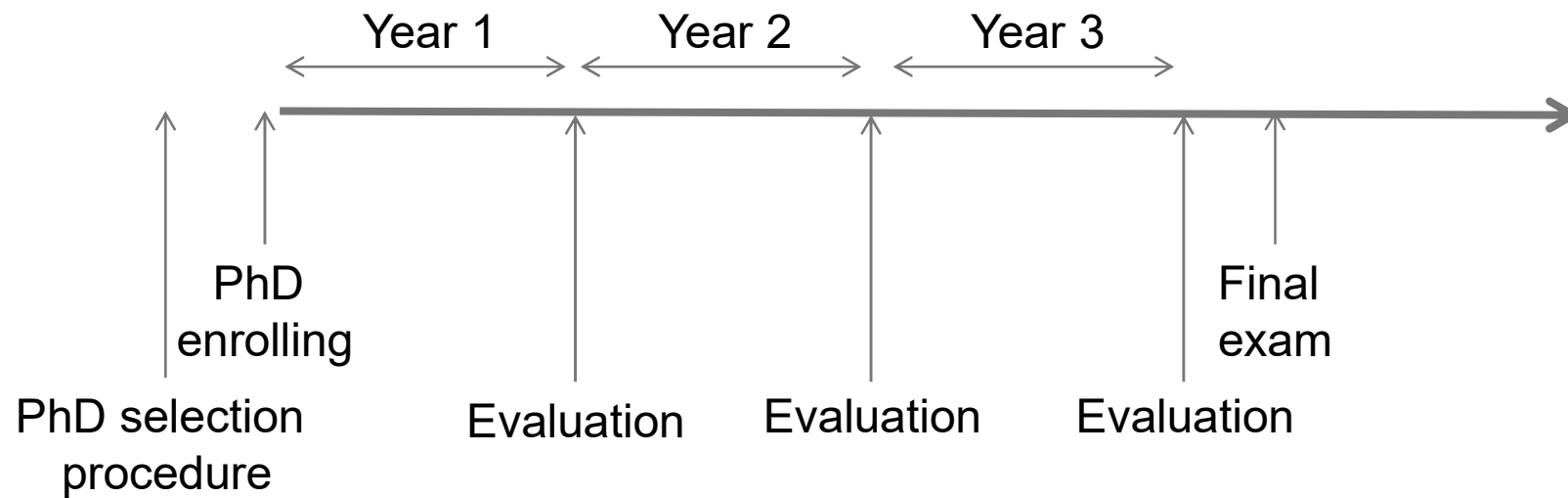
# PHD CAREER





Each year starts on  
Nov. 1

# PHD CAREER



# THE FINAL EXAM



**At the end of his/her PhD period the student**

- is evaluated by the PhD committee
- if the evaluation is positive, he/she prepares a thesis describing his/her work and achievements
- the thesis and his/her achievements are evaluated by two independent reviewers
- if the evaluation is positive, he/she discusses his/her work in front of a commission composed of internal/external researchers
- if the evaluation is positive, he/she receives the PhD degree.

# PHD CURRICULUM IN COMPUTER AND CONTROL ENGINEERING

**It aims at training new researchers in the area of**

- Computer engineering
- Control engineering
- Operational research

**It is managed by the Dept. of Control and Computer Engineering (DAUIN)**

**About 15 PhD positions with grants will be open this year**

**Grants will come from**

- Public bodies (POLITO, Eurecom, ISMB, Città di Torino)
- Companies.

# PHD SELECTION

It is based on the candidate CV and on an interview.

During 2018 it will be performed twice:

- In February/March (the Call will be published in January)
- In June/July (the Call will be published in May)

**The main steps for the first 2018 selection procedure are**

1. NOW: The PhD committee selects and publishes a set of topics suitable for PhD activities (each with an associated advisor)
2. February XX: deadline for submitting applications
3. February/March: a selection committee ranks the applicants and selects the new students, based on their CV and an interview; some minimum requirements are defined and preliminarily checked by Scudo
4. May 1: selected students start their activities with a temporary grant
5. Steps 1 to 3 are repeated for the spring call for applicants
6. November 1: the new students officially enroll as PhD students; each new student is assigned to the corresponding advisor



# PHD SELECTION

It is based on the candidate's research proposal

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## Suggestions

1. Look at the research proposals and select those you are interested in
2. Enter in touch with the corresponding advisor
3. Apply

# TOPICS FOR NEW PHD POSITIONS (I)

Taken from <http://www.phd-dauin.polito.it/proposals.php>

- **Augmented Cognition: Design Principles for Human-Computer Interaction**
- **Optimizing Computing and Communication Infrastructure for Service Robotics**
- **Bilevel stochastic optimization problems for Urban Mobility and City Logistics**
- **Image processing** for machine vision applications
- **Learning Analytics**
- **Summarization of heterogeneous data**

# TOPICS FOR NEW PHD POSITIONS (II)

- Models and methods for **Lean Business and Innovation Management**
- Deep **Neural Network** models for **speaker recognition**
- Optimization models and algorithms for **synchro-modal network problems**
- Cross-layer Lifetime **Adaptable Systems**
- Functional safety of electronic systems in **autonomous and semi-autonomous cars**
- Conversational agents meet knowledge graphs
- Big Crisis **Data Analytics**

# TOPICS FOR NEW PHD POSITIONS (III)

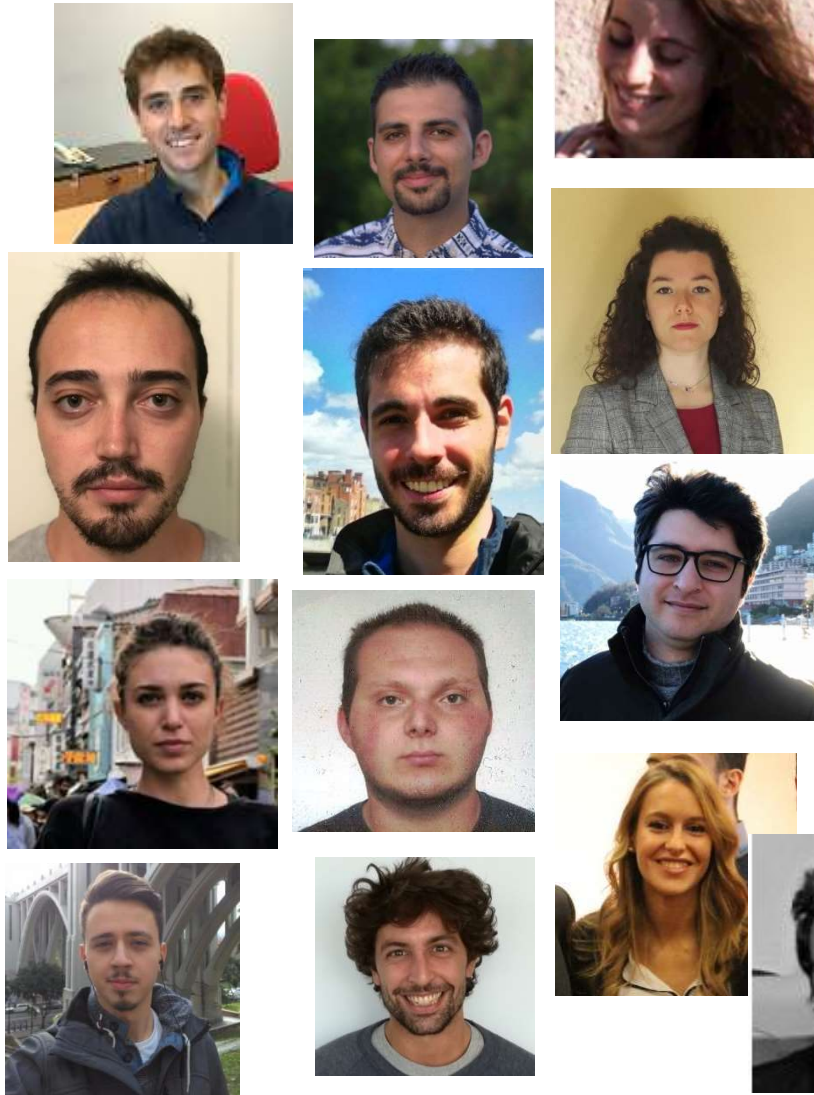
- Automatic and Context-aware Orchestration for **Fog Computing Services**
- New methods for set-membership system identification and data-driven **robust control design**
- Quality and policy assurance in critical **distributed systems**
- **Virtual, Augmented and Mixed Reality** for education and training
- Human-centered visualization and interaction methods for **Smart Data applications**
- **Deep learning techniques** for fine-grained object detection and classification in image analysis



# TOPICS FOR NEW PHD POSITIONS (IV)

- Efficient Functional Model-Driven **Networking**
- Algorithms and software infrastructures for manufacturing process modelling from **IoT** data streams in smart industry applications
- Dynamic and Adaptive User Interfaces for the **Internet of Things**
- ICT for Urban Sustainability
- Hardware assisted **security** in **embedded systems**
- Industrial **machine learning**
- Modelling cancer evolution through the development of artificial intelligence-based techniques
- **Biometrics** in the wild

# LIST OF NEW PHD STUDENTS FOR 2017



Student		Advisor	Grant type
BALLATI	FABIO	CORNO	POLITO
BERETTA	ELENA	DE MARTIN	Fondazione Bruno Kessler
BOZZOLI	LUDOVICA	STERPONE	POLITO
DAMLJANOVIC	ALEKSA	SQUILLERO	RESCUE
DE PACE	FRANCESCO	SANNA	POLITO
FARASIN	ALESSANDRO	GARZA	POLITO
FLORIDIA	ANDREA	SANCHEZ	POLITO
GHAZI VAKILI	MOHAMMAD	DEMARTINI	ISMB
GIUSTO	EDOARDO	REBAUDENGO	POLITO
GRIMALDI	MATTEO	MACII E.	POLITO
LANGE	Thomas	STERPONE	RESCUE
LOVINO	MARTA	MACII E.	POLITO
PASINI	ANDREA	BARALIS	SmartData
PASTOR	ELIANA	BARALIS	SmartData
PIUMATTI	DAVIDE	SONZA	PEIC
PONZIO	FRANCESCO	MACII E.	POLITO
RODRIGUEZ	ESTEBAN	SONZA	RESCUE
SINI	JACOPO	VIOLANTE	POLITO
STRADA	FRANCESCO	BOTTINO	POLITO
VENTURA	FRANCESCO	CERQUITELLI	POLITO



# PAST PHD STUDENTS



- Edoardo CALIA (1992): now Deputy Managing Director at ISMB, Torino
- Letizia JACCHERI (1995): now Full Professor at the Norwegian University of Science and Technology, Trondheim, Norway
- Rakesh AGARWAL (2006): now Vice President at JPMorgan Chase & Co., Bengaluru, India
- Patricia LAGO (1997): now Full Professor at Vrije Universiteit, Amsterdam, The Netherlands
- Fabio MAINO (1998): now Distinguished Engineer at CISCO, San José, US
- Dante MALAGRINO' (2000): now Vice President Engineering at CISCO, San José, US
- Davide QUAGLIA (2002): now Assistant Professor at University of Verona
- Riccardo SCANDARIATO (2004): now Senior Lecturer at Chalmers University, Sweden
- Paolo FALCARIN (2004): now Reader at University of East London, UK
- Luis David PRIETO MARTÍNEZ (2005): now Deputy Rector at Universidad Javeriana, Bogotá, Colombia
- Andrea CAPILUPPI (2005): now Lecturer at Brunel University London, UK
- Massimiliano SCHILLACI (2007): now Senior SW Engineer at STMicroelectronics, Aosta
- Michelangelo GROSSO (2007): now Senior Engineer at STMicroelectronics, Torino
- Leticia BOLZANI (2007): now Associate Professor at PUCRS, Porto Alegre, Brazil
- Jose Alejandro OSPINA (2008): now at Deimos Space, Madrid, Spain
- Niccolò BATTEZZATI (2008): now Embedded Software Engineer at Magneti Marelli, Torino
- Alberto TONDA (2008): now Assistant Professor at INRA, France
- Carlo Alberto BOANO (2009): now Assistant Professor at the Technical University of Graz, Austria
- Fredy RUIZ (2009): now Assistant Professor at Universidad Javeriana, Bogotá, Colombia
- Alberto SCIONTI (2011): now Assistant Professor at University of Siena
- Cesare CELOZZI (2012): now Technical Leader at CISCO, San José, US
- Federico TOMASSETTI (2013): now Software Architect at Tripadvisor, Dublin, Ireland
- Hafeez UR REHMAN (2014): now Assistant Professor at the National University of Computer & Emerging Science, Pakistan
- Daniele ROLFO (2015): now at Thales Alenia Space, Torino
- Davide SABENA (2015): now at GM, Torino
- Pascal TROTTA (2016): Now Hardware Design Engineer at STMicroelectronics, Milan

# WINNERS OF ANNUAL AWARD

2017: Rosario Scatamacchia

2016: Boyang Du

2015: Tingting Hu

PHD IN COMPUTER AND CONTROL ENGINEERING

**BEST DISSERTATION AWARD**

The PhD Program in Computer and Control Engineering awards annually the Best dissertation among those of the students who take their degree in the year.

**2017 Edition**

For 2017, the winner of the award is Rosario SCATAMACCHIA for his dissertation titled "Knapsack problems with side constraints".

**2016 Edition**

For 2016, the winner of the award is Boyang DU for his dissertation titled "Fault Tolerant Embedded System Design". He DU carried out his research activities at the Dept. of Control and Computer Engineering within the **CCCE Group**.

**2015 Edition**

For 2015, the winner of the award is Tingting HU for her dissertation titled "Deterministic and Probabilistic Communication for Real-Time Embedded Systems".

Ms. Hu performed her PhD in cooperation between the Dept. of Control and Computer Engineering and the Institute of Electronics, Computer and Telecommunication Engineering (ICTE) of the Italian National Research Council (CNR). She is now a Research Fellow at ICTE.

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# PHD PROGRAM WEB SITE

<http://www.phd-dauin.polito.it/index.html>