Laurea Magistrale in Informatica
Curriculum ICT Innovation
EIT Master School - Security and Privacy
The EIT Digital Master School
General Idea

EIT = European Institute of Technology
Traditional Master Schools

- **Technology Degree → let’s call them “Blue Courses”**
  - E.g. Computer Science & Engineering
  - Some technical courses providing some breadth
  - Lots of technical courses deep diving into the main subject
  - Some “lone ranger” economic course for multi-disciplinarity → usually of inferior quality (as Technology people don’t really get management)
  - Learn to build something that surely works but may never sell

- **Business Degree → let’s call them “Green Courses”**
  - E.g. Management
  - Some business courses providing some breadth
  - Lots of business courses deep diving into the main subject
  - Some “lone ranger” technical course for the brave → usually of inferior quality (as Management people don’t really get technology)
  - Learn to sell something that may never work

- **EIT Idea? We can do better**
  - Offer a Technology Degree with a majority of blue courses and a significant size of green courses
  - At the end of the degree you should be able to understand how to make something that (a) actually works and (b) possibly sells.
Idea: LM in ICT Innovation

Year 1
1st sem.
- 24 Credits Technical Courses
- 6 Credits Innovation & Entrepr.

2nd sem.
- 12 Credits Technical Courses
- 18 Credits Business and Innovation
- EIT Summer School

Year 2
1st sem.
- 24 Credits Technical Courses
- 6 Credits Innovation & Entrepr.

2nd sem.
- Thesis & Internship (Industry or Applied Research)
EIT Digital Master School: a bit of history

- Initially a Special Programme
  - Centralized selection by KTH Sweden for admission
  - First year in Country X, then second year in Country Y
  - Fellowships only possible for people enrolled from the very beginning

- What is offered in Trento?
  - LM in Informatica
    - Data Science
    - Embedded System
    - Human-Computer Interaction
  - Security & Privacy ← this presentation
  - Software and Service Architectures
  - LM Ingegneria delle Comunicazioni
    - Digital Media
    - Internet Technologies

- From 2017-2018
  - LM Informatica → Open to *all* students
  - Centralized selection still applicable for fellowship
  - But students can also apply for the second year only
What does it mean? LM Informatica

Apply Now
EIT Degree
Entry

1st Year @ UNITN

2nd Year @ Elsewhere

Apply Now
EIT Degree
Exit

1st Year @ Elsewhere

2nd Year @ UNITN

Can’t (or
don’t want)

1st Year @ UNITN

Apply mid
1st Yr
EIT Degree

2nd Year @ Elsewhere

Or

Man, I like
UNITN

1st Year @ UNITN

2nd Year @ UNITN
What does it mean? LM Ing. Com.

Apply Now
EIT Degree
Entry

1st Year @
UNITN

2nd Year @
Elsewhere

Apply Now
EIT Degree
Exit

1st Year @
Elsewhere

2nd Year @
UNITN

Can’t (or
don’t want)

1st Year @
UNITN

Apply mid
1st Yr
EIT Degree

2nd Year @
Elsewhere
The Security and Privacy Curriculum
S&P Partner Universities

**Entry Points (= 1st year)**
- University of Twente (UT) - Twente, The Netherlands
- University of Trento (UNITN), Italy

**Exit Points (= 2nd year)**
- Eötvös Loránd University (ELTE),
- Technische Universität Darmstadt (TUD), Germany
- Saarland University - Saarbrücken, Germany
- University of Twente (UT) - Twente, The Netherlands
- University of Trento (UNITN), Italy

**More Info on the international partners is here**
- [https://masterschool.eitdigital.eu/programmes/sap/](https://masterschool.eitdigital.eu/programmes/sap/)
1st Year – Innovation & Entrepreneurship

1st sem.

- 6 Credits Innovation & Entrepr.

2nd sem.

- 9 Credits ICT Innovation
- 9 Credits Business Devel. Lab
- EIT Summer School

Fabio Massacci - EIT Master School
2016/2017
1st Year Technical Courses in S&P

1st sem
- Introduction to Security
- Security Testing
- Cryptography
- Electives (e.g., Machine Learning)

2nd sem
- Cyber Security Risk Assessment
- Network Security or other electives

Fabio Massacci - EIT Master School
2016/2017
1st Year Overview in S&P

1st Sem
- Introduction to Security
- Security Testing
- Cryptography
- Electives: Multimedia Security, Machine Learning
- Innovation and Entrepreneurship

2nd Sem
- Cyber Risk Assessment
- Network Security or other electives: Security Protocols Verification, IPR and Privacy
- Business Development Lab
- ICT Innovation

Fabio Massacci - EIT Master School 2016/2017
2nd Year Overview in S&P

1st Sem

- Offensive Technologies
- Elective: multimedia security, machine learning
- Elective: research project
- Innovation Studies

2nd Sem

- Thesis and Internship at Company of Research Center
What is in a course?

**Foundations**
- Applied Cryptography → Mathematic foundations of crypto, some labs
- Security Testing → Software technology, hands on, laboratory driven
- Cyber Risk Assessment → General risk assessment, industry case study driven
- Network Security → Intrusion detection, penetration testing, laboratory driven

**Entrepreneurship and Innovation**
- Economics and Innovation → general introduction to innovation and economic
- Business Development Lab → define concept, make business plan and pitch it
- ICT Innovation → create, budget, design and prototype your product

**Electives**
- Offensive Technologies → Hacking systems, project course
- Multimedia Security → Digital Watermarking and image forensics
- Intellectual Property and Privacy → Introduction to legal aspects
- Formal Methods for Crypto Protocol Verification → Formal theory and methods
- Machine Learning → foundations for cyber security data analytics
- Distributed Systems 2 → byzantine failures, blockchains, etc.
Who Teaches What
What Students Do?

**Students Background**
- Computer Science & Engineering → 24
- Electronics & Electrical Engineering → 5
- Mathematics → 20
- Math & Computer Science → 2
- Management & Information systems → 6

**Students Success Rate**
- After 1\(^{st}\) year in Trento – All make 60 Credits out of 60 but 1 student
- After 2\(^{nd}\) year (either Trento or partner univ.) - half graduated in September
  - Corresponding ratio of graduates for all other Degrees in DISI is 36-39%

**Students after work**
- Most work in a company
- The ones who don’t work continue with a PhD
Internships and all that

- Speakers of this session highlighted in red

- Italian Opportunities
  - ALES – United Technologies → large company in embedded systems
  - Endian → small company working on firewall appliances
  - Fondazione Bruno Kessler → research center
  - GPI → small company working on e-Health
  - Poste Italiane → large company in finance and logistics
  - Telecom Italia → large telco operator
  - More…

- Outside Italy
  - Huawei (DE) → Phone and device manufacturer
  - National Grid (UK) → UK Electricity provider
  - SAP Labs (FR/DE) → European software manufacturer
  - Securitymatter (NL) → Small company on IDS for control systems
  - More…
What is an I&E Course?

Some Examples
Sample I&E Courses

- **Business Development Lab (Aka StartUp Lab)**
  - Mandatory for all students in the ICT Innovation
  - Possible to register for other students as well (but very hard to get into)
    - [http://international.unitn.it/blt/start-up-lab](http://international.unitn.it/blt/start-up-lab)
  - What they did in
    - 2015 – [https://www.youtube.com/watch?v=gJQRBLfu1wg](https://www.youtube.com/watch?v=gJQRBLfu1wg)
    - 2016 - [https://www.youtube.com/watch?v=scUL8_Q57Nc](https://www.youtube.com/watch?v=scUL8_Q57Nc)

- **ICT Innovation**
  - Project in 2017 - Hack and take control of drones coming (illegally) into your garden or your facilities
    - [https://securitylab.disi.unitn.it/doku.php?id=ict_innovation](https://securitylab.disi.unitn.it/doku.php?id=ict_innovation)
  - Final Demo at ItalFly
    - EVOLO
    - SentinOwl
What is a Summer School?

Some Examples
Summer Schools for EIT students

- All EIT Digital Master School students during the Summer between the first and the second year are required to participate to a two-weeks summer school by EIT Digital
  - Technical lectures by experts in the field and innovation coaching to identify a product on the team
  - Best team pitches at a jury of investors/companies of the consortium

- Themes are widely diverse
  - Next slide for Summer 2017
  - Don’t know yet what happens in 2018

- For EIT Students all costs are covered by the Consortium
  - For others (Department support possible)

- Last Summer School in Trento:
  - Security & Privacy in Digital Life
  - Trento, 26/06/2016 – 08/07/2016
## Preview of 2017 Themes

<table>
<thead>
<tr>
<th>Title</th>
<th>City</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Urban Mobility, Safety and Exploration</td>
<td>Nice</td>
<td>June 25 – July 8</td>
</tr>
<tr>
<td>Citizen Participation and City Governance</td>
<td>Berlin</td>
<td>July 23 – August 5</td>
</tr>
<tr>
<td>Decentralized Production</td>
<td>Munich</td>
<td>July 30 – August 12</td>
</tr>
<tr>
<td>Retail, Markets, Consumer Engagement</td>
<td>Helsinki</td>
<td>August 6 – August 19</td>
</tr>
<tr>
<td>Healthy Lifestyle and Occupational Fitness</td>
<td>Lisbon</td>
<td>July 2 – July 15</td>
</tr>
<tr>
<td>Independent Living and Long-term Care</td>
<td>Eindhoven</td>
<td>August 6 – August 19</td>
</tr>
<tr>
<td>Cybersecurity and Privacy</td>
<td>Trento</td>
<td>July 1 – July 15</td>
</tr>
<tr>
<td>Big Data Analytics</td>
<td>Stockholm</td>
<td>August 6 – August 19</td>
</tr>
<tr>
<td>Internet of Things and Business Transformation</td>
<td>Stockholm</td>
<td>August 6 – August 19</td>
</tr>
<tr>
<td>Blockchains for Economic Security</td>
<td>Budapest</td>
<td>July 23 – August 5</td>
</tr>
</tbody>
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EIT Fellowship Deadlines
EIT Fellowships and Mobility

- **Entry and Exit Deadline**
  - Period 1b → February 15, 2017 (only deadline for Non-EU)
  - Period 2 → April 15, 2017

- **Local Recruitment at UNITN**
  - Can apply for second year fellowships for exit point
  - Opening summer 2017 → Deadline likely Nov/Dec 2017

- Just UNITN both 1st and 2nd year
  - Register at LM Informatica, choose the curriculum and be done

- **Admission requirements:**
  - Bachelor degree certificate/diploma
    - Or letter by UNITN that you will make it by the deadline
  - Final transcript of records certificates, Italian & English versions
  - CV including details on academic and professional career
  - Two letters of recommendation (from professors or employers)
  - A letter of motivation (to prove your innovative potential)
  - Proof of English proficiency (C1 everywhere, B2 depends)
More Information

- **Course information** (many courses still from 2016/17, be patient)
  - [https://securitylab.disi.unitn.it/doku.php?id=teaching_activities](https://securitylab.disi.unitn.it/doku.php?id=teaching_activities)

- **EIT Fellowships and Master School Information**
  - [http://eit-masters.disi.unitn.it/](http://eit-masters.disi.unitn.it/)

- **Contact for information**
  - EIT Master (Fellowship, Mobility, internship etc.) → Elena Bortolotti
  - Academic Tutor (Study plan, advice etc.) → Prof. Fabio Massacci
  - Mail to [eitmaster@unitn.it](mailto:eitmaster@unitn.it)