Outline

Internships
- Where to find an internship
- What to do to start an internship
- What to do once done
- Q&A

Master theses
- What we do in our labs

Meet the companies
- Short presentation of companies that offer internships/master theses

Nov. 29th, 2020
Coordination Commission for Internships

- Includes professors representing all the degrees offered by DEI, and staff of the Didactic Secretariat
  - A. Cenedese (Automation Engineering)
  - C. Fantozzi (Information/Computer Engineering)
  - Z. Sawacha (Biomedical Engineering, Bioengineering)
  - D. Vogrig (Electronic Engineering)
  - Z. Denes (Didactic Secretariat)
  - A. Zanella (MIME)

- Coordinates the activities required for the effective completion of internships by DEI students
Internships: Today’s Topics

- Definitions
- Details for Master’s Degree Courses at DEI
- What to do
  - to find an internship
  - to start your internship
  - during your internship
  - at the end of your internship
An **internship** is a period of **work orientation** and **training** that does **not** take the form of an **employment relationship**

**Involved subjects:**

- Intern → you
- Host institution → company tutor
- Proposing institution → university tutor
The **host institution** can be

- **the University of Padova**
  - Any research lab of UniPD

- **another organization (national or international)**
  - Companies
  - Research centers
  - Universities (other than UniPD)
Internship: Types

- **Curricular**: Included in a formal learning process (leading to a degree)
  - Carried out by students

- **Extracurricular**: Carried out by fresh graduates
Training activity that awards 9 ECTS credits (CFUs), registered (without a mark) in the student's career.

Mandatory for all ICT for Internet & Multimedia curricula (except for "International Mobility")
A working student can have a job activity recognized as an internship if
- the activity is compatible with the learning objectives of the Master’s degree, and
- it is approved by a professor

→ Same duration and credits of any other internship
→ Fill out the form «Svolgimento del tirocinio nell’ambito di attività lavorative», which can be downloaded from Bacheche DEI, and deliver it to the DEI’s Student Affairs Office before the activity begins
Internships & Thesis Separated or Combined?

**Internship**
- **9 CREDITS**
- **250 HOURS**
- 2 months
- • acquire on-field experience studying and/or working on real-world problems
- • Get the **Internship certificate**

**Final (thesis) project**
- **21 CREDITS**
- **~530 HOURS**
- 4-6 months
- • original research activity, development of new concept/solutions
- • write a detailed report about it
Contact one or more professors to learn about their research activities

http://mime.dei.unipd.it/course-description/professors
What to do: Finding an Internship

External internships: find a company

- Check the offers in MIME website: http://mime.dei.unipd.it/opportunities/internships

- Check the offers in the University portal managed by the Career Service Office.
  Internships in Italy: https://www.unipd.it/cercare-stage-italia
  Internships abroad: https://www.unipd.it/cercare-stage-allestero

- Contact a company by your own

Always involve a professor for final approval
Required documents

Host Institutions

- Must have signed the **TRAINING AGREEMENT** ("Convenzione", signed by the host institution) with UNIPD
  - All companies in our websites have already signed the agreement
  - New companies:
    - Contact internship responsible
    - Fill out online form: [https://www.unipd.it/attivare-stage-e-tirocini](https://www.unipd.it/attivare-stage-e-tirocini), section «Attivare uno stage con studenti»
Required documents

Student

☑ BASIC COURSE IN HEALTH AND SAFETY: GENERAL TRAINING
("Corso di formazione generale sulla sicurezza", 4 hours)

Every student must pass this online course before her/his internship begins

Student

- EDUCATIONAL PLAN ("Progetto formativo")

- To be provided **by the student** through this webpage:

  https://careers.unipd.it/en/
Details to be provided in the educational plan:

- start/end date, location, work hours, ...
- credits/duration:
  - Internship only: 9 ECTS credits, (2 months)
  - Internship+final project: 30 ECTS credits (6 months)
- Short description of the planned activities and objectives
- Benefits offered to the intern, TAX/VAT number of the hosting institution, convention number
- company tutor, university tutor
Starting Your Internship

Step by step

1. **fill out the online educational plan form** (as described before)

1. **print** the plan and **get it signed** by the university tutor and yourself

1. **deliver the plan to the Career Service Office at least 15 days before the internship begins**
Stroll to the **Career Service Office**...
During Your Internship

Do your work & keep tutors updated

- The intern carries out the activities specified in the educational plan, consulting with the tutors as appropriate.

- The intern reports her/his progress, and chiefly issues in the management of the internship, to the university tutor.

- All changes (extensions, early interruptions, activities not taking place in the location specified by the plan, etc.) during the internship must be communicated by the hosting institution to the Career Service Office and to the university tutor by sending email(s) to stage@unipd.it and to internship.mime@dei.unipd.it.
At the End of Your Internship

What to do

1. download the «Internship certificate» ("Attestazione di tirocinio") form and print it:
   https://www.dropbox.com/s/ubdks7upm2z7d3f/AttestatoFine%20Tirocinio.doc?dl=0
   1. make the company tutor fill it in and sign it
   2. bring the paper to the Career Service Office for validation
   4. brings a copy of the validated document to the DEI’s Student Affairs Office, which starts the registration process and... you are done!

→ For internships abroad: Contact the Career Service Office
Within the framework of the Erasmus+ programme, the University of Padova provides mobility scholarships for students who want to carry out an internship in a European Union country.

→ [https://www.unipd.it/en/erasmus-traineeship-mobility](https://www.unipd.it/en/erasmus-traineeship-mobility)

There are other tenders for mobility grants abroad: some of them are listed on the University website or on Bacheche DEI.

→ [https://www.unipd.it/cercare-stage-allestero](https://www.unipd.it/cercare-stage-allestero)
Recommendations

When should I do it?

- I’m done with all my exams! I just need to do internship and thesis!
- I’ve followed all my courses, and left only 1 or 2 exams to pass
- I still have to follow a 1 or 2 courses and pass 2 or 3 exams
- I still have to follow 3 or more courses, but I wish to do the internship and thesis before finishing the exams…
Recommendations

When should I start looking around?

**Internal:**
- ask your professors when you are almost done with the exams

**External:**
- Start looking for available hosting institutions about 2 months before the planned starting date

**Abroad:**
- Start looking for available hosting institutions about 6 months before the planned starting date
Warnings

This presentation provides only the essential information

- Read the **guidelines** available on Bacheche DEI
  → [https://elearning.dei.unipd.it/stage](https://elearning.dei.unipd.it/stage)

- The website is currently in Italian. English version is on its way, but may take some time...

- In case of need, refer to **Dr. Zoltan Denes** of the **DEI’s Student Affairs office** ("Segreteria Didattica") – phone 049 827 7624
Start your thesis work


- The website is currently in Italian. English version is on its way, but may take some time...

- In case of need, refer to Ms. PELLIZZARO ROBERTA of the DEI’s Student Affairs office (“Segreteria Didattica”) – phone 0498277690
Contacts

- **For MIME internship/thesis:**
  - Proposals: [http://mime.dei.unipd.it/life-mime](http://mime.dei.unipd.it/life-mime)
  - Info: internship.mime@dei.unipd.it

- **Paperwork and bureaucracy**
  - DEI’s Student Affairs office (“Segreteria Didattica”) ➔ DEI/A (2nd floor)
    - **Internship:** Zoltan Denes – phone 049 827 7624 [stage@dei.unipd.it](mailto:stage@dei.unipd.it)
    - **Thesis:** Roberta Pellizzaro – phone 049 827 7690

- **Other issues:**
  - Career Service Office ➔ Palazzo Storione (20’ walk)
    - [https://www.unipd.it/stage](https://www.unipd.it/stage)
    - stage@unipd.it – tel. 049 827 3075
M.I.M.E Research Areas
The following slides are far from being complete!

They just collect **some** of the most recent **research activities** carried out by the MIME’s professors and their research groups

To know more, please, **visit the websites** indicated at the bottom of the slides and/or **contact the professors**
Machine-Learning based Wireless Network Optimization

Time Series Predictive Modelling
Estimate future parameters based on past event as well as important factors

Probabilistic Forecasting
Modelling user behaviour as a probabilistic process to predict future user behaviour

Hierarchical reinforcement Learning
Analyse user requirements and feedback and train models based on the requirements

Contact: Prof. A. Zanella (zanella@dei.unipd.it)
Environmental sensing through radio waves

Signal processing, deep learning and reinforcement learning algorithms for sensorless sensing through radar, WiFi routers and SDR.

Sensor fusion techniques to integrate camera information in monitoring systems and dataset creation.

Contact: Prof. M. Rossi (rossi@dei.unipd.it)

Neuro-inspired Multi-stage Processing in MEC Networks

Service-based network areas specialization

Learning how to efficiently offer process. services.

Tools: ILP, dynamic programming, and low-complexity heuristic solutions.
Wireless for everything

- Wireless networks are at the basis of what we do, daily.
- In a few years, everything will be connected, with people, things, vehicles and robots seamlessly interacting over future networks.

Multiple thesis and internship topics are available on

- **Future Wireless Nets**
  - **5G**: mmWave networks
  - **6G**: exploring the terahertz band, non-terrestrial networks with drones and satellites

- **Connecting Everything**
  - **IoT**: develop solutions to connect billion of devices
  - **Vehicular networks**: autonomous car networks and integration with sensors (Lidar, etc)

- **Underwater Networks**
  - multimodal networks: combine the benefit of different wireless interfaces for communications in such challenging environment

Contact: Prof. Michele Zorzi - zorzi@dei.unipd.it

Complex networks

Local similarities in complex networks

Investigate efficient methods to classify nodes according to their local network structure. Apply it to citation and social networks, to identify roles and gender gaps.

Communities and interdependencies

Use local PageRank to unveil (directional) interdependencies and links centrality, and to build a (hierarchical) structure that identifies communities. Apply it to real-world scenarios.

Contact: tomaso.erseghe@unipd.it

In collaboration with the Dept. of Psychology
Satellite Navigation and Security

Satellite navigation
Secure positioning
Navigation cyber response
Enhanced navigation in space

Wireless security
Physical layer security
Adversarial machine learning
5G security

Contacts: dr. N. Laurenti (laurenti@dei.unipd.it), prof. S. Tomasin
Webpage: http://gnss.dei.unipd.it
Innovative Scheduling Algorithms
Support differentiated services
Scheduling based on machine learning
Provide scheduling for network slicing in 5G networks
In cooperation with:

Erasmus – Darmstadt, Germany
(new Erasmus opportunity)
Beamforming for 5G mmWave systems for antenna arrays based on liquid crystals
AI-based predictive beamforming

Contacts: prof. S. Tomasin (tomasin@dei.unipd.it)
Spatial division multiplexing\textsuperscript{2-4}

New fibers, multimode and multicore, to increase data rate per single fiber. Experimental characterization, modeling, nonlinear optical amplifiers.

Fiber optics sensors\textsuperscript{2,3}

Developing sensors based on optical fibers, in particular distributed ones (sensing over the entire fiber length). Sensing: temperature, vibrations, humidity, electric current, magnetic field, acoustic waves, pressure and more ...

Nanophotonics devices\textsuperscript{1,4}

Modeling photonic devices exploiting innovative, nanostructured materials and devices like photonic crystals, metamaterials, nanoplasmonics, nanoantennas and graphene.

Contact: Proffs. D. De Ceglia\textsuperscript{1}, A. Galtarossa\textsuperscript{2}, L. Palmieri\textsuperscript{3}, M. Santagiustina\textsuperscript{4}

webpage: http://peg.dei.unipd.it/index.php?section=75
Antennas

Design of smart antennas$^{1-3}$
Smart antennas for reconfigurable beamforming with applications in fixed and mobile communications including 5G.

Plasma antennas$^1$
Design and prototyping of innovative plasma-based antenna arrays for satellite navigation systems and for 5G Urban Bands Cell On Wheels.

Innovative antennas for melanoma detection$^1$
Modeling and design of innovative millimeter-waves probe antennas for early-stage skin cancer detection.

Contact: Proffs. A.D. Capobianco$^1$, A. Galtarossa$^2$, M. Santagiustina$^3$
Deep learning for AR and Multimedia Analysis

Deepfake creation and detection from multimedia signals (audio, images, videos)

Investigate the creation of artificial audios, images, and videos with GANs (Generative Adversarial Networks). Design solution for their detection.

Signal analysis (audio, images, streams) for forensic applications

Audio and image quality enhancement. Image localization and scene or event reconstruction. Packet stream analysis for video classification.

Deep learning strategies for Augmented Reality


Contact: prof. Simone Milani (simone.milani@dei.unipd.it)

Internships available!
Deep Learning for Semantic Segmentation

Semantic segmentation of images with deep learning

Focus on unsupervised domain adaptation and incremental learning

3D Data acquisition with ToF sensors

Acquisition of depth data with Time-of-Flight sensors and stereo vision

Deep Learning techniques for depth data refinement and fusion of information from multiple sensors

Classification of 3D representations

Classification of 3D objects with deep learning

Hand gesture recognition from 3D data

Contact: Prof. P. Zanuttigh

Have a look at [https://lttm.dei.unipd.it](https://lttm.dei.unipd.it)