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MIME Master's degree ICT
Internet Multimedia Engineering

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

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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

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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

Internship: Definitions

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

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Internship: About Host Institutions

- 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)

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Internship: Types

CURRICULAR

Included in a formal learning process (leading to a degree)

Carried out by **students**

EXTRACURRICULAR

Carried out by **fresh graduates**

Curricular Internships

CURRICULAR INTERNSHIPS → **FOR STUDENTS**

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")

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Curricular Internships

Turn your job into an internship

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

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Internships & Thesis
Separated or Combined?

Internship

9
CREDITS

250 HOURS

2 months

≠

Final (thesis) project

21
CREDITS

~530 HOURS

4-6 months

- acquire on-field experience studying and/or working on real-world problems
- Get the **Internship certificate**

- original research activity, development of new concept/solutions
- **write a detailed report about it**

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What to do:
Finding an Internship

Internal internships

- **Contact one or more professors** to learn about their research activities

http://mime.dei.unipd.it/course-description/professors

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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

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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, section «Attivare uno stage con studenti»

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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

https://elearning.unipd.it/formazione/course/index.php?categoryid=39

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Starting Your Internship

Student

- **EDUCATIONAL PLAN** ("Progetto formativo")

- To be provided by the student through this webpage:

https://careers.unipd.it/en/

Starting Your Internship

Educational Plan

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

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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**

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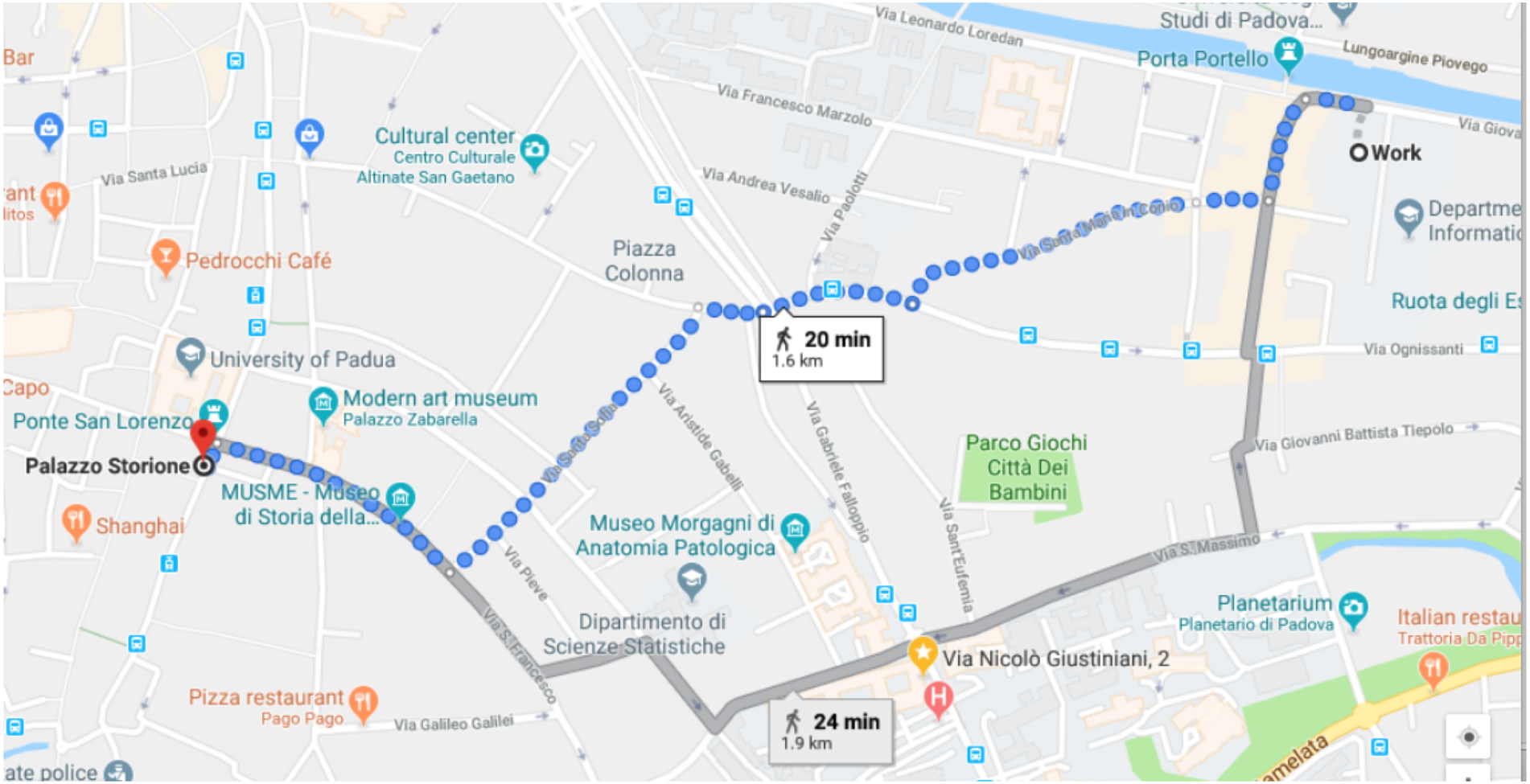
Starting Your Internship

Stroll to the **Career Service Office**...



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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

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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

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Internships abroad

Scholarships

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

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/en/internships-and-job-placement

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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

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Warnings

This presentation provides only the essential information

- Read the **guidelines** available on Bacheche DEI
  → 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

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Start your thesis work

- Check instructions on:
  https://elearning.dei.unipd.it/mod/book/view.php?id=3&chapterid=31

- 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

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Contacts

- **For MIME internship/thesis:**
  - Proposals: **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)**

  https://elearning.dei.unipd.it/mod/book/view.php?id=3&chapterid=47
    - **Internship:** Zoltan Denes – phone 049 827 7624 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

    stage@unipd.it – tel. 049 827 3075

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UNIVERSITÀ
DEGLI STUDI
DI PADOVA

M.I.M.E Research Areas

Note

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**

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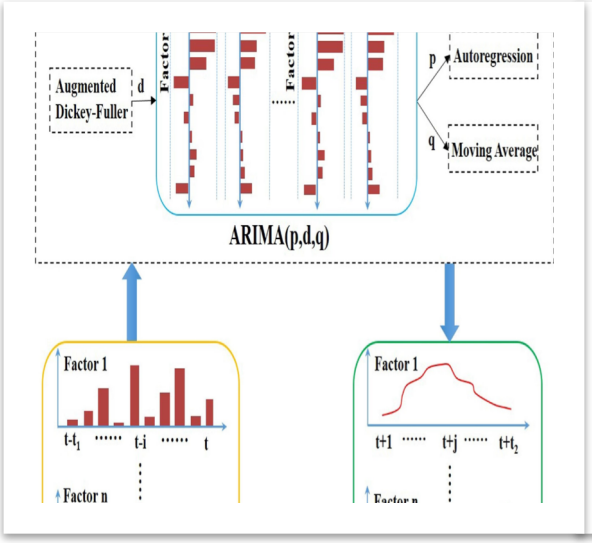
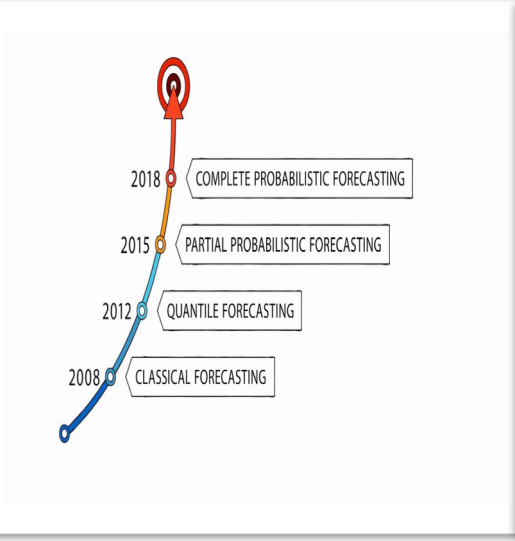
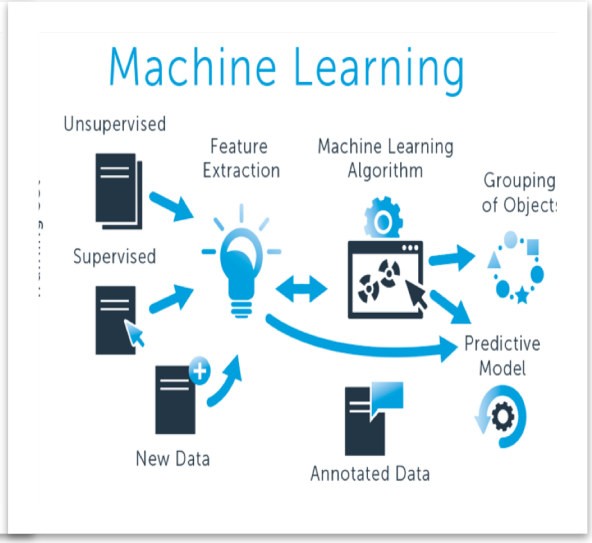
Machine-Learning based Wireless Network Optimization







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)

Read the list at http://bit.ly/Zanella-Theses

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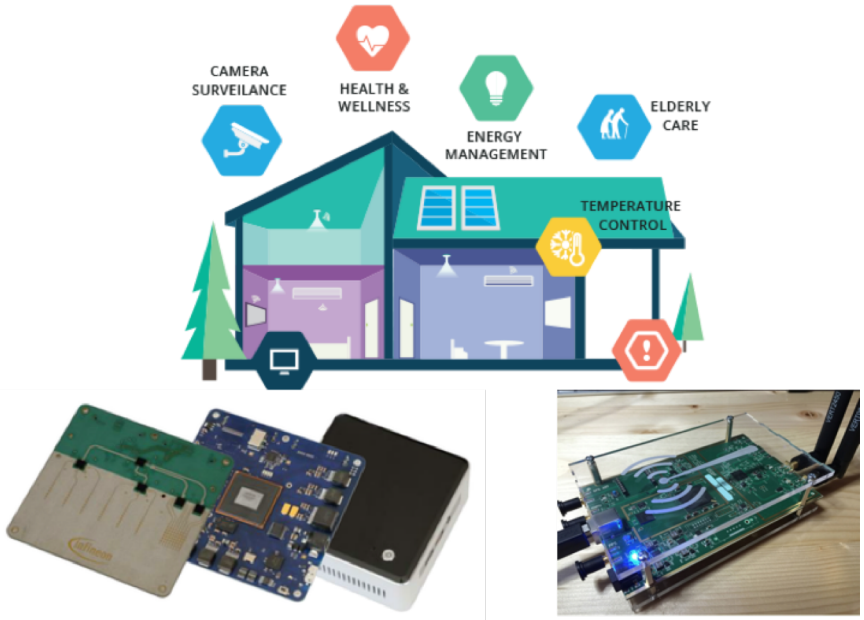
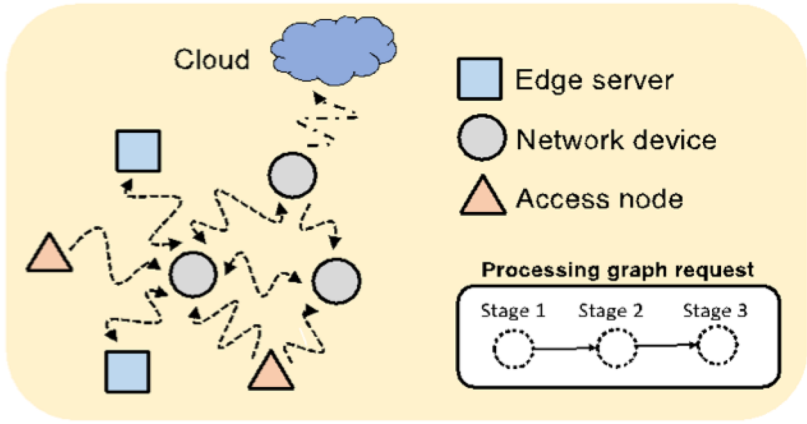
Radio waves sensing MEC networks



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.



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.

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

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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

Read the list at **http://bit.ly/zorzi-theses**

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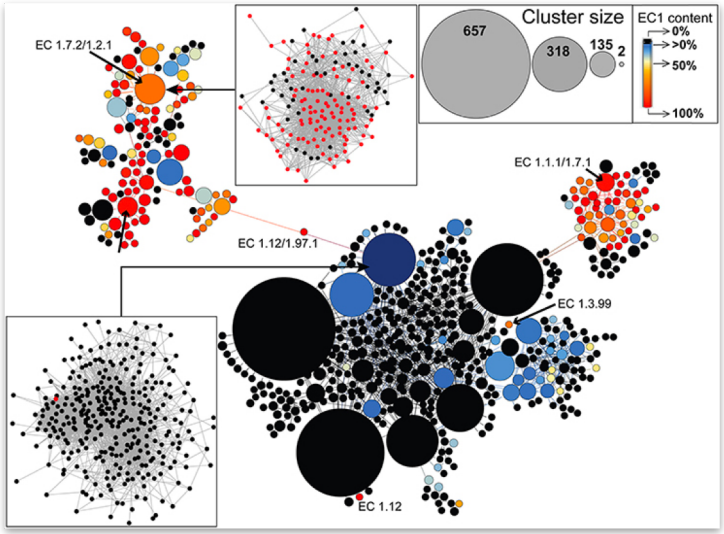
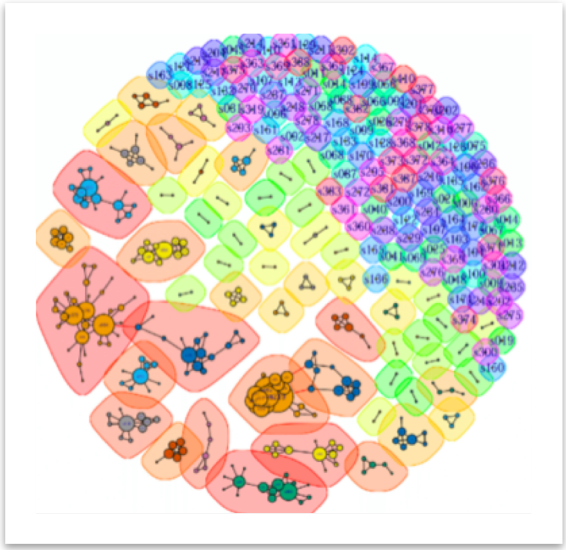
Complex networks





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

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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

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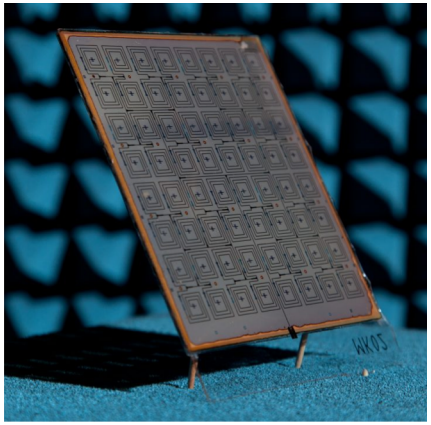
5G Networks



Erasmus – Darmstadt, Germany

(new Erasmus opportunity)

Beamforming for 5G mmWave systems for **antenna arrays based on liquid crystals**

AI-based predictive beamforming

Innovative Scheduling Algorithms

Support differentiated services

Scheduling based on machine learning

Provide scheduling for **network slicing** in 5G networks

In cooperation with:

FONDAZIONE BRUNO KESSLER

FUTURE BUILT ON KNOWLEDGE

thematic PhD scholarship for students graduating by September 2020

Contacts: prof. S. Tomasin (tomasin@dei.unipd.it)

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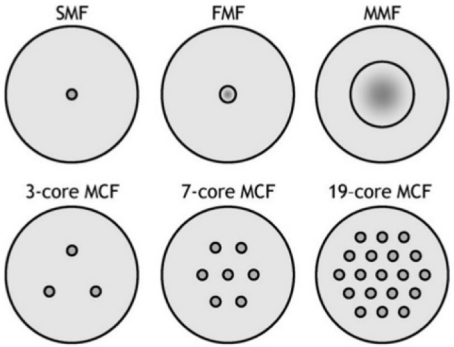
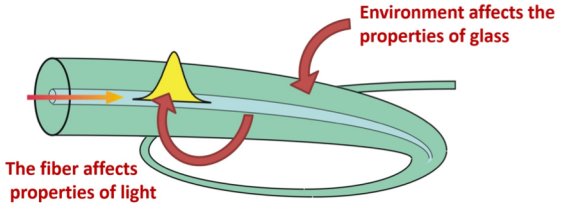
Photonics



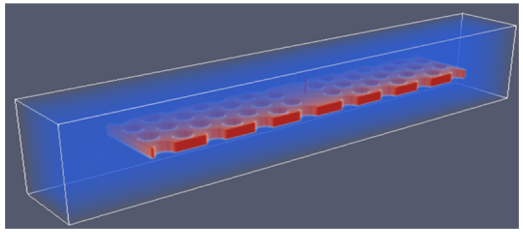
Spatial division multiplexing[2-4]

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



Fiber optics sensors[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[1,4]

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

Contact: Proffs. D. De Ceglia[1], A. Galtarossa[2], L. Palmieri[3], M. Santagiustina[4]

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

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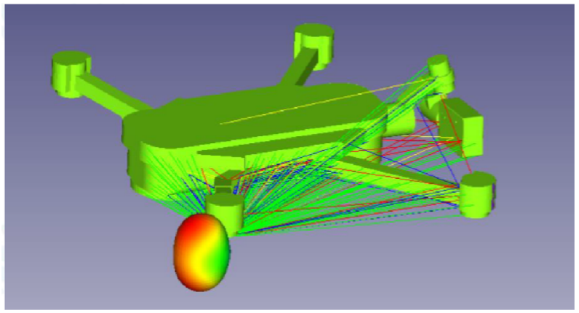
Antennas

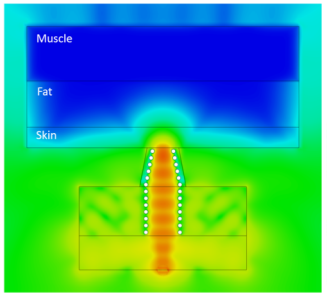


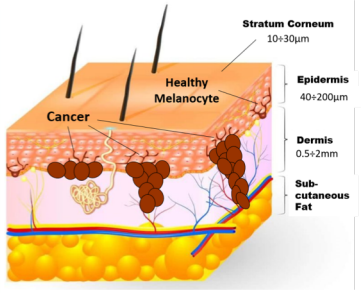
Design of smart antennas[1-3]

Smart antennas for reconfigurable beamforming with applications in fixed and mobile communications including 5G.

Plasma antennas[1]

Design and protoyping 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 millimiter-waves probe antennas for early-stage skin cancer detection.

Contact: Proffs. A.D. Capobianco[1], A. Galtarossa[2], M. Santagiustina[3]

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

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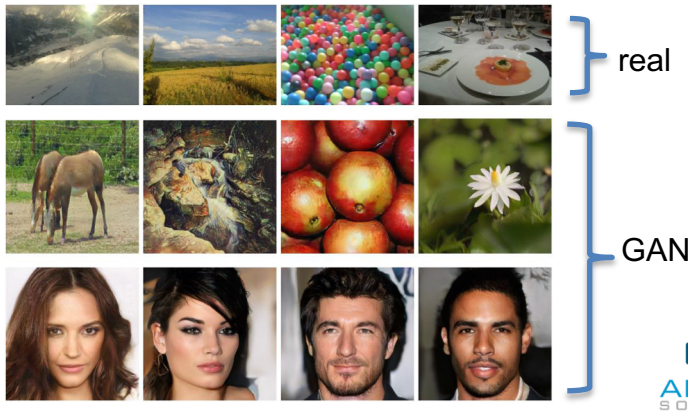
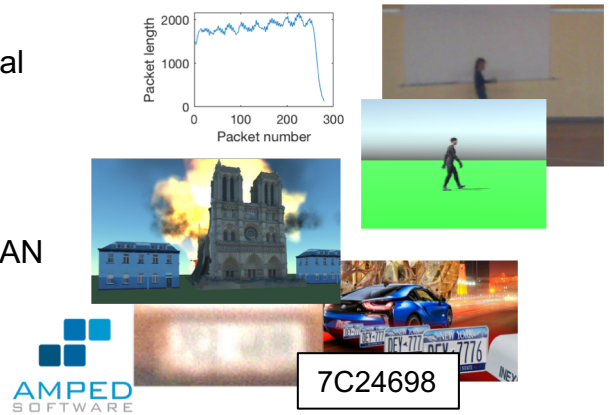
Deep learning for AR and Multimedia Analysis





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

Deep learning solutions for 3D model compression, reinforcement learning for Quality-of-Experience, Human computer Interaction

Internships available !

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

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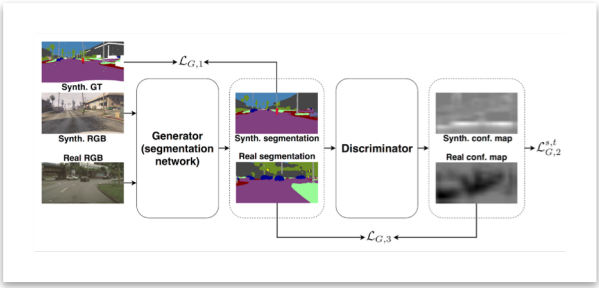
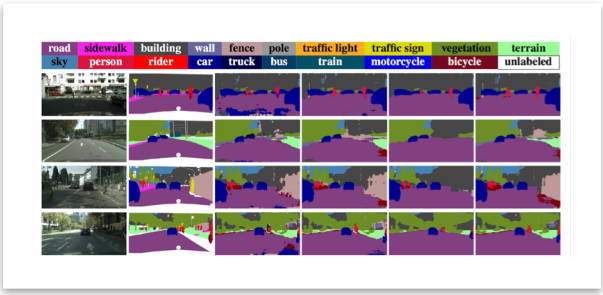
Computer Vision and Machine Learning





Deep Learning for Semantic Segmentation

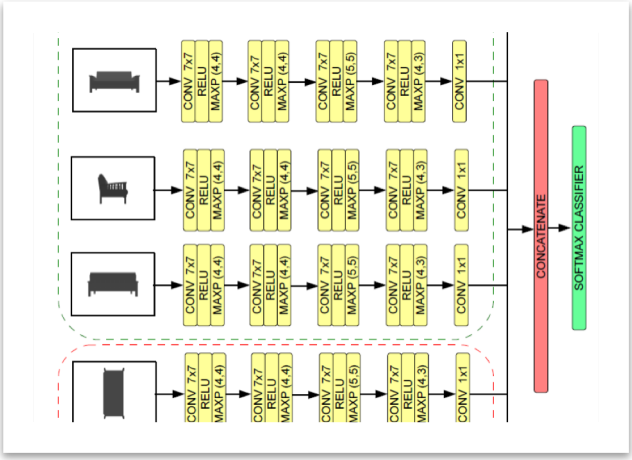
Semantic segmentation of images with deep learning

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