Shkodër, Albania

DAAD 2023
Workshop
The impact of pandemic years to informatics education: review and next steps

Crossing borders: Summer School in Systems Engineering with Robotic integration- a step towards Internationalization

Prof. Dr. Elinda Kajo Meçe

Faculty of Information Technology
Polytechnic University of Tirana
Tirana, Albania

COOPERATION and INTERNATIONALISATION

UPT is an open institution towards knowledge, innovation and cooperation with partnering counterparts in Europe and around the world.

One of the strategic priorities is sustainable development through long-lasting cooperation with similar institutions in Europe, but not only.

UPT has active cooperation agreements with **72 partner universities** in Italy, France, Germany, Spain, Greece, Sweden, Finland, Romania, Belgium, Netherlands, Croatia, Poland, Bulgaria, Turkey, Kosovo, UK, Japan, USA, Ukraine, etc.

ERASMUS+ KA1 PROJECTS

In the frame of inter-institutional agreements, the PUT has entered agreements of mutual interest with **55 partner universities**, mainly European ones.

Starting from 2020 to the present, there have been 196 mobilities of outgoing students, 58 incoming students and 122 mobilities of staff outgoing, 67 incoming.

FACULTY OF INFORMATION TECHNOLOGY

DIPLOMAS:
BACHELOR
Electronic Engineering
Computer Engineering
Telecommunication Engineering

MASTER OF SCIENCE:
Electronic Engineering
Computer Engineering
Telecommunication Engineering
Artificial Intelligence and Optimization

PROFESIONAL MASTER:
Software Engineering
Information Technology

PHD STUDIES

DEPARTMENTS:
Department of Electronics and Telecommunications
Department of Computer Engineering
Department of Fondamentals Informatic

Internationalization in FTI -UPT

- Invited professors to teach courses in the master study program.

- Encourage our faculty to participate in teaching and research exchanges abroad.

- Students Mobility -Preparing students for a globalized world.

- Simplify credit transfer, making it easier for students to study abroad.

- Collaborate with partner universities to align curricula and standards.

- Establish double diploma programs with partner universities, enabling students to graduate with degrees from both institutions.

- Participation in EU Projects: Actively engage in research and educational projects.

- Promote cross-border collaboration and access to resources.

Double Degree Agreements

Polytechnic University of Tirana - UPT was founded in 1951

Compiègne University of Technology - UTC was founded in 1972

University of Genova –UNIGE was founded in 1481.

Implementation of the double degree in Master Studies with UTC and UNIGE in Computer Engineering and Electronics Engineering.

Three years experience (2020-2023): 3 Professors from UTC, 6 Professors from UNIGE, 5 courses in the first year of master's studies. 10 students in UTC, and 10 students in UNGE in the second year of studies.

For the next year are selected 6 students in UTC, and 5 students in UNGE

First Albanian-Italian Summer School in Systems Engineering

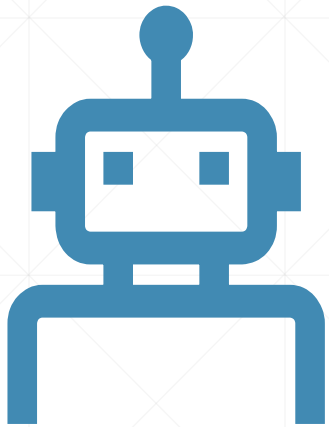| Why? |
|---|
| -to introduce Bachelor students enrolled in the Computer Engineering and Electronic Engineering courses at UPT to systems engineering by some lectures and a hackathon given in collaboration with University of Genova, Italy.
-to introduce these students to the Double Degree path in collaboration with Laurea Magistrale in Computer Engineering at University of Genova, Italy, which allows students enrolled in the Master Degrees in Computer Engineering and Electronic Engineering at UPT to get both the Albanian and Italian degrees. |

Where?	Who?	When?
FTI -UPT	3rd year Bachelor students from the Computer Engineering and Electronic Engineering	June 6th to 9th

Summer School Program

Opportunity to …

… learn basics of Control System

… learn Matlab/Simulink software

… apply theories to physical system

… and have a bit of fun

Other related Hackathon

Summer School is customized for complex systems

Focused on the PID control system

Understanding how a control model interacts with the object, before turning it into an algorithm or programming code.

The scheme of the system and control model is built in Simulink and in a parametric way we change the PID coefficients in order to control the motors at different speeds.

Winter School Annecy (FR) 2021

Summer School Imperia (IT) 2022

Winter School Annecy (FR) 2022

First day

Three lectures + Introduction to the Hackathon

- Introduction to Systems Engineering – lecture by Professor Roberto Sacile , University of Genova
- Examples of Systems Engineering Approaches – UNIGE, UPT PhD students
- The double degree between UPT and UNIGE and related PhD paths –UNIGE, UPT Professors and PhD students
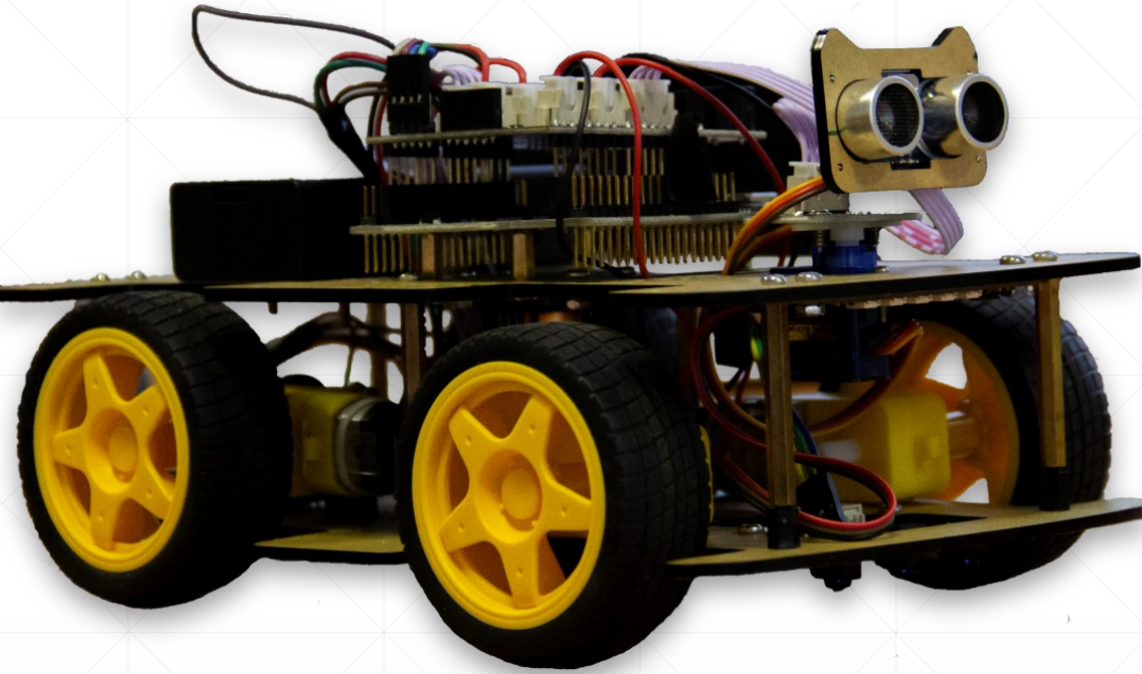
Second day

Three lectures + Programming the wheeled robots for the competition

- Future of brain-computer interfaces in control applications– Lecture by Professor Enrico Zero, University of Genova
- Introduction to MATLAB and Simulink– UNIGE, UPT PhD students
- Introduction to Microcontrollers– Lecture by Professor Marco Raggio, University of Genova

Third day: Races
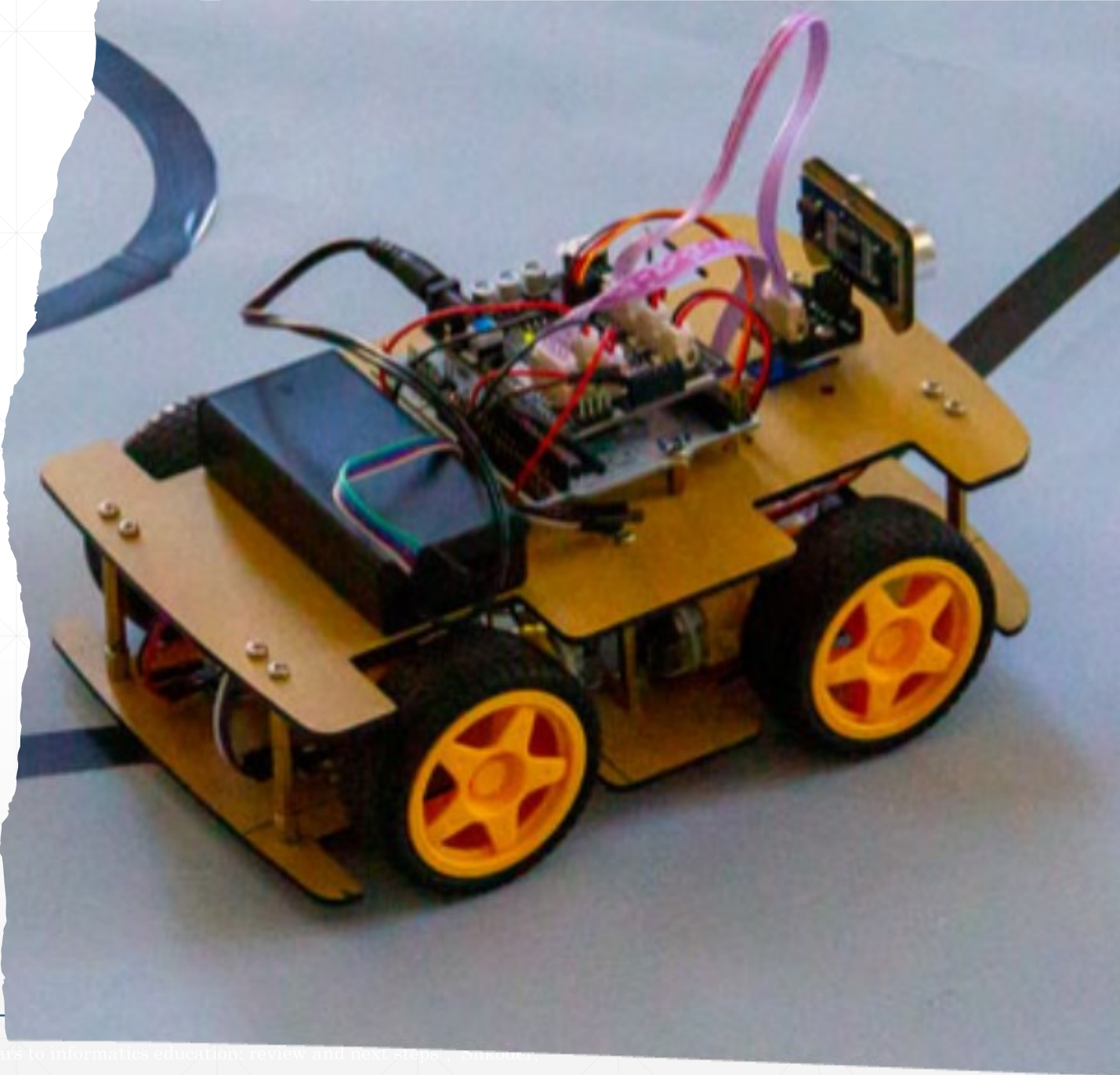
Minicar

It is a FREENOVE 4WD Carkit

Can be classified as a Wheeled Mobile Robot (WMR)

Dimensions: 25x15cm

- **4 non-steering motorized wheels** (DC, 5V each): they allow the WMR to rotate on itself

- **Ultrasonic sensor**: it emits ultrasounds that bounce off possible obstacles or surfaces and return to the receiving sender. The time of sending and returning the wave is used to calculate the distance from it.

- **Line sensor with 3 photodiodes**: they detect the color difference on black and white surfaces

- **Car shield**: manages the distribution of current and voltage to the various components, and the exchange of information

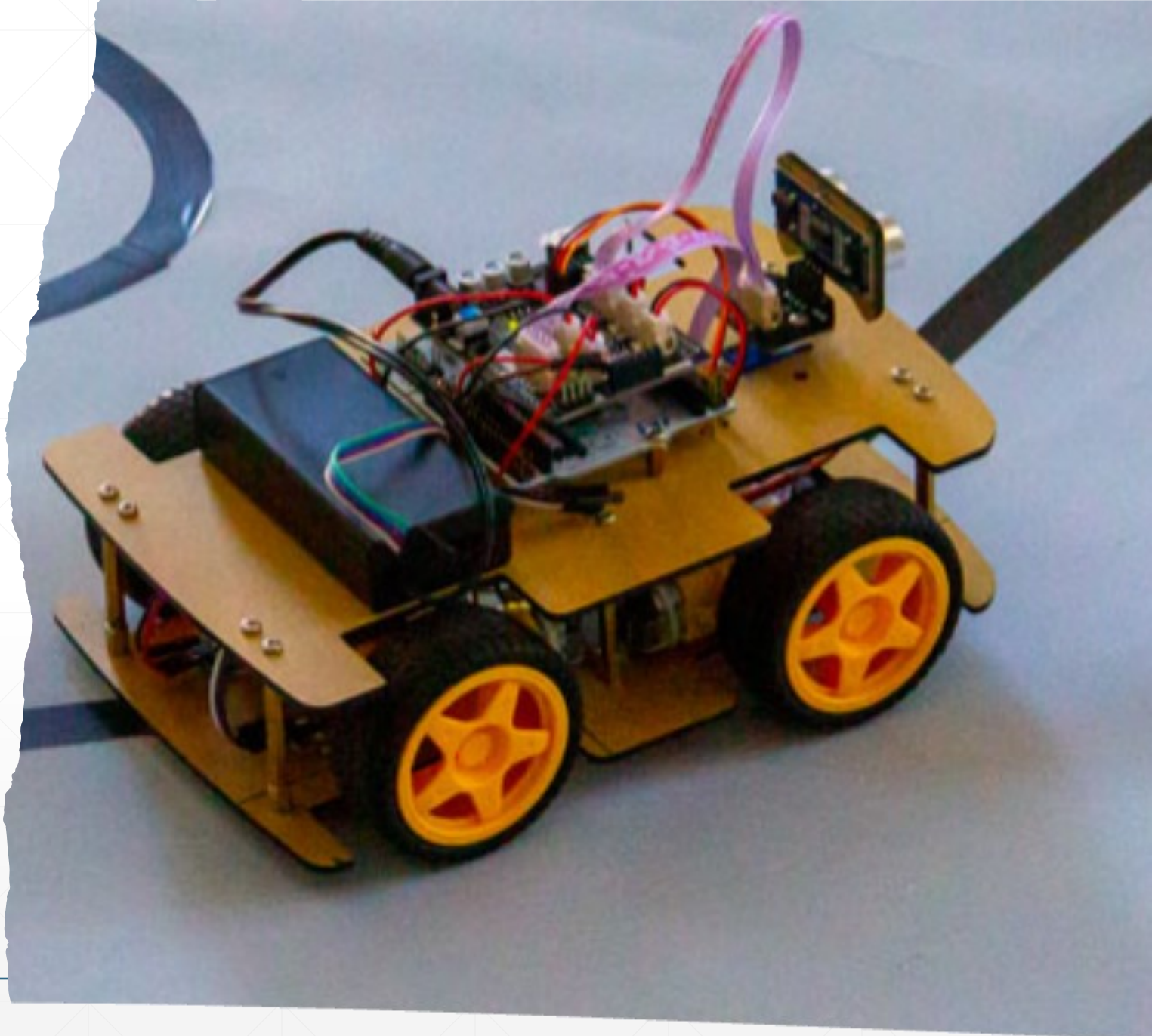- **Control board**: it elaborates the information retrieved by sensors

Race 1: Line Follower

- Goal - Follow a line as fast as possible

- How it works
  - It's timed
  - Three laps
  - Time penalty if the minicar goes out of the path (+5 seconds)
  - Two tries
  - The best performance out of two tries is the score
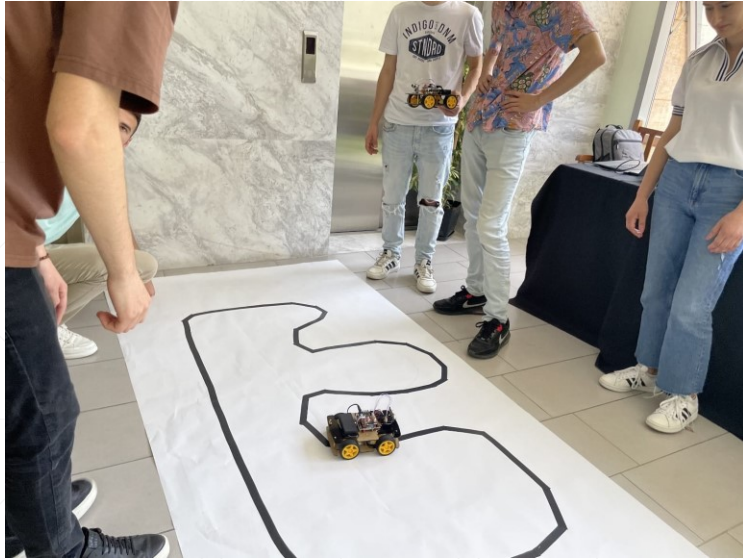
Race 2: Distance Keeping

- Goal - Stop the minicar at a specific distance from an obstacle

- How it works

  - Random starting distance

  - Stop the minicar at 20 cm from an obstacle

  - Error from the reference is the score

  - Two tries

Measuring performance

DAAD Workshop "The impact of pandemic years to informatics education: review and next steps", Shkoder, Albania, 4th – 8th September 2023

Benefits – students' perspective

1. **Diverse Learning Experience**: Students got the opportunity to learn from a wider range of instructors, benefited from different teaching styles, and accessed diverse perspectives and expertise from both universities.

2. **Networking Opportunities**: Students built a larger network of peers and professionals from both universities, enhancing their future academic and career opportunities.

3. **Interdisciplinary Learning**: Joint summer school encouraged interdisciplinary collaboration, allowing students to explore connections between different fields and develop a more holistic understanding of complex issues.

4. **Skill Development**: Students acquired new skills and competencies, both academic and practical.

Benefits – academics' perspective

1. **Research Collaboration**: Faculty members from both universities can collaborate on joint research projects, leveraging each other's expertise and resources.

2. **Expanded Course Offerings**: Collaboration allows for the creation of unique courses or workshops that draw on the strengths of both institutions, providing students with a broader range of subjects and topics to choose from.

3. **Resource Sharing**: Both universities shared facilities, resources, and materials, leading to cost savings and improved utilization of existing assets.

4. **Enhanced Reputation**: The collaborative summer school enhanced the reputation of both universities by showcasing their commitment to quality education and innovation.

5. **Long-Term Partnerships**: Joint summer school can lay the foundation for broader and deeper partnerships between the two universities, potentially leading to future collaborations in research, faculty exchange, and more.

THANK YOU!

QUESTIONS?