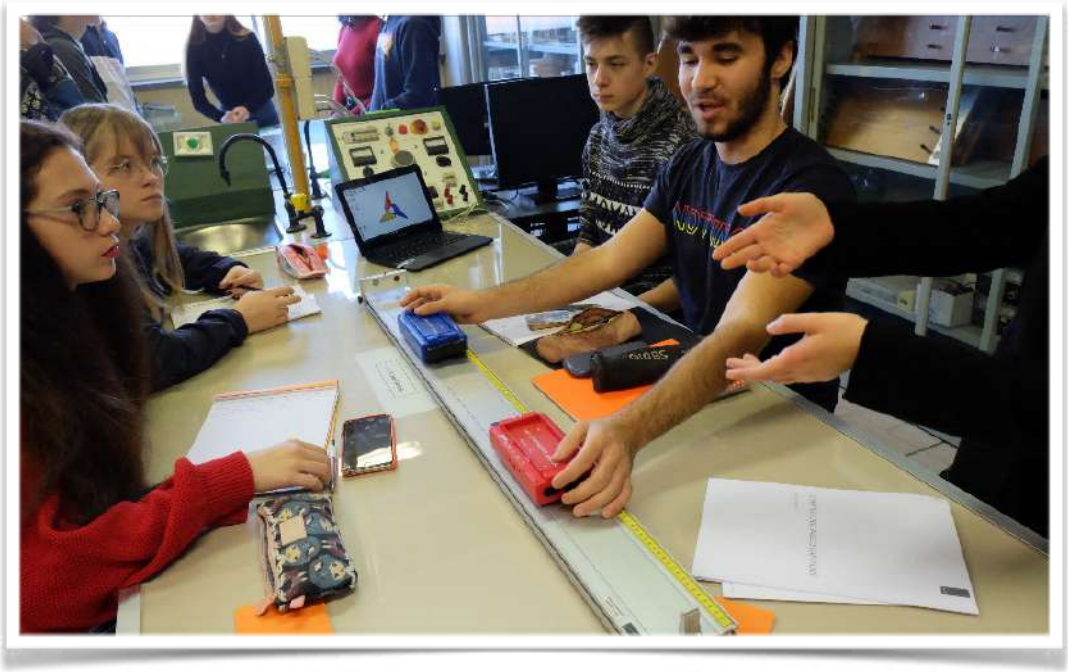
10.12.2019 13.12.2019

Diary Padova

Erasmus+ Eupantec2019 Meeting



Physics and New Technologies

Ultrasonic motion detector (Pasco) - used for object detection

website: eupantec2019.eu

Tuesday, 10.12.

Morning

After a warm welcome to Istituto Istruzione Superiore Pietro Scalcerle by headmaster Giancarlo Pretto we were introduced to some experiments prepared by the Italian team. Pressure, temperature and motion date retrieved by PASCO sensors were displayed and analysed by use of the CAPSTONE software. Eventually we carried out a competition between different teams to match given graphs by creating motion data.

1

MOTION

Main topic of the meeting

2

EQUIPMENT

Sensors and interfaces from Pasco, Vernier, Texas instruments. Arduino and sensors. Robot based on Arduino, smartphones.

3

METHOD

work in mixed groups (1 student from each country)

4

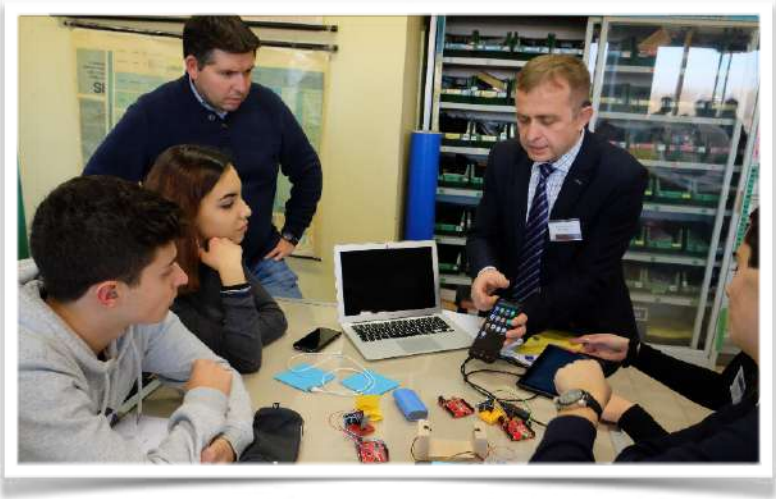
SOFTWARE

Capstone, Vernier Graphical Analysis, Mobile Applications: PhyPhox, RemoteXY, Arduino IDE.

Experiments about motion with PASCO motion sensor including creation of graphs and competition

Tuesday afternoon:

In internationally mixed teams the students from Italy, France, Germany, Poland and Portugal took part in various experiments prepared by the visiting teams, including working with ARDUINO, Phyphox and programming robots.



„ Wednesday, 11.12.

Our students took part in different workshops provided by the participating countries. The groups were changed from the day before.„

We also payed a visit to the renaissance age Palazzo Bo, first home to Padova University, and the world famous Anatomic Theatre.

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Wednesday afternoon:

The teams concentrated on video analysis using CAPSTONE software. Footage of a ball being shot from a moving carriage was displayed and evaluated.

DE

PHYPHOX MOBILE APPLICATION

PL

VERNIER GODIRECT SENSORS+GRAPHICAL ANALISYS

Arduino IDE+RemoteXY mobile application+ sensors

FR

Arduino IDE+DFrobot plaform based on Arduino- Romeo board

PT

TEXAS INSTRUMENTS SENSORS

Thursday, 12.12

The student teams were allotted to new workshops. Thus everybody had the chance to experience all the materials prepared.

THURSDAY AFTERNOON:

After a day of extensive experimenting students and teachers enjoyed a guided tour through Museo di Storio della Fisica (Padova Museum of History of Physics) which hosts exhibits from all around Europe. Thus the visit matched the spirit of EUPANTEC to create a European network of knowledge among students.

Diary Padova

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Friday, 13.12.

We were happy to spend this cold, snowy winter morning inside the Museo la Specola (Museum of the History of Astronomy). Led by guides we admired historic telescopes and other stargazing equipment; and eventually enjoyed the view from the ancient Torre di Galileo onto the white roofs of Padova.

COMPLETE LIST OF CONDUCTED EXPERIMENTS

Poland

1)Examples of the use of Arduino in physical experiments to measure motion.

- Ultrasonic distance sensor (HC-SR04), ADXL-335 accelerometer, beam break sensor for motion testing (e.g. determination of the pendulum period, harmonic motion testing), using Arduino, but also with smartphone with RemoteXY app through OTG or bluetooth connection
- Examples conducted with Vernier GoDirect wireless sensors:
- 2) pendulum period
- 3) simple harmonic motion- mass on the spring

Italy

1)Introduction to Capstone

2)Match graphics

3)Acceleration on inclined plane

4)Projectile motion- video analysis

Germany

Introduction into the app Phyphox

- simple pendulum with Phyphox-(functions of position, velocity and acceleration)
- spring pendulum with phyphox

France

- Experimental activity with 2 wheel robots to find the relation between time, distance, rotational and linear speed. Modifying a delay statement in a given C code to check the results. Then comparison with calculation. (Arduino IDE)

Portugal

- 1) free fall through time, measuring with "low tec" and "high tec" procedures and comparing they accuracy.
- 2) fall of a weight in two ways: with and without air resistance