Wydział Fizyki

POLITECHNIKA WARSZAWSKA

LabReinveneted

Open World Wide Lab. Infrastructure for student created experiments

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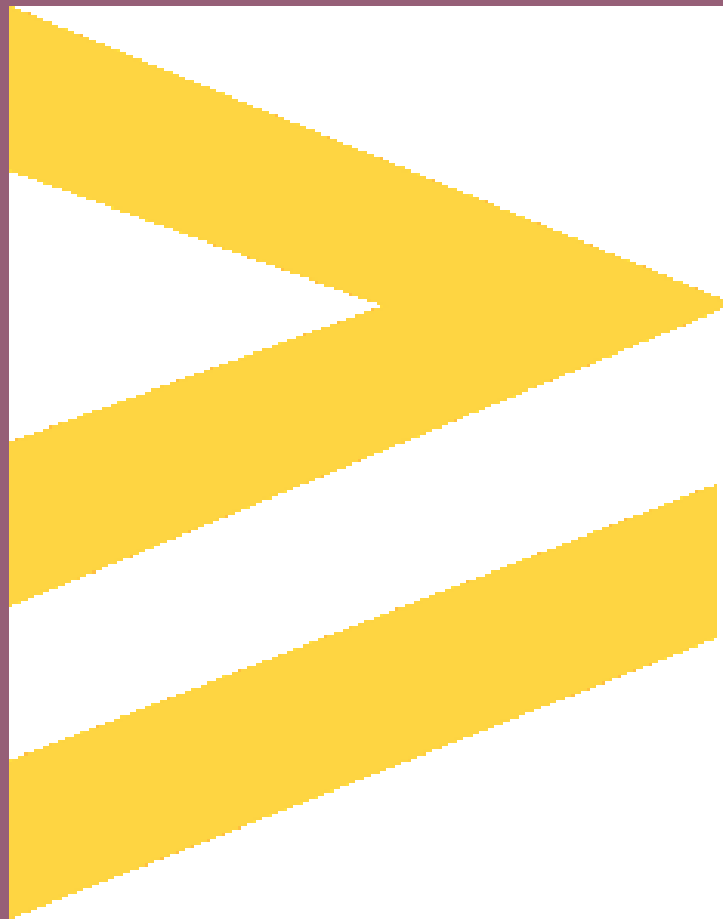


Faculty of Physics, Warsaw University of Technology - experience in EU projects

Participation in several FPs (> 15 since 2008) two H2020 and two Erasmus+ projects both as a coordinator or a partner

Currently coordination of two H2020 projects:

- STEM4youth (STEMforyouth.eu) – development of comprehensive, multidisciplinary series of courses presenting key STEM discipline challenges to support high school formal and informal education

- Renoir (http://renoirproject.eu/) discovery and reverse-engineering the mechanisms of information spreading in social media, such as dynamics of news releases, blog and internet, posts, Twitter messages, e-mails etc., training and exchange of knowledge between partners in different domains

and two Erasumus+ KA2 projects

- MakeITReal (http://makeitreal.info/) – Addressing underachievement in STEAM education through real product design and making practices using digital fabrication, making tools,3D modeling and 3D printing

- Holomaker (https://holomakers.eu/) Motivating secondary school students towards STEM careers through hologram making and innovative virtual image processing with direct links to current research and laboratory practices

Faculty expertize, areas of interest

We are interested in cooperation on educational projects (H2020 and other Programmes)or projects which include educational aspects

Results of our projects to be potentially exploited.

- STEM4youth.eu (H2020)
  - Open Learning Content Management Software (https://olcms.stem4youth.pl)-open source platform for downloading, publishing and organizing educational content (offers features like courses, quizzes, tagging, categorization, forum)
  - A number of multimedia courses for high school students in the areas of: Math., Physics, Chemistry, Astronomy, Engineering, Medicine and Citizen Science
  - Remote Physics Laboratory (access through OLCMS, still under development) – 7 experiments for high schools students, teachers and undergraduate students (Gamma Radiation Attenuation, Snellius, Michelson, Hall Effect, Doppler Effect, Black Body Radiation, Photoelectric Effect)
- MakeITReal (http://makeitreal.info/)
  - 3D printing guidelines
  - A number of 3D projects
- Holomaker (https://holomakers.eu/)
  - A recipe how to design and produce a hologram preparation kit using 3D printer.

LabReinvented - concept

Several projects like

- e-Fizyka(https://ilf.fizyka.pw.edu.pl/)
- GO-LAB (http://www.go-lab-project.eu/)
- LILA (http://www.lila-project.org/)

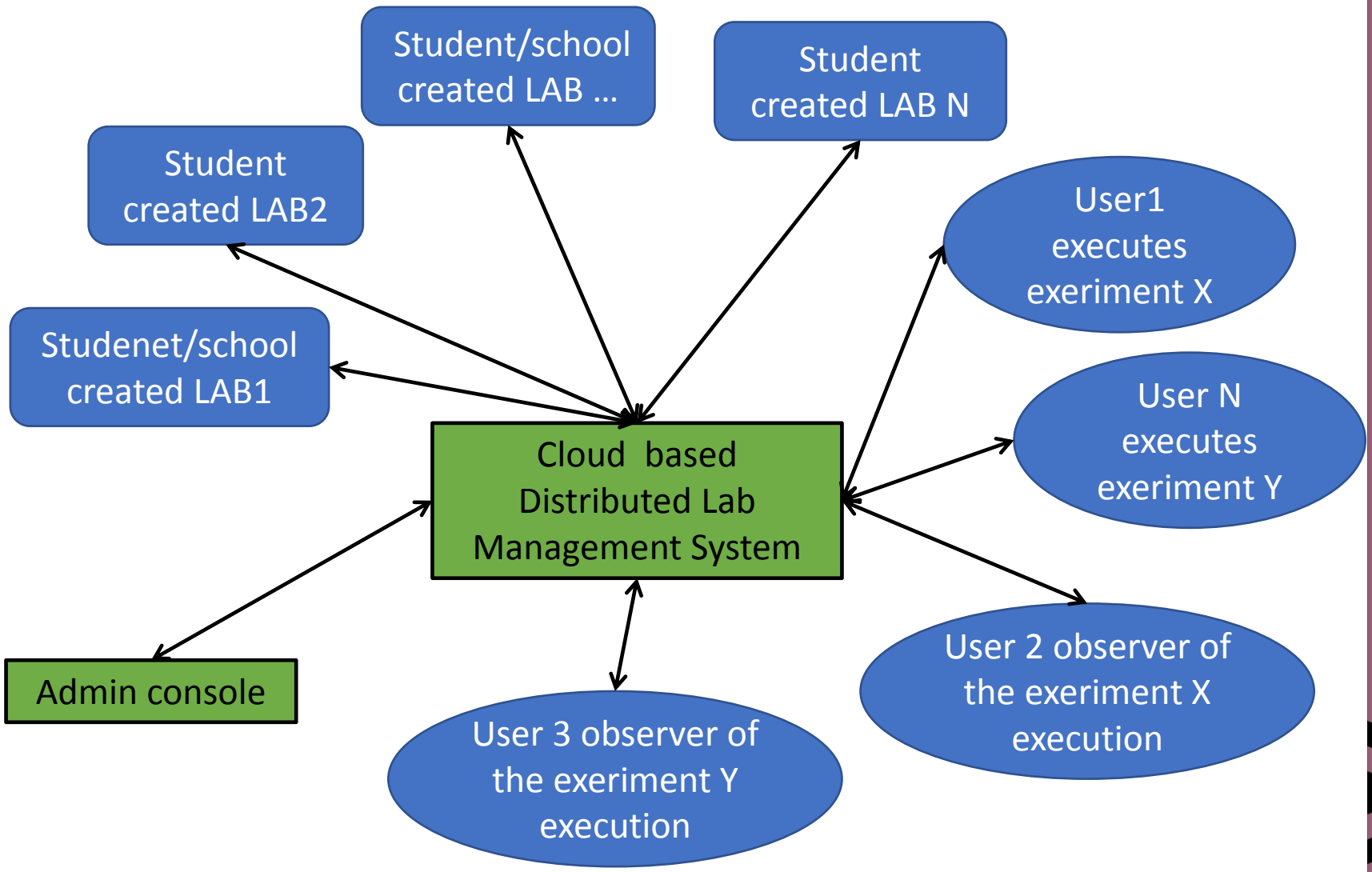
studied remote access to Laboratories and to the Lab Federations

Currently many leading universities offer remote access to their Lab. infrastructure

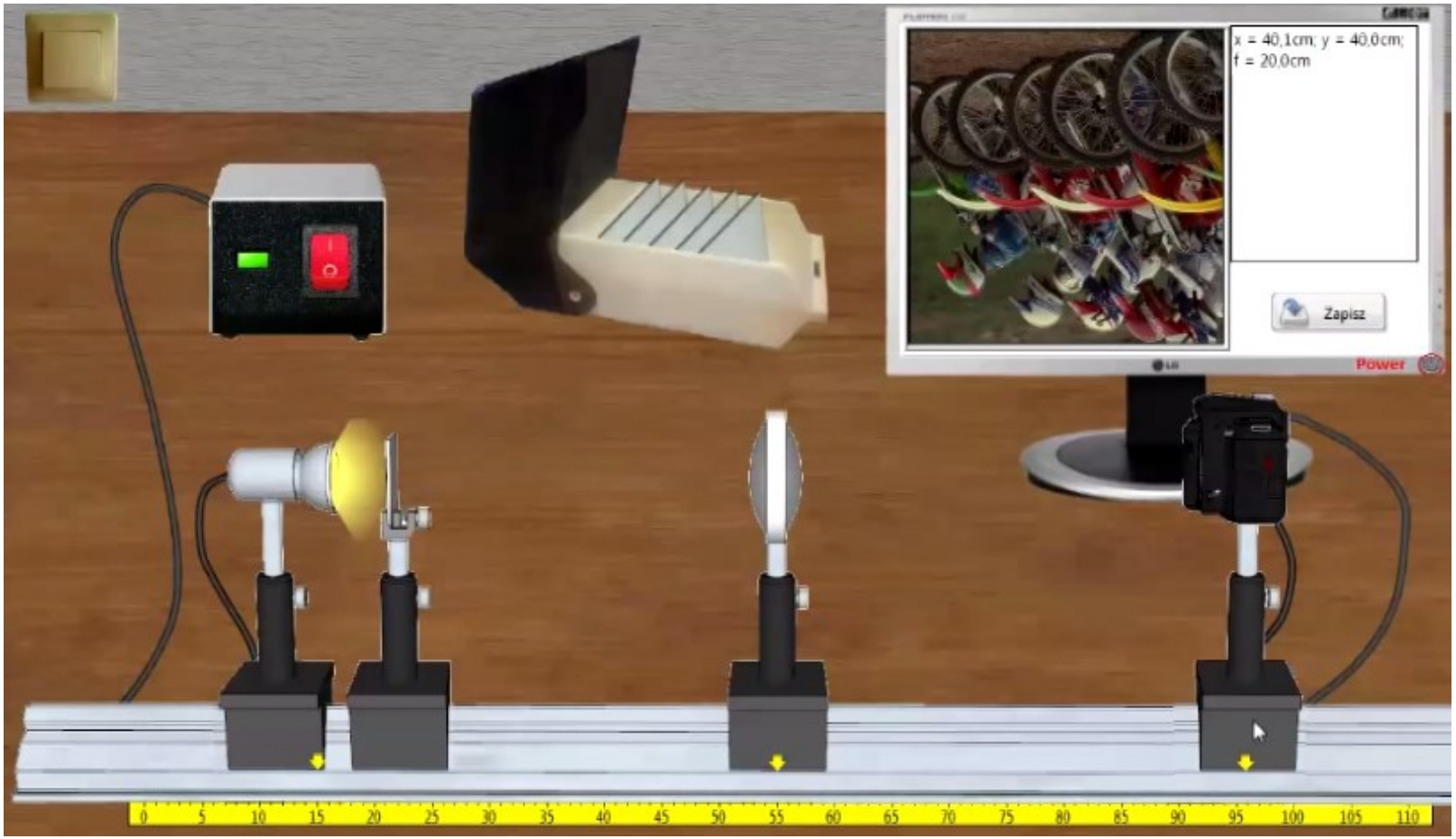
However, I far as I concern, **there has not been yet a concept explored** which would allow the users (mostly high school students and teachers)

- Create/construct their own experiments
- Connect these experiments to the central Lab. Management System and make them available for others
- So users all over the World could execute these experiments, measure experimental data, elaborate and discus results

LabReinvented – simplyfied system architecture



LabReinvented – an example of a student experiment



Experiment: Imaging properties of lens

LabReinvented – main poject tasks

- Develop a cloud based Lab. Management System (booking experiments, communication protocols, API)
- Develop and connect to this system and make publically accessible an initial (8-12) set of experiments
- Propose 10-20 ideas of experiments to be potentially implemented by students
- Prepare technical and procedural guidelines how to develop a new experiment and connect it to the platform (with suggestions which commercially available parts to use assembling the experiments)
- Develop and produce a number (1000?) of dedicated assembly sets the users may need to construct their experiment
- Engage many students, teachers and schools in the project
- Formulate a business model which would make the project sustainable after it ends (and it’s financing is over)

LabReivented – status

- The proposal based on this concept was already prepared and submitted (alas unsuccessfully)for ICT-22-2016 (technologies for learning and skills)
- The proposal after deep modification, update and extension may be resubmitted for H2020 or another programme.
- Type of partners needed:
  - Universities closely cooperating with high schools
  - Engineering Faculties at universities
  - Secondary and high schools, school associations
  - Universities / companies experienced in robotics
  - Parties with 3D printing expertize
  - Partners with dissemination/ exploitation potential

Q&A?

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