

EPFL - Tokyo Tech

Exchange program



Objectives

- Professional and cultural immersion : the program has a first didactic objective. Students will gain a lot of experience personally as well as professionally.
- Helvético-Japanese knowledge exchange
- Strengthen and extend EPFL-Tokyo Tech relations
- Long term project set-up if the project proves himself

Theme

Cities consume two-thirds of the world's energy and produce 70% of human CO2 emissions. In the European Union, buildings consume around 40% of all the energy produced annually.

In this context, the project will explore the topic of connected and smart cities, centered around individual buildings, with the direct objective of performance and capabilities improvement.

Specifications

The students should implement a solution that improves the energy consumption and/or reduces the environmental impact of an existing building. The solution should be

- Low cost
- Portable
- Connected (IoT)
- Autonomous (?)

Format

What is a hackathon ?

- Hacking is creative problem solving. (It does not have to involve technology.)
- A hackathon is any event of any duration where people come together to solve problems.

The adopted format is a collaborative hackathon, where the participants will come up with complimentary projects that add up in one big solution.

Groups

The students will form

- 6 groups of 2 Japanese students and 5 Swiss students
- 4 groups of 2 Japanese students and 4 Swiss students

Part 1: Discovery

The students will first do some field work, looking at various different types of buildings and their workings. Then they will visit the Environmental Energy Innovation building, part of Tokyo Tech, which incorporates the latest energy technology making it nearly self-sufficient and reducing CO2 emissions by 60%.

https://www.titech.ac.jp/english/research/stories/eei_building.html

Part 2: Brainstorming and idea generation

The students will first try out the brainstorming technique with a simple exercise. They will then take on the proposed problem and will together come up with the full picture using their findings from the previous days.

<https://www.drawtoast.com/>

Part 3: Solution development

Finally the students will have to build a proof of concept and develop a first prototype if they have time. They will buy the necessary materials from Tokyo (some tools and basic elements will be provided by TokyoTech).

Learning outcomes

The students will learn and gain experience in:

- Problem solving
- Idea generation and brainstorming
- Tinkering and prototype building
- Communication with people from different countries and backgrounds
- General knowledge in themes related to energy and IoT

Even though students may not be familiar with the topic of energy and IoT, the skills they will acquire are interdisciplinary.

Schedule

28/08 - Meetup and ideas generation

11:00 Greeting at Tokyo Tech
12:00 Lunch
13:00 Ice-breaking (Marshmallow challenge)
14:00 Theme introduction
15:00 Students get out do some visiting inside campus (EEI)
16:00 Free time (Start working on theme deciding)
18:00 Party @Tokyo Tech
(19:00?)

29/08 - Ideas and information gathering

09:00 Students are separated in groups and visit different sites
11:00 Ideas sharing
12:00 Lunch

15:00 Return to Tokyo Tech and main brainstorming
18:00 Akihabara shopping of main materials

30/08 - Prototype making

09:00 Prototyping
12:00 Lunch
19:00 End of workday

31/08 - Day 4

09:00 Students finalise their projects
12:00 Lunch
14:30 Projects presentations and feedback
(18:00) Closing ceremony & networking night at the Swiss Embassy

Follow-up

For the second part of the exchange, when Japanese students will come to Switzerland there are various interesting continuations:

- Field testing: students can equip an old building with improved prototypes and test the whole system
- Data management and analysis: students will follow a workshop and do a project to see what can be done with all the collected data
- Presentations: various specialists can do some presentations on what is currently done in the sphere of IoT and energy

Links

<https://www.c40.org/>

<http://www.ibec.or.jp/jsbd/>

<https://www.c2es.org/site/assets/uploads/2016/09/local-climate-action-cities-tackle-emissions-commercial-buildings-final.pdf>

<https://ec.europa.eu/energy/en/eubuildings>