

CONCEPT FOR MENTORING PROGRAM

D.T2.2.1 Concept for Mentoring Program
PP5 - BUT

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1. Pilot overview

Overview of the Pilot Action.

The concept of Pilot 1 at Brno University of Technology focuses on the enhancement of students' motivation, creativity and innovative thinking. FabLab as a shared workspace with a strong technological background seems to be an ideal tool for creating interesting projects that reach out to a wider range of students and attract them into the community of creators. Therefore, the aim of the pilot program was to cooperate with existing student communities associating motivated students with an interest in competition. Typical representative of this group of highly auto-motivated students is the student formula team. Their goal is to develop, build and test the Formula monopost within one year, and must always incorporate innovative features and procedures into the design. Linking the interests of such student groups with FabLab is mutually beneficial, as motivated teams will bring interesting projects needed to promote FabLab among other students. On the other hand, implementation of the project using state-of-the-art technology will increase the efficiency of the team and the quality of the results, while the students will gain further knowledge and experience with these technologies.

2. Mentoring Program

Overview of the mentoring program, plan of the activities, expected outputs.

The Mentoring Program aims to help participant to bring Ideas to Prototypes.

The Mentoring Program consists of 3 main phases: A training phase, a development phase and a realization phase. The mentoring program will take place in the winter semester, during which students are present at the university campus and thus can work on projects in parallel with their lectures. The training phase will be realized at the beginning of the semester, so the student would have the basic knowledge of the technologies, which they may use for the project realization. During second phase, students should develop the idea of the project set at the beginning and realize the technological limits, set the main goals and time scope. Through that period, the mentors are available for them to consult the proposed approach, designed components and the way of the manufacturing. They may do partial tests; work on the digital models; and use mentors knowledge to resolve uncertainties. The third phase is then about realization of the designed components. During this phase also hands on help of the mentors may take a place during use of advanced technologies in FabLab. Finally, student teams are asked to create a brief report summarizing the project aims and outputs.

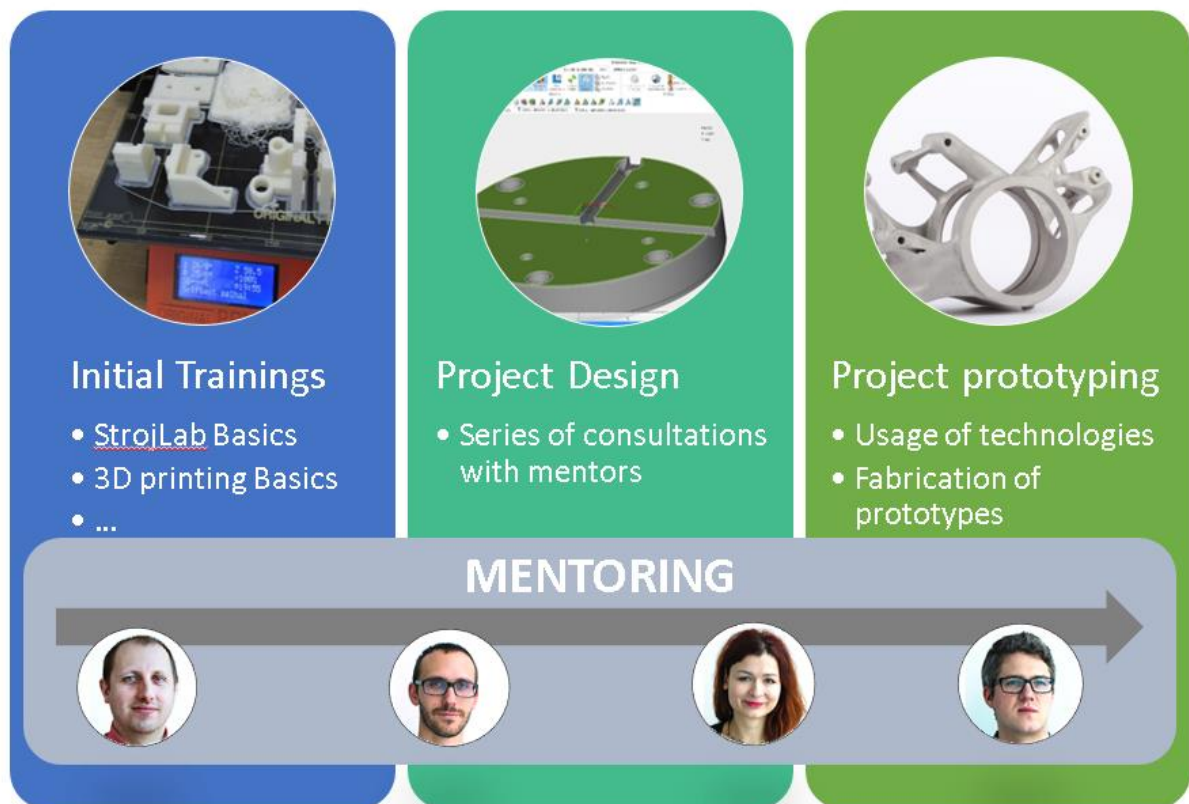
The main goals of the Mentoring Program are:

- To promote the StrojLab as the useful background for realization of student's projects by means of person to person recommendation based on the positive user/customer experience.
- To train students to become skilled in new technologies available in fablab.
- To actively simulate students to utilize the advanced technologies into their design process. To show that it brings new possibilities in the design regarding part complexity, fastening the development of incremental variants and in the end, lowering the costs of product development.

The Mentoring Program is divided in 3 phases:

1. **Initial Training:** An introductory course to StrojLab users and basic equipment use will be obligatory for all participants. Following that course, participants are able to choose the other trainings regarding the aim of their project. This is a fundamental step to familiarize students with the StrojLab community.
2. **Project Design:** The series of consultations with StrojLab mentors focused on transfer of knowledge about technological limits and applicability of individual technologies to designed product or solution. This phase should overcome the initial errors and more detail explanation of particular features and topics related to individual projects.
3. **Project Prototyping:** In the third part, the work focuses on the realization of prototypes and test parts by students themselves. This phase emphasize the practical hands on skills with particular technologies, which creates new know how by makers approach.

The Mentoring Program schematic:





3. Mentors

A general description on why you have selected these profiles, and a short Bio or profile for each teacher...

Daniel Koutny

Associate professor and head of the laboratory of Selective Laser Melting at the Brno University of Technology with 10 years of experience in 3D printing of plastics, 9 years of experience in 3D optical digitization and 5 years of experience in metal 3D printing, leading R&D projects and contractual research in additive manufacturing.

David Škaroupka

Industrial designer, engineer and innovator with 9 years of experience in product design and innovation focused on utilization of digital technologies in design process like algorithmic programming, auxetic structures etc., 4 years of experience in robotic machining and 3D printing of plastics, currently working in development of robotic 3D printing.

Tomáš Koutecký

Mechanical engineer and researcher with 7 years of experience in 3D optical digitization using structured light, developed sensor planning system for automated robotic 3D digitization. He has strong background in mechanisms and plastic 3D printing, 2 years' experience in computed tomography and 1 year experience in stereolitographic 3D printing.

Aneta Zatočilová

Young researcher with focus on contactless optical digitization in special applications, e.g. high temperature objects. She has 7 years of experience in 3D optical digitization, 2 years' experience in computed tomography and 1 year experience in stereolitographic 3D printing. She is currently leading research project on photogrammetry system for hot forgings.

4. Practical informations

Hours of mentorship, distribution of the mentoring sessions, salary, logistics...

The Mentoring program will be held in 3 months. It will last during winter semester of academic year 2017/2018. The decision of making pilot programme during semester is based on the students presence at the university and necessary time to develop and realize the projects. Each mentor has expertise in particular technology and is capable to provide sufficient support to students for managing their project. Each mentor is member of StrojLab realization team and receive salary from FabLabNet project.

Trainings and mentoring consultations took place in the StrojLab at Brno University of Technology.



5. Equipment and material

List of equipment/resources needed for the Pilot...

The participants to the Mentoring Program will have the complete access to the StrojLab facilities.

Thus, a whole pool of prototyping equipment will be available for them:

- 3D printer Dreamer
- 3D printer Stratasys SST1200es
- 3D printer JoseFFF (custom build printer 520x520x480mm)
- Sandblasting machines
- Tempering furnaces
- Vacuum forming machine Formech 660
- 3D scanning system ATOS Triple Scan
- Robotic machining KUKA KR 60 HA
- Metal 3D printer SLM 280HL
- Equipped workshop

Special tools were specifically acquired for the Pilot Actions:

- Soldering stations and basic electronics
- Microcontrollers (Arduino, RaspberryPI)
- Heat based wire cutter (for polystyrene and other plastics)
- Laboratory power supply
- Mechanical components
- Workshop tools

6. Target profiles

Description of the involved target(s) for the mentoring program...

The involved community of this Mentoring Program :

- Students community of Competitors, student teams involved in national and international events
- University students of Brno University of Technology
- Local partners