



INSTITUTE OF MACHINE AND INDUSTRIAL DESIGN

INSTITUTE OF MACHINE AND INDUSTRIAL DESIGN
Faculty of Mechanical Engineering
Brno University of Technology

BRNO UNIVERSITY OF TECHNOLOGY



- Founded in **1899**
- The oldest Czech university in Brno, the second oldest and largest university in the Czech Republic
- **8** faculties (FA, FEEC, FCH, FIT, FBM, FCE, FME, FFA), 3 university institutes (IFE, CESA, CEITEC)
- **7** research centres (AdMaS, CMV, CVVOZE, NETME Centre, SIX, CEITEC, IT4Innovations)
- **24 000** students in bachelor, master and doctoral degree programmes
- **2 500** employees (of which **1 000** are academic staff)



FACULTY OF MECHANICAL ENGINEERING

BRNO FACULTY
UNIVERSITY OF MECHANICAL
OF TECHNOLOGY ENGINEERING

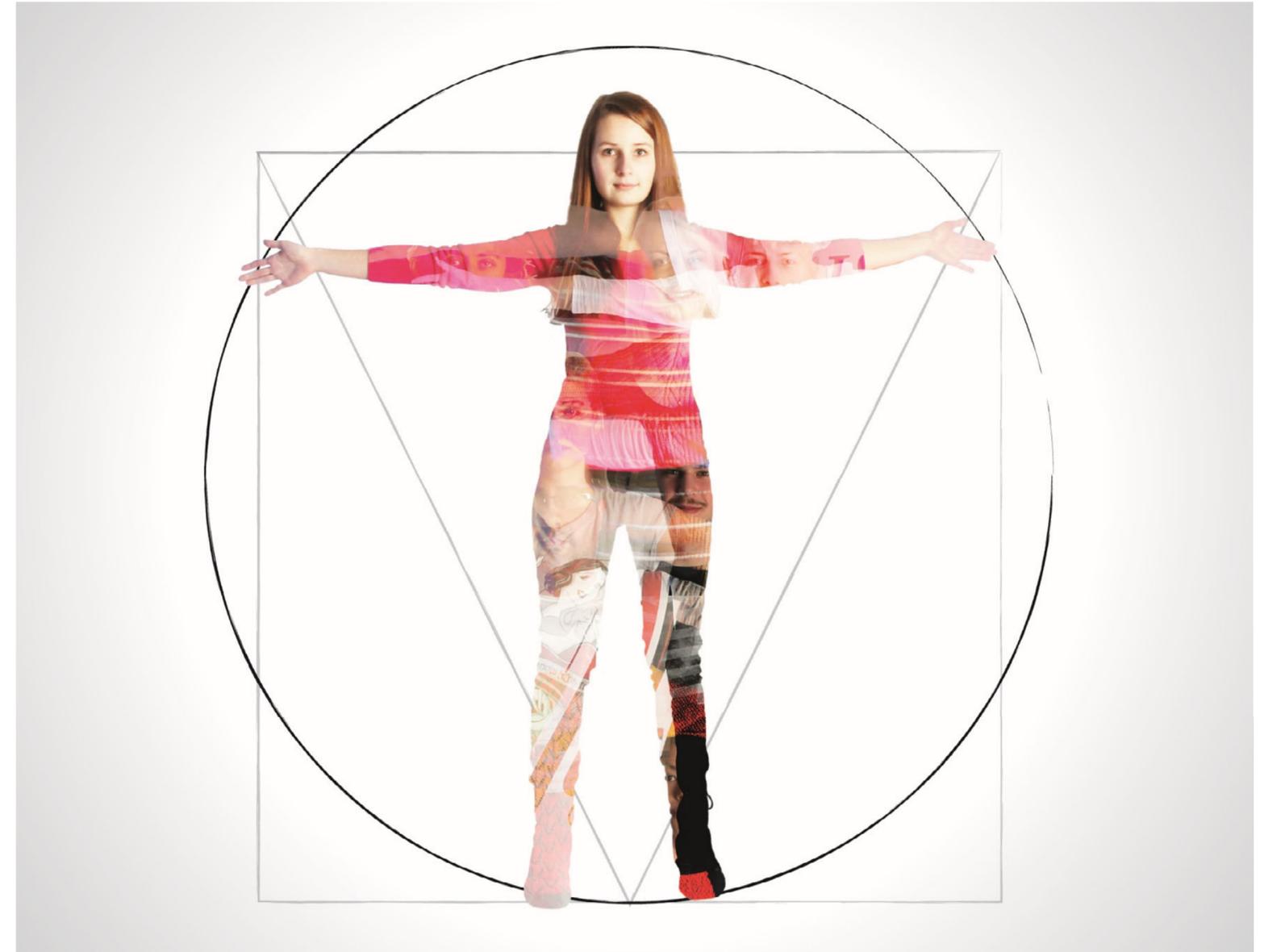
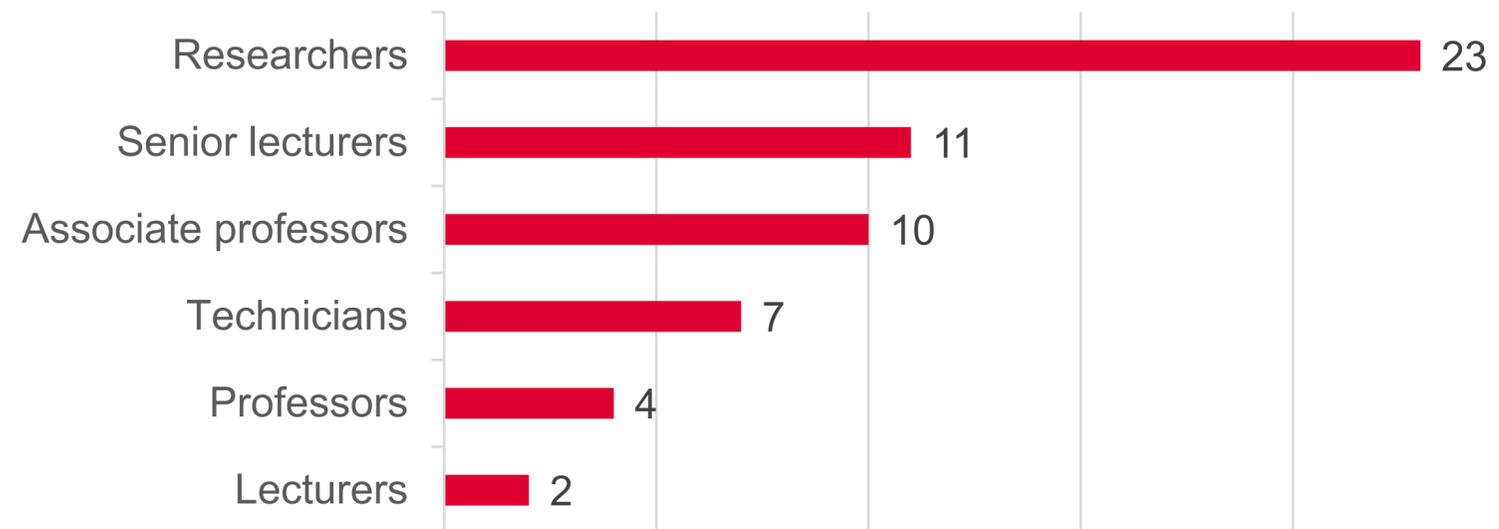
- Founded in **1900**
- The second largest faculty of Brno University of Technology
- **13** institutes, **2** specialized centres
- **1** regional research and development centre – NETME Centre (New Technologies for Mechanical Engineering)
- **4 500** students in bachelor, master and doctoral degree programmes
- **703** employees (of which **353** are academic staff)



INSTITUTE OF MACHINE AND INDUSTRIAL DESIGN

- Founded in **1901**
- Infrastructure covering **3 570 m²**
- **57** employees (**45 FTE**)
- **23** doctoral students (**20** full-time)
- Tuition - **2 000** students per year

STRUCTURE OF EMPLOYEES





VISION

To be considered an internationally recognized research institution providing top-level master and doctoral study in the field of machine and industrial design.

GOALS

To carry out top-level research and development.

To cooperate with industrial and public sector with the aim to implement innovations.

To transfer the latest findings from research to degree study programmes.

MISSION

To acquire and apply the latest research-based knowledge and findings in the field of machine and industrial design, to share them via all degree programmes in order to develop the professional capacity of university.

ORGANIZATIONAL STRUCTURE

Institute
secretaries



Ivana URBÁŠKOVÁ
Financial Secretary



Klára JAVORČEKOVÁ
Education and External
Relations Secretary



Ivana MUŽÍKOVÁ
Operations, Human Resources
and R&D Secretary

Heads
of departments



Prof. Martin HARTL
Director



Dr. Daniel KOUTNÝ
Deputy Director



Prof. Ivan KŘUPKA
Tribology



Dr. Ivan MAZŮREK
Condition Monitoring



Dr. David PALOUŠEK
Reverse Engineering and Additive
Technologies



Dr. Ladislav KŘENEK
Industrial design

Tuition
coordinators



Dr. Petr SVOBODA
1st and 2nd year of bachelor degree
programme Fundamentals of
Mechanical Engineering



Dr. Martin VRBKA
3rd year of bachelor degree
programme Fundamentals of
Mechanical Engineering

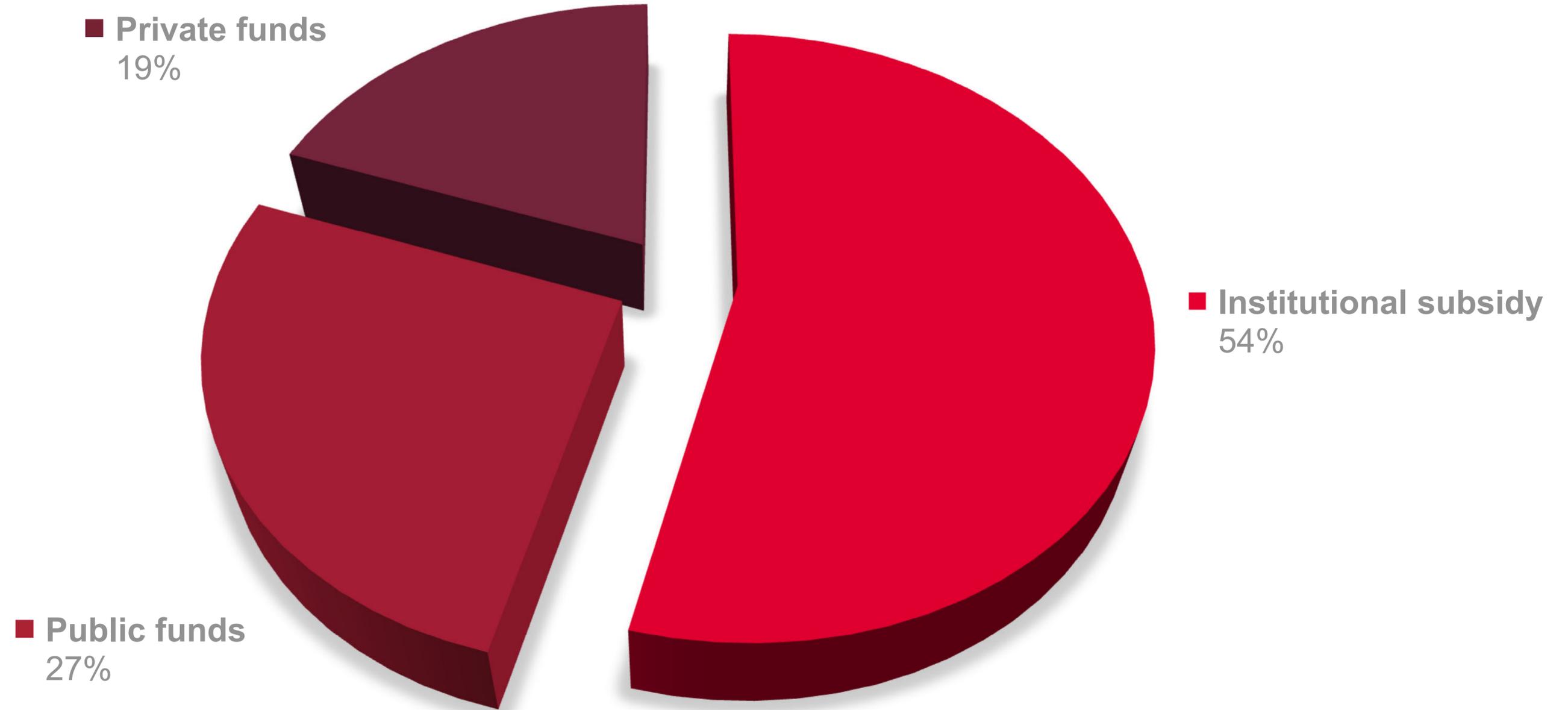


Dr. Radovan GALAS
4th and 5th year of master degree
programme Mechanical Engineering
Design

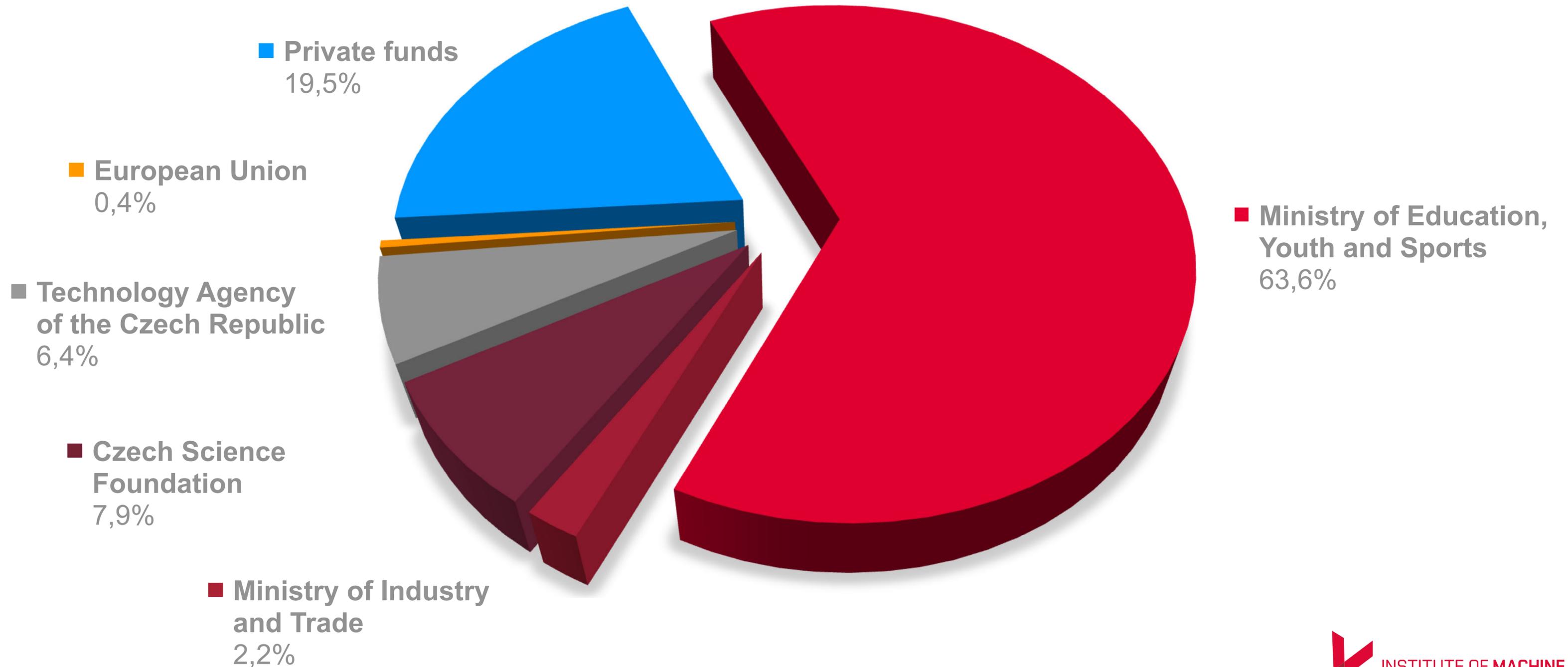


Dr. Dana Rubínová
Bachelor and master degree
programme Industrial Design

FUNDING BY TYPE



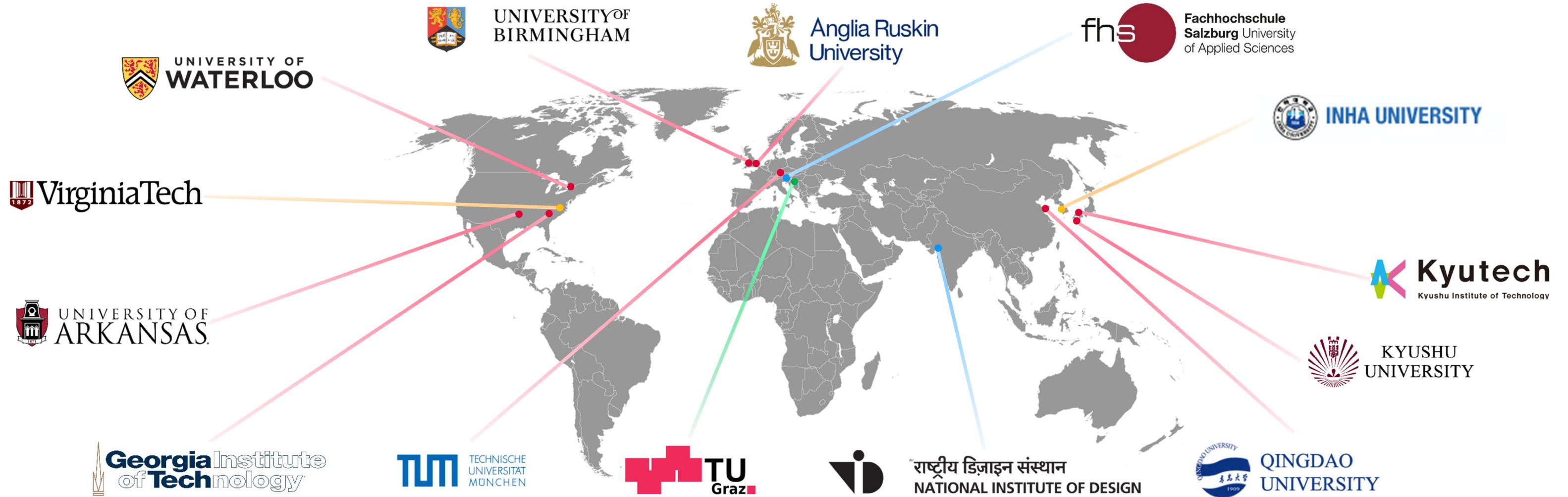
FUNDING BY PROVIDER



PARTNERS OF CONTRACTUAL RESEARCH



INTERNATIONAL PARTNERS



- Tribology
- Condition Monitoring
- Reverse Engineering and Additive Technologies
- Industrial Design

KEY COMPETENCES

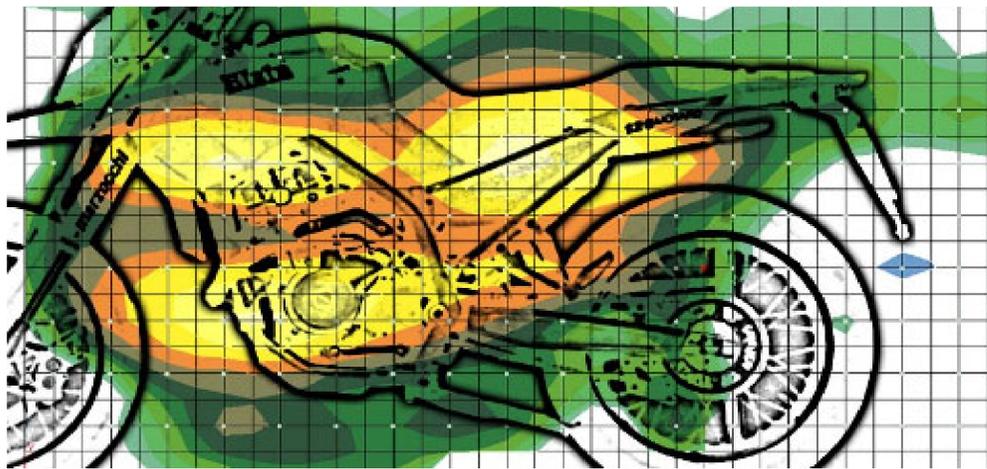
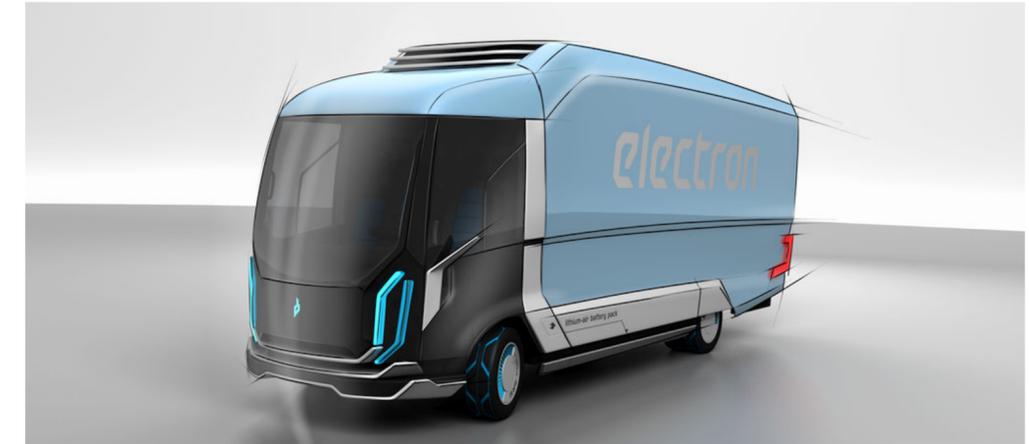
Tribology



Biotribology



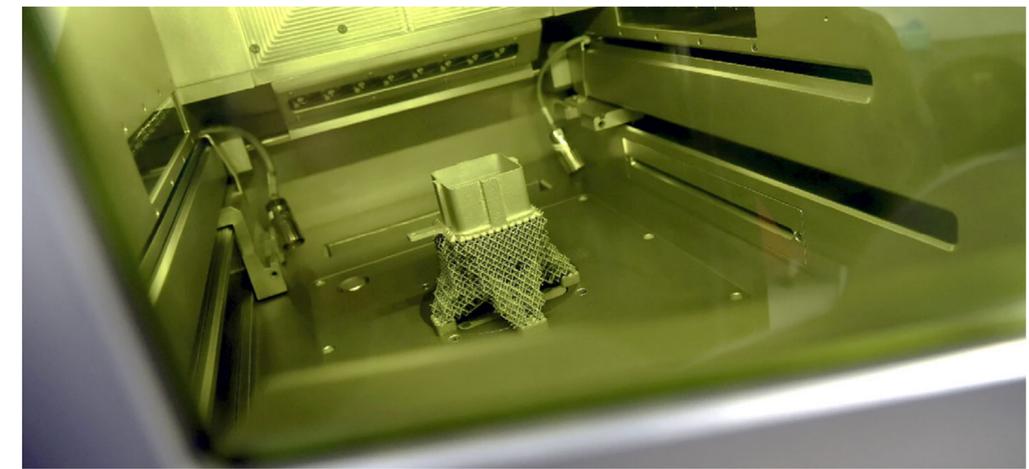
Industrial Design



Condition Monitoring and Vibroacoustics



3D Digitization and Reverse Engineering



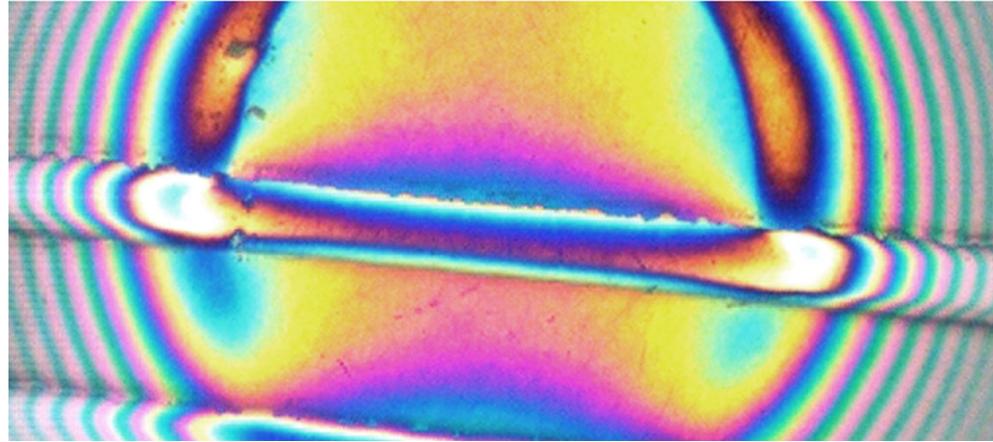
Metal 3D Printing

TRIBOLOGY

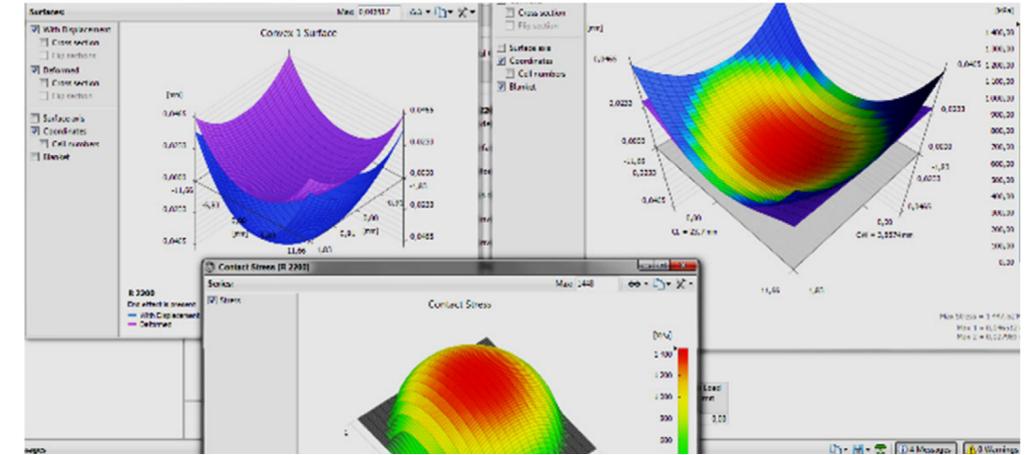
Elastohydrodynamics



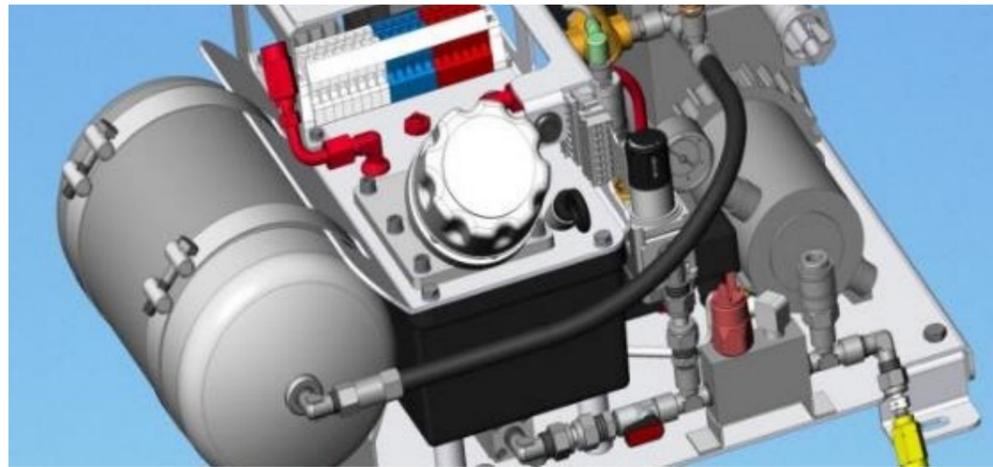
Thin Film Lubrication



Computing Tools



Rail Transport



Lubrication Systems



Friction and Lubrication of Artificial Joints

CONDITION MONITORING

Magnetorheological devices



Noise Source Localization



Development of Diagnostic Devices



Research of Magnetorheological Elements



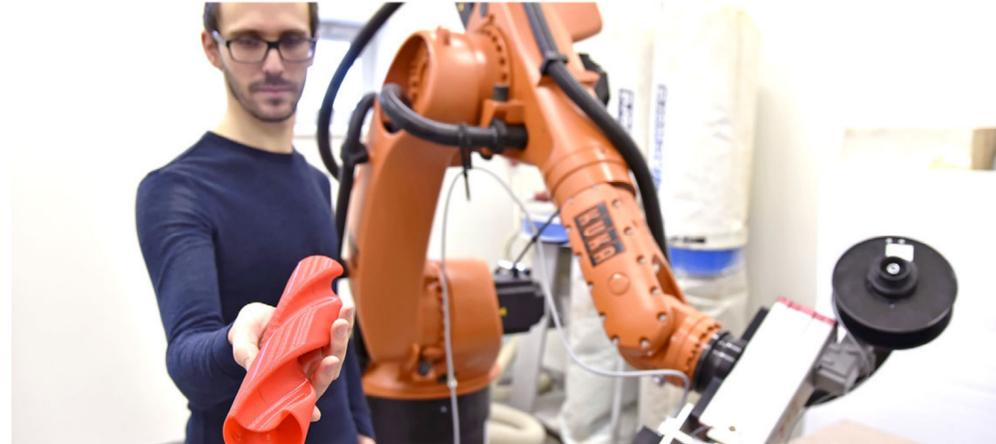
Expert Based Analyses

REVERSE ENGINEERING AND ADDITIVE TECHNOLOGIES

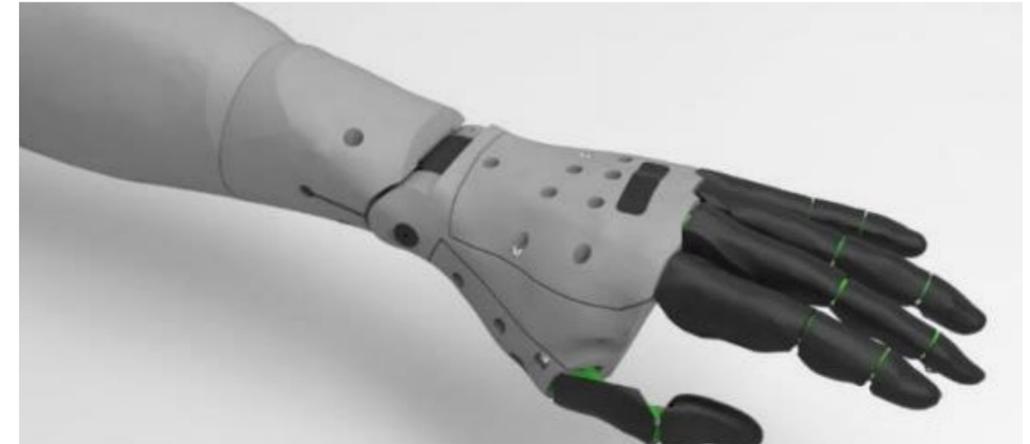
Quality Control in Manufacturing



Robotic Machining of Large Scale Components



Rapid Prototyping in Prosthetics



3D Optical Digitization



Additive Manufacturing of Metal Parts



Mechanical Engineering Design

INDUSTRIAL DESIGN

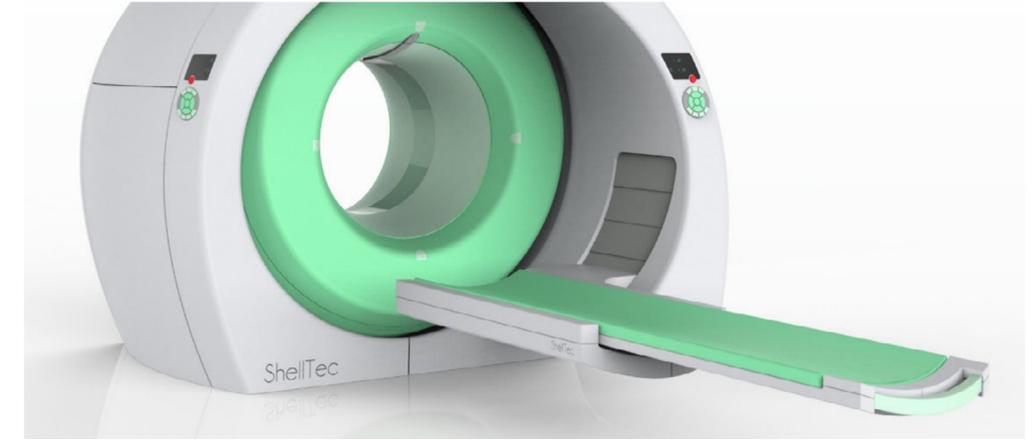
Conceptual Design



Products and Appliances



Medical Devices



Tools and Instruments

Vehicles

Production machines

DEGREE PROGRAMMES

BACHELOR DEGREE

FUNDAMENTALS OF MECHANICAL ENGINEERING

- **1 920** students
- **6** compulsory courses, **78** h of lectures, **156** h of tutorials
- **3** optional courses, **52** h of lectures, **65** h of tutorials

INDUSTRIAL DESIGN

- **62** students
- **30** compulsory courses, **195** h of lectures, **1 135** h of tutorials

MASTER DEGREE

MECHANICAL ENGINEERING DESIGN

- **56** students
- **21** compulsory courses, **238** h of lectures, **1 174** h of tutorials

INDUSTRIAL DESIGN

- **41** students
- **20** compulsory courses, **117** h of lectures, **1 209** h of tutorials

DOCTORAL DEGREE

MACHINES AND EQUIPMENT - DESIGN AND PROCESS ENGINEERING

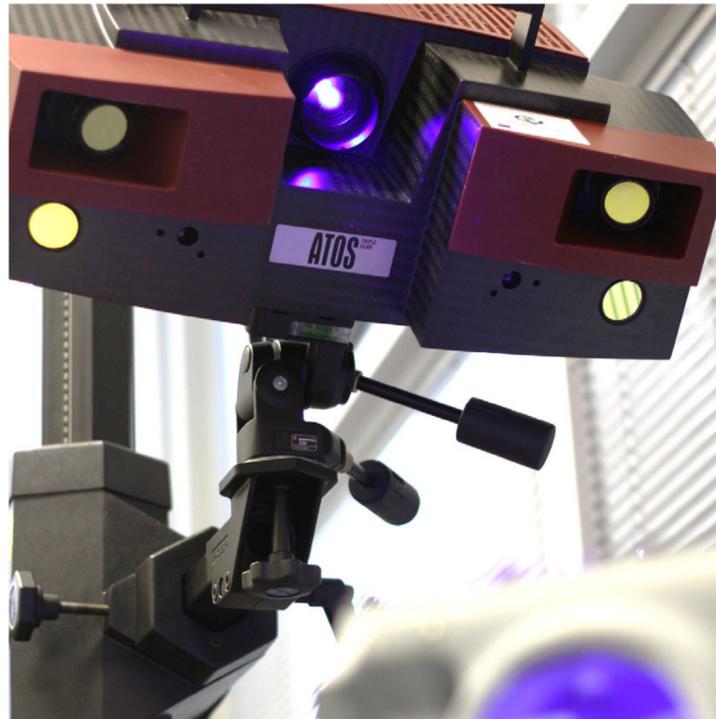
- **18** students
- **8** optional courses, **160** h of lectures

DEGREE PROGRAMME: MECHANICAL ENGINEERING DESIGN

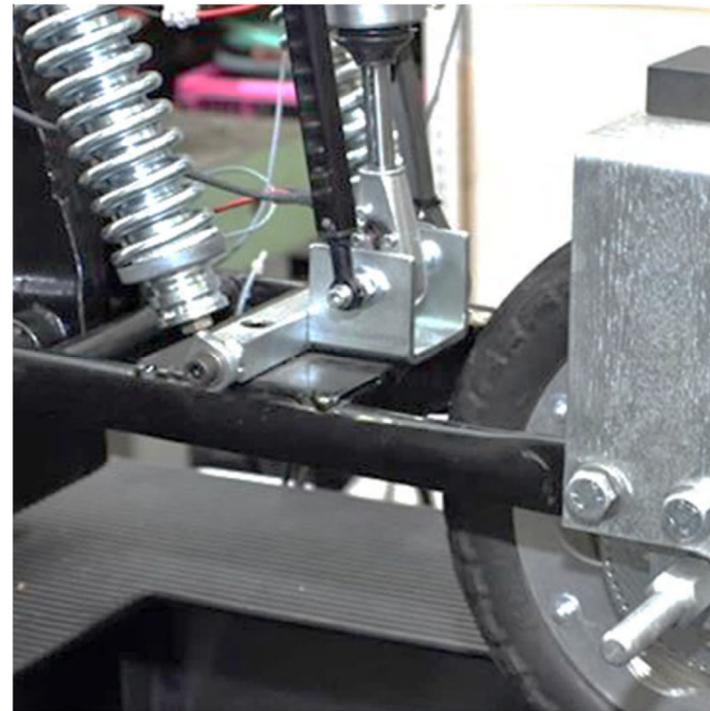
- Project-oriented and research-oriented teaching
- Solving of multidisciplinary projects
- Engineering approach

- Acquiring of problem solving method
- Teamwork
- Top-class facilities and laboratories

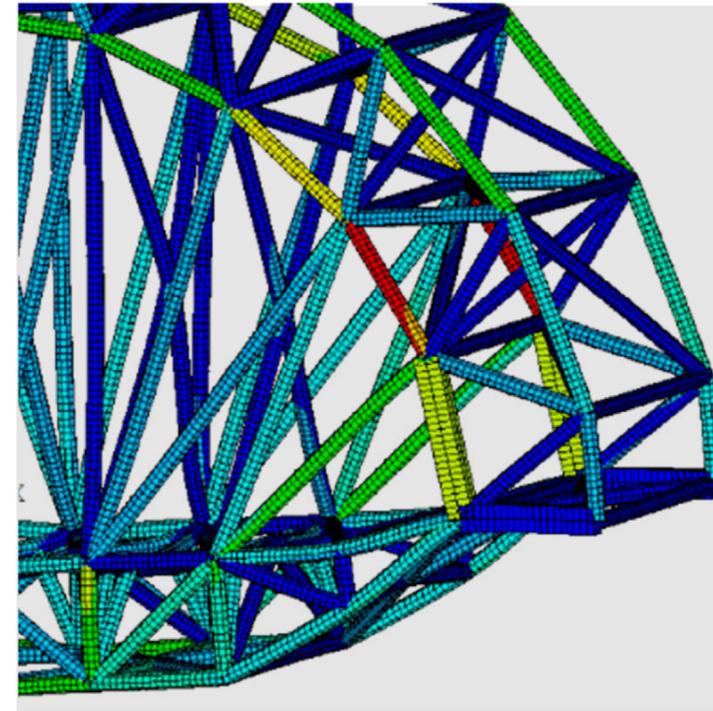
3D DIGITAL TECHNOLOGIES



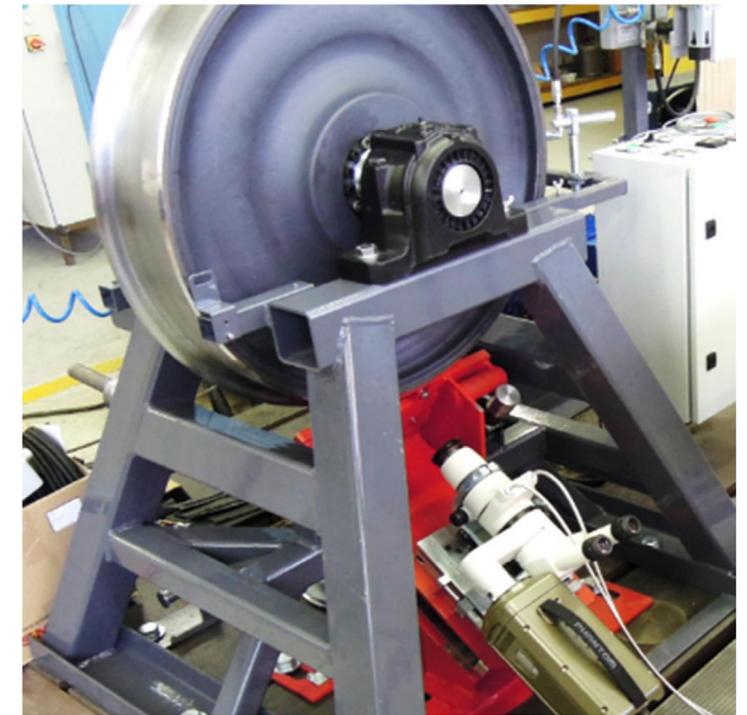
CONDITION MONITORING



ENGINEERING ANALYSES AND SIMULATIONS



TRIBOLOGY



DEGREE PROGRAMME: INDUSTRIAL DESIGN

- Design of industrial products
- Traditional design methods
- Progressive technologies

- Emphasis on creativity, aesthetics and ergonomics
- Combination of artistic and technical approach
- Workshops with industrial partners

PRODUCT DESIGN



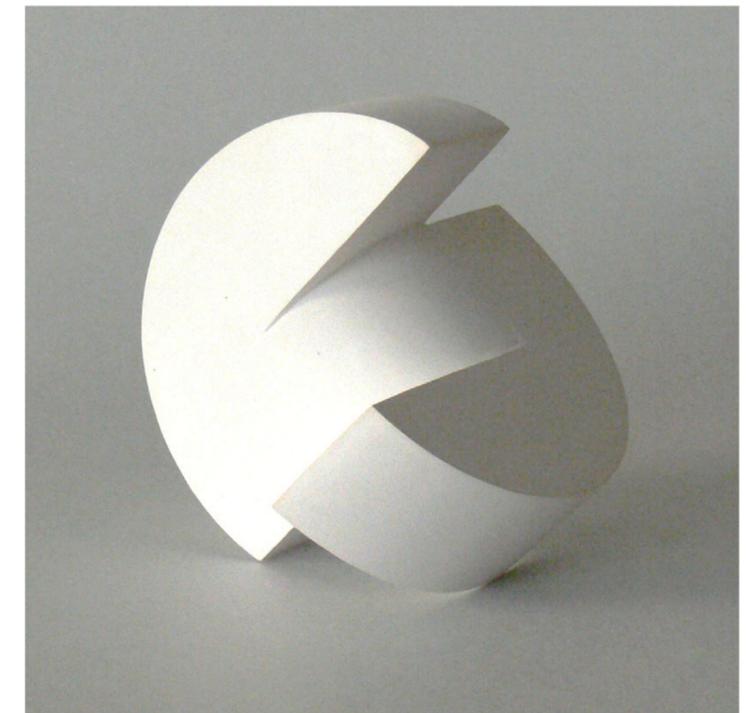
ERGONOMICS



3D MODELLING, VISUALIZATION, ANIMATION



ARTISTIC TECHNIQUES AND MODELMAKING



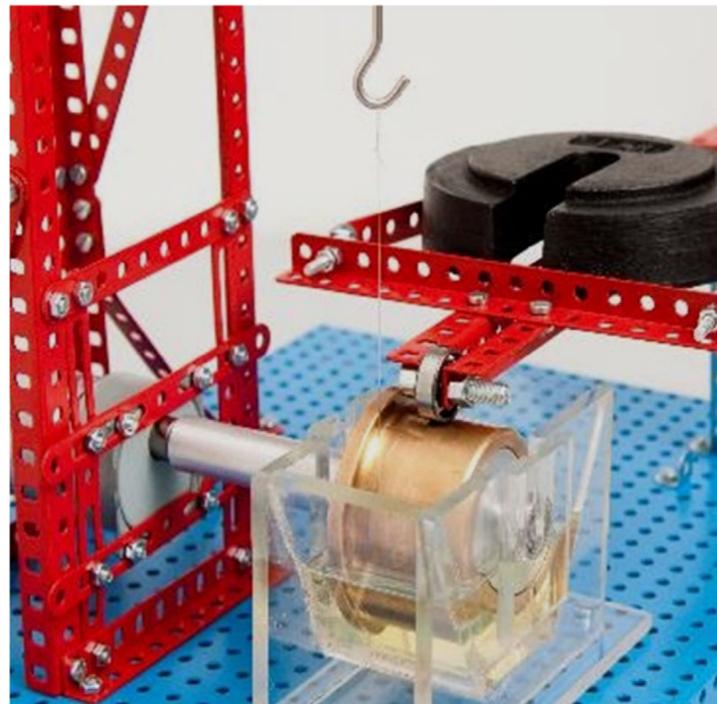
PROJECT-ORIENTED TEACHING

- Block teaching of theory
- Comprehensive multidisciplinary projects
- Focus on real outcomes

- Project management, scheduling, division of tasks
- Teamwork
- Demands of projects increase gradually

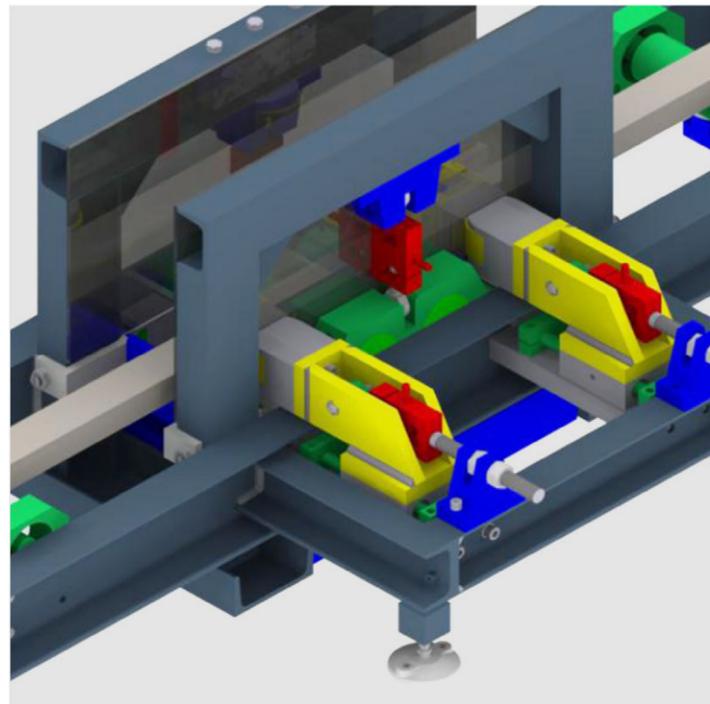
1st SEMESTER

4 simple team projects



2nd SEMESTER

2 advanced design projects



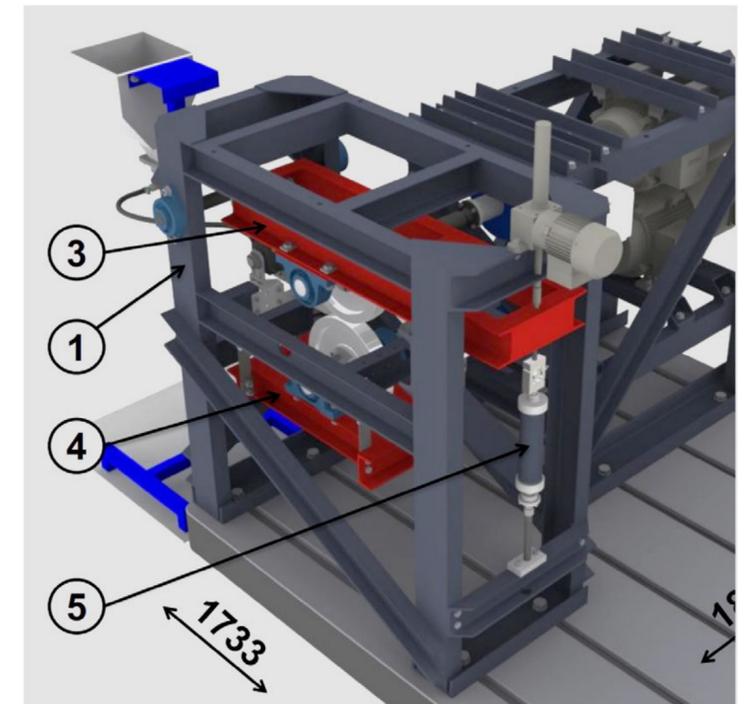
3rd SEMESTER

1 demanding engineering project

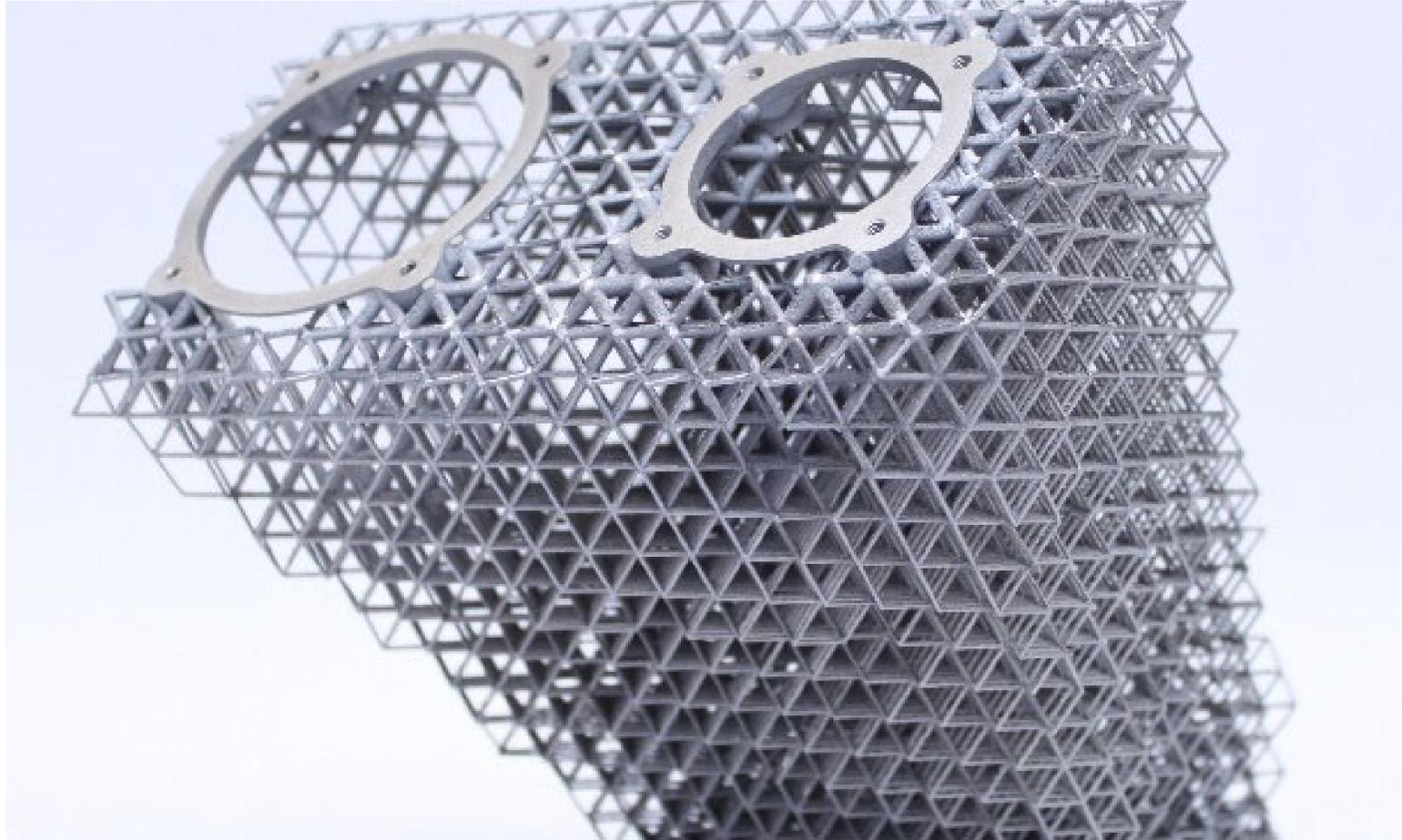


4th SEMESTER

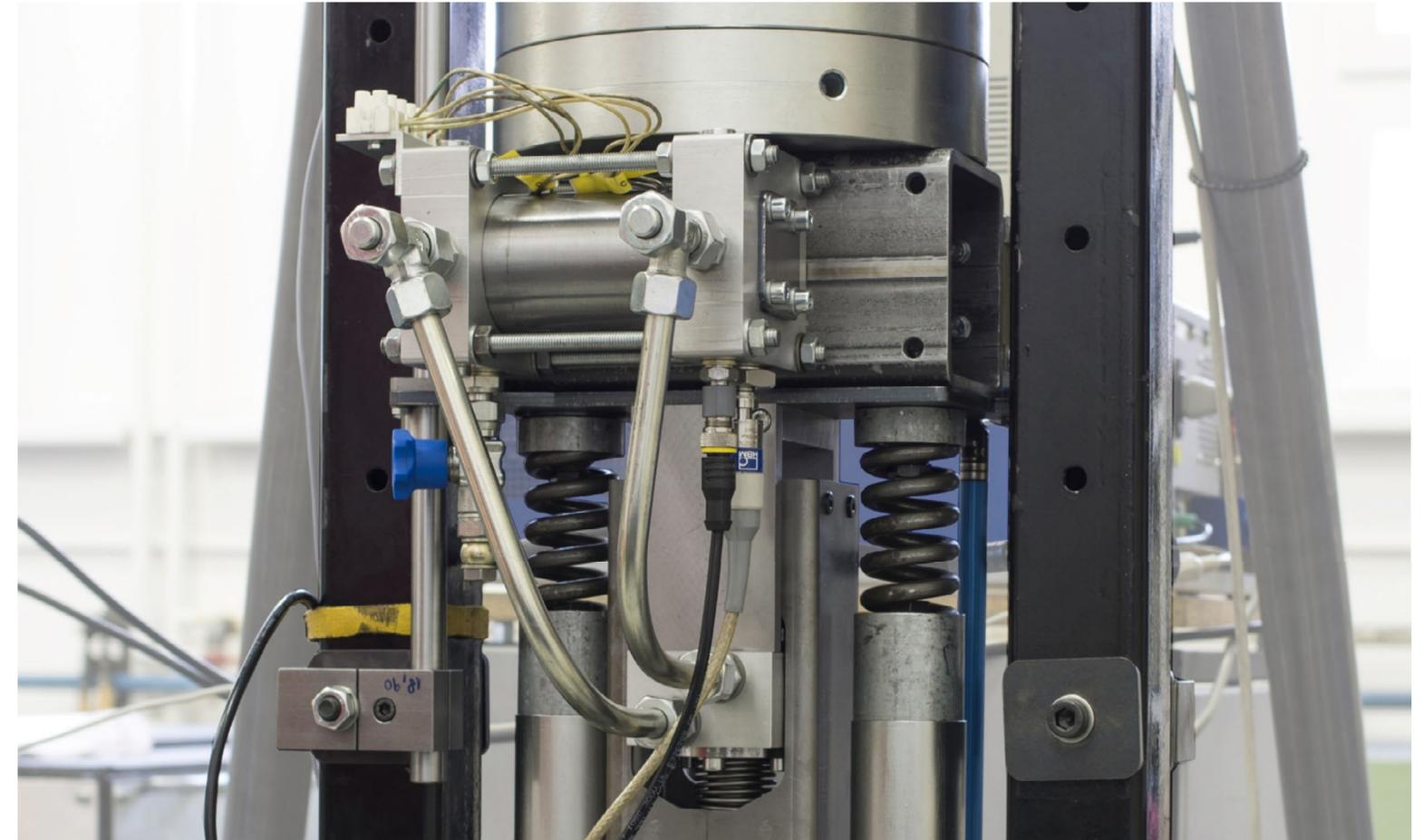
Diploma thesis project



COOPERATION WITH INDUSTRY



Development and 3D print of optimized satellite console for cosmic industry

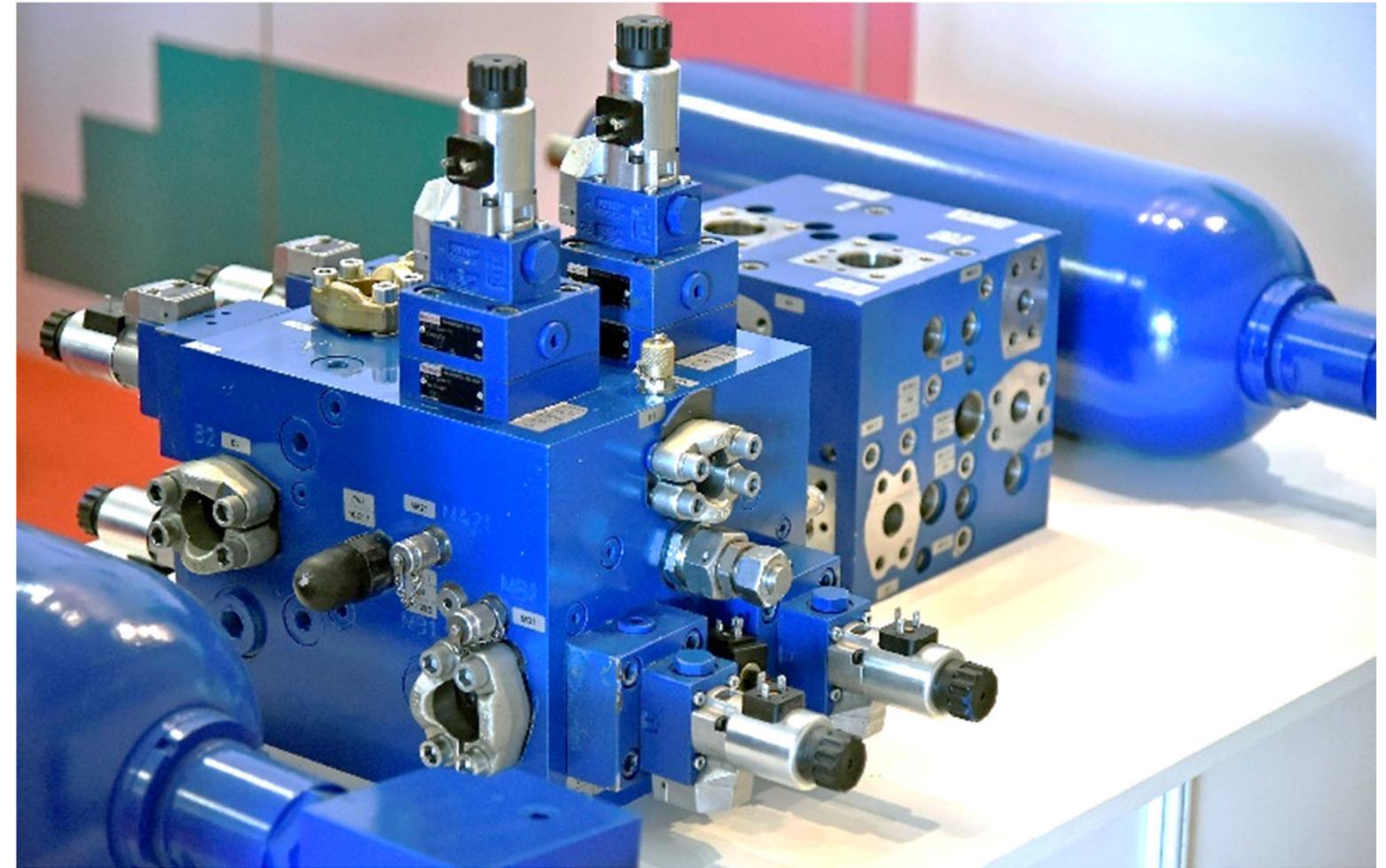


Semi-actively damped strut for vibration isolation of payload of Ariane 6 launcher

COOPERATION WITH INDUSTRY



Development of experimental device for testing of journal bearings

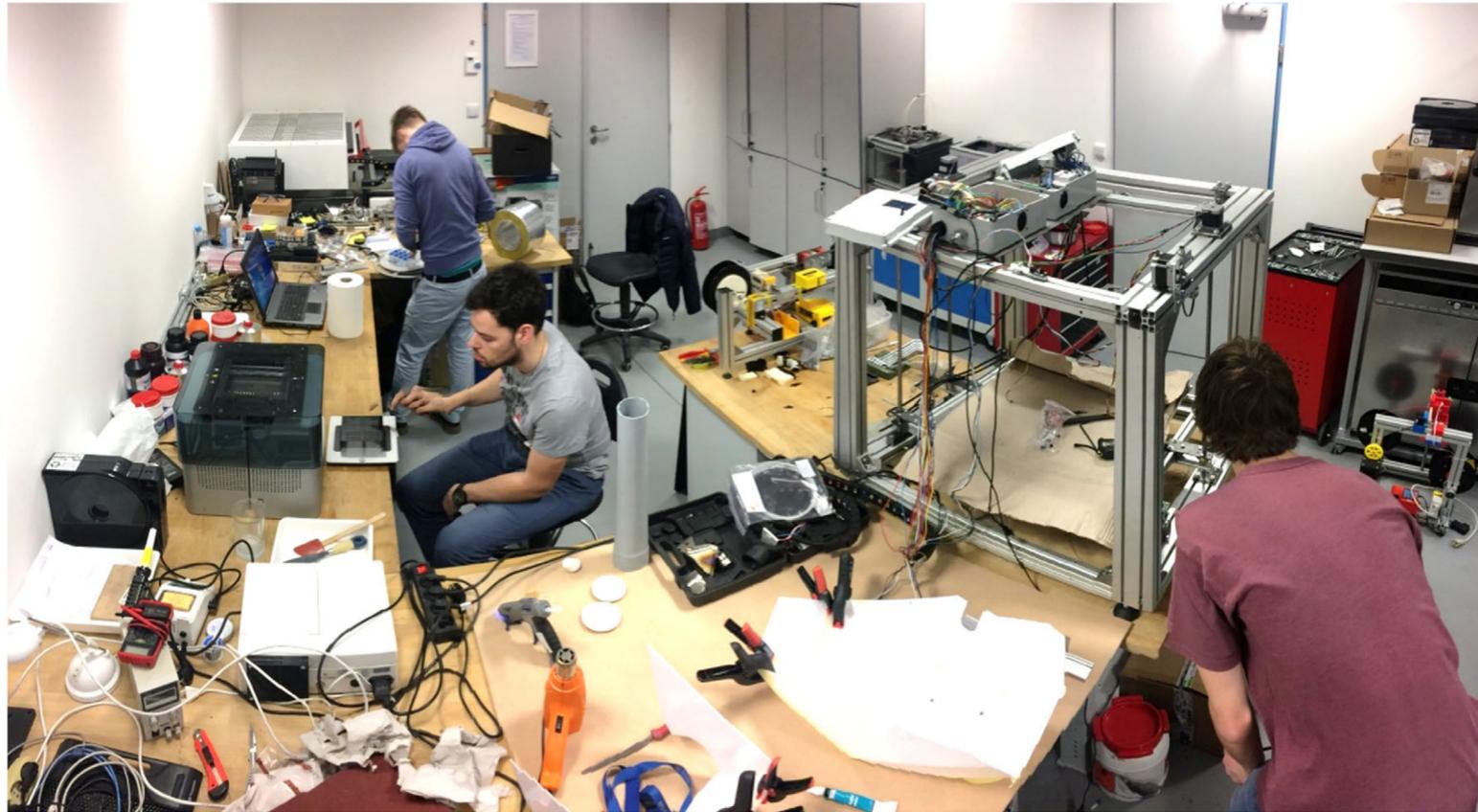


Hydrostatic recuperative module for fuel saving of road roller

STROJLAB – LABORATORIES OPENED FOR STUDENTS (FABLAB)

- FabLab = Fabrication Laboratory
- Digital manufacturing tools
- Space for creativity

- Individual students' projects
- Support of project-oriented teaching
- First university FabLab in the Czech Republic



PNEUMOBIL RACING TEAM BRNO

DEVELOPMENT OF STUDENT RACING VEHICLE POWERED BY COMPRESSED AIR

- Effective use of compressed air energy
- Development and manufacturing of racing car within one year
- Utilization of knowledge acquired from study
- Mechanisms, pneumatic systems, electronics
- Cooperation with industrial partners



AVENTICS PNEUMOBILE COMPETITION 2017

- 37 student teams
- 7 European countries
- 7th place Acceleration
- 7th place Arcade race
- 4th place Top Speed





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www.ustavkonstruovani.cz