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)

INSTITUTE OF **MACHINE** AND **INDUSTRIAL DESIGN**

FACULTY OF MECHANICAL ENGINEERING

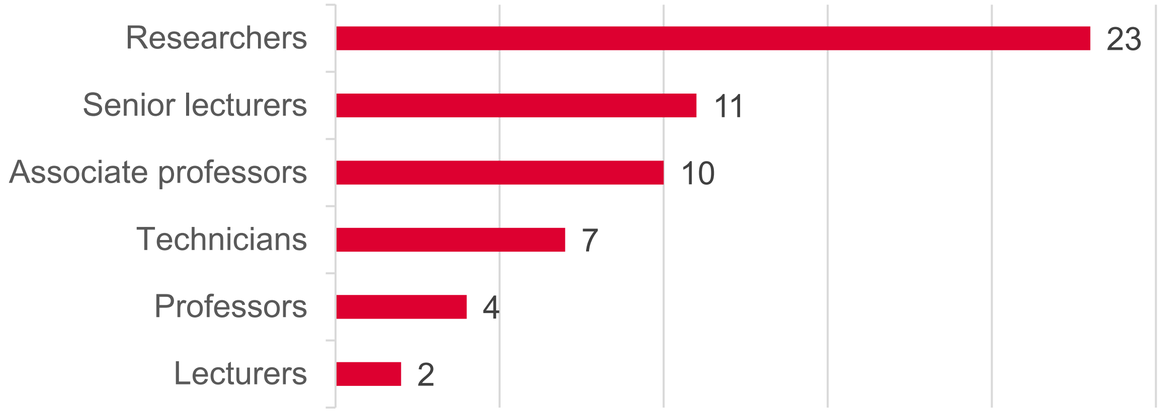
BRNO UNIVERSITY OF TECHNOLOGY
FACULTY OF MECHANICAL ENGINEERING

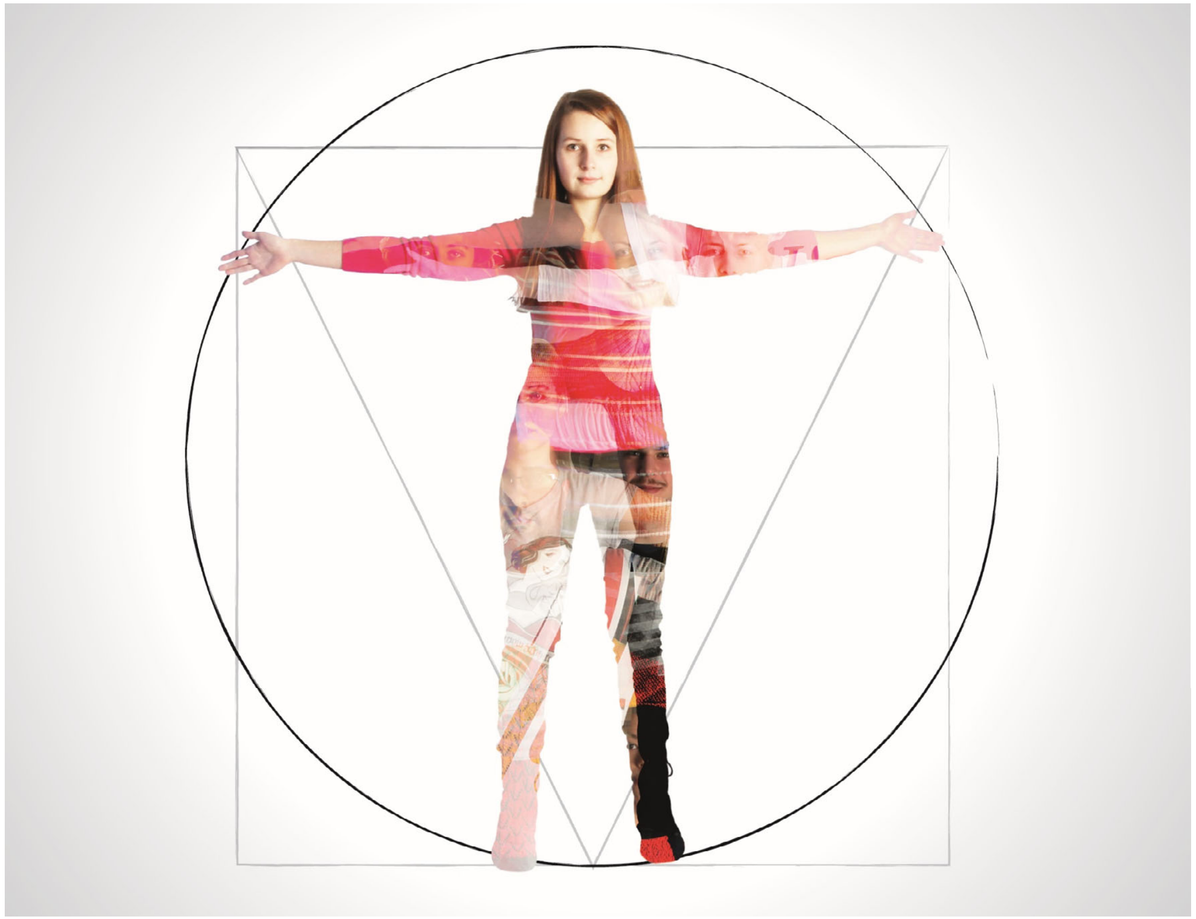
- Founded in **1900**
- The second largest faculty of Brno University of Technology
- **13** institutes, **2** specialized centres
- **1** regional research and development centre – NETME Centre (New Technologies for Mechanical Engineering)
- **4 500** students in bachelor, master and doctoral degree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





INSTITUTE OF **MACHINE** AND **INDUSTRIAL DESIGN**

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

Prof. Martin HARTL
Director

Institute secretaries

Dr. Martin VRBKA
Financial Secretary

Dr. Daniel KOUTNÝ
Education Secretary

Dr. Petr SVOBODA
R&D Secretary

Heads of departments

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. Milan Klapka
4th and 5th year of master degree programme Mechanical Engineering Design

Dr. Dana Rubínová
Bachelor and master degree programme Industrial Design

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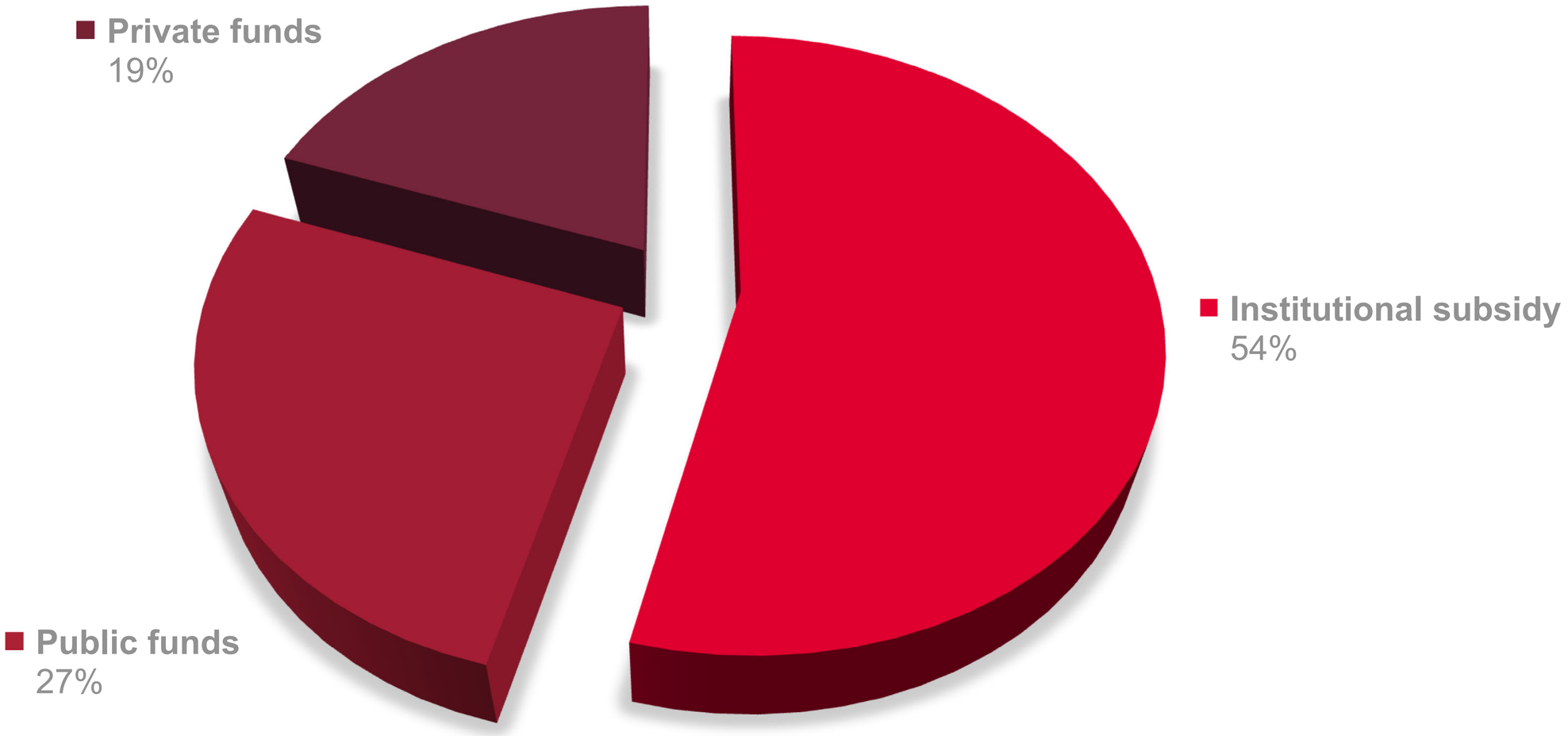
FUNDING BY TYPE



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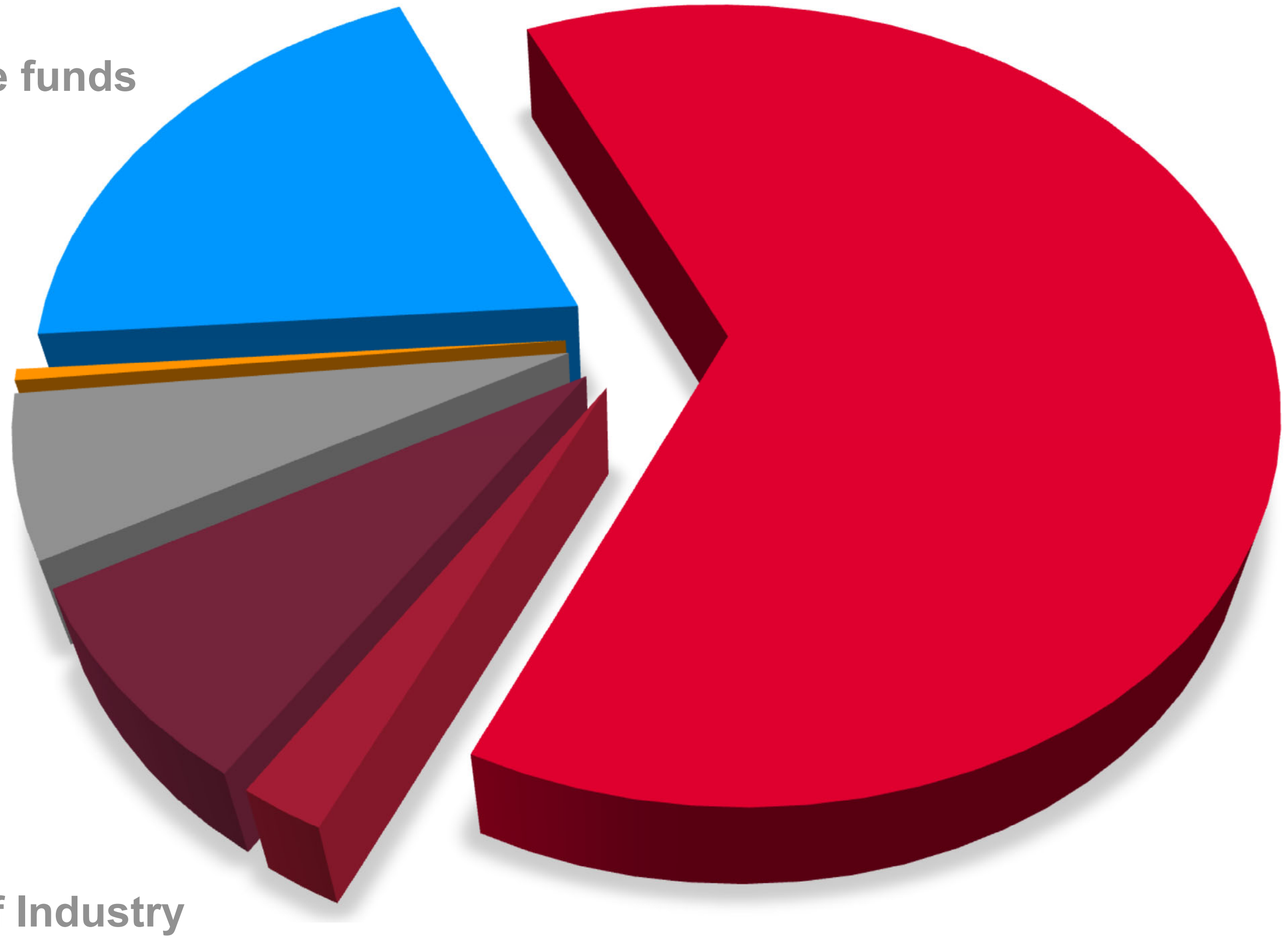
FUNDING BY PROVIDER



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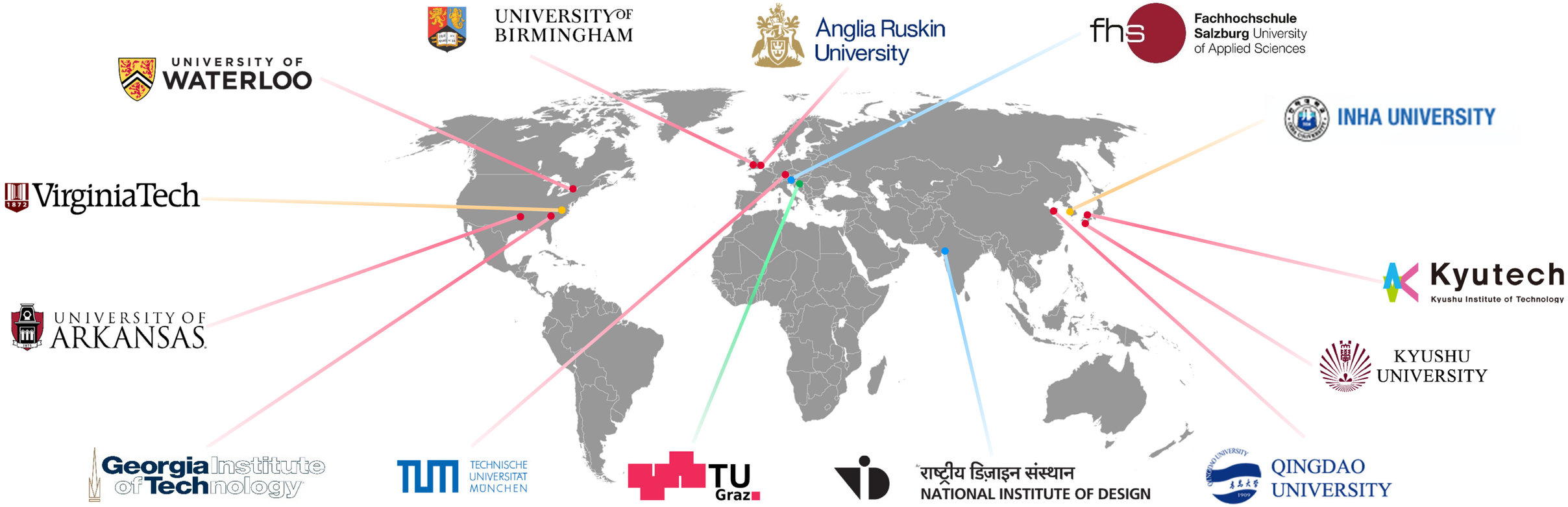
PARTNERS OF CONTRACTUAL RESEARCH

INSTITUTE OF MACHINE AND INDUSTRIAL DESIGN

INTERNATIONAL PARTNERS



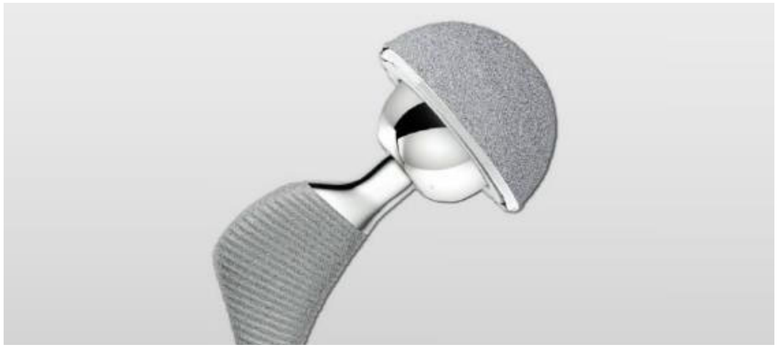
- Tribology
- Condition Monitoring
- Reverse Engineering and Additive Technologies
- Industrial Design

INSTITUTE OF MACHINE AND INDUSTRIAL DESIGN

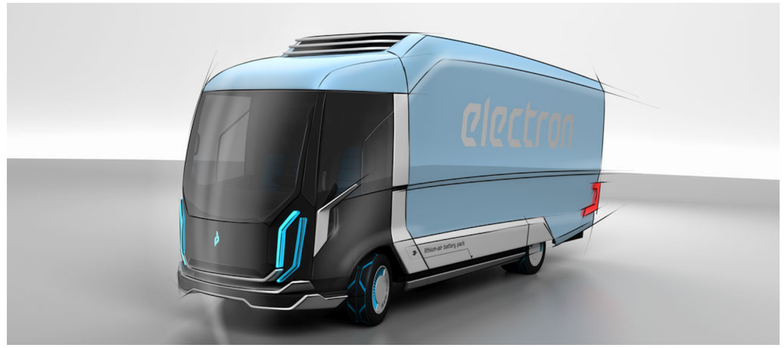
KEY COMPETENCES

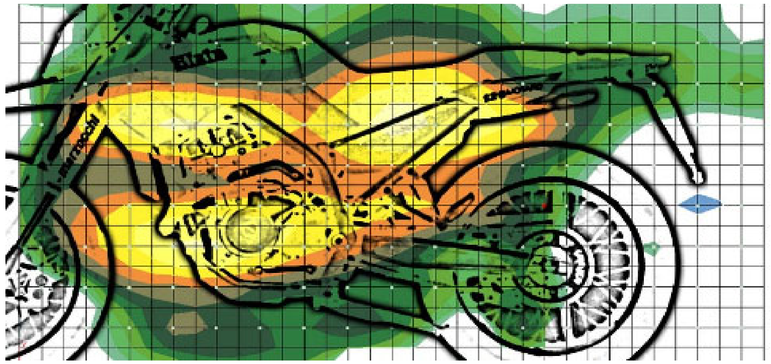
Tribology

Biotribology

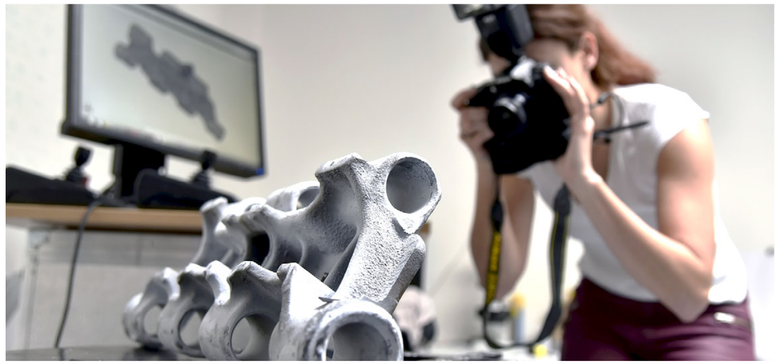


Industrial Design

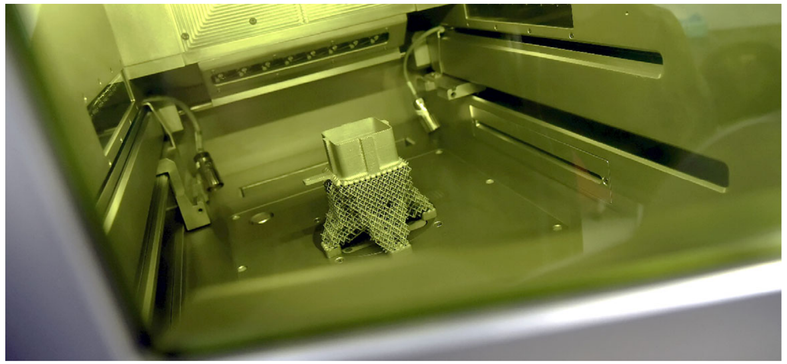




Condition Monitoring and Vibroacoustics



3D Digitization and Reverse Engineering



Metal 3D Printing

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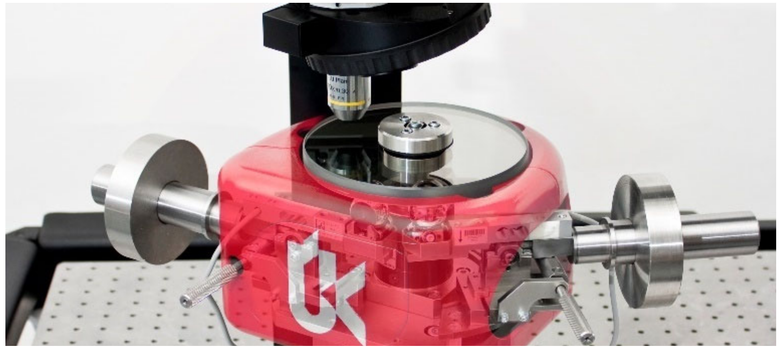
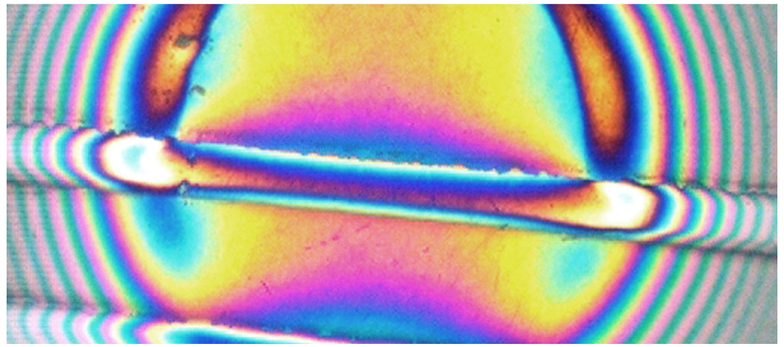
TRIBOLOGY

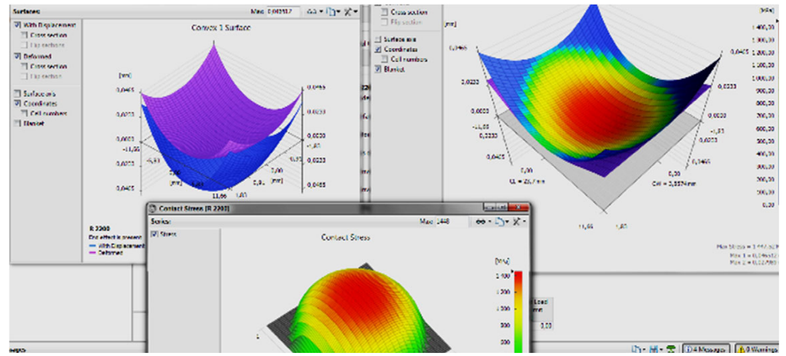
Elastohydrodynamics

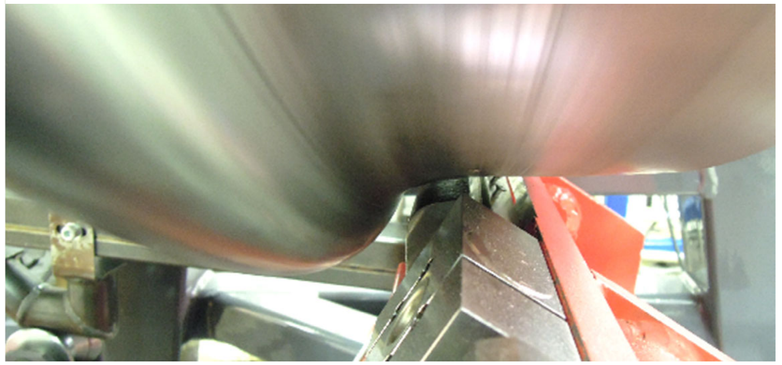


Thin Film Lubrication

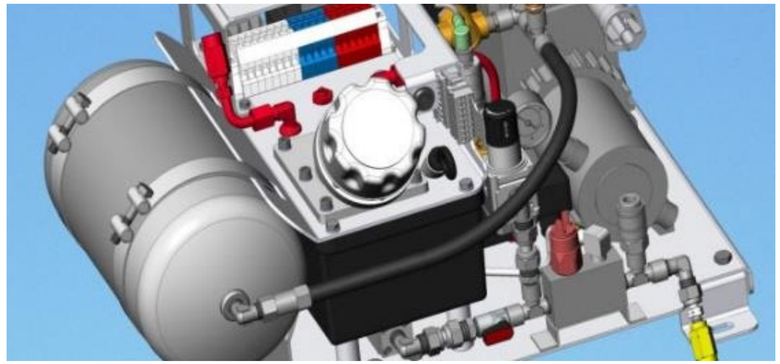


Computing Tools

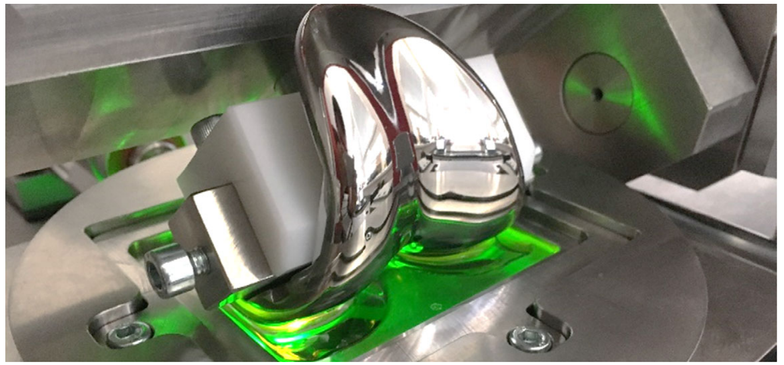




Rail Transport



Lubrication Systems



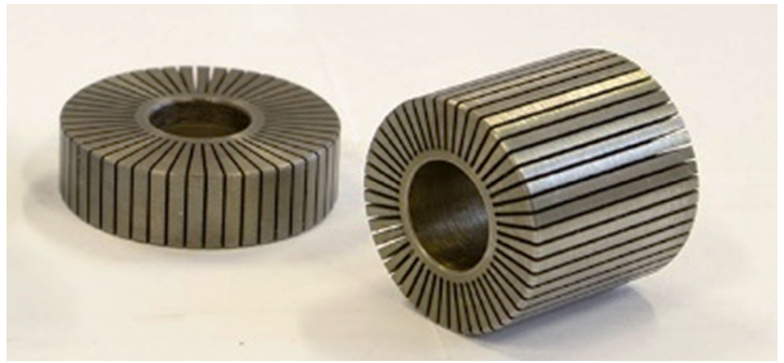
Friction and Lubrication of Artificial Joints

CONDITION MONITORING

Magnetorheological devices

Noise Source Localization

Development of Diagnostic Devices



Research of Magnetorheological Elements

Expert Based Analyses

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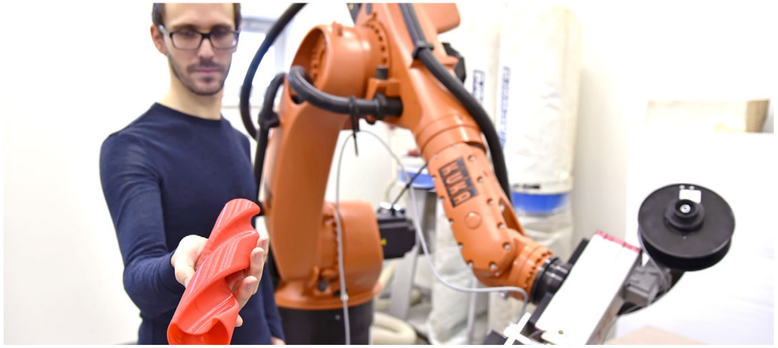
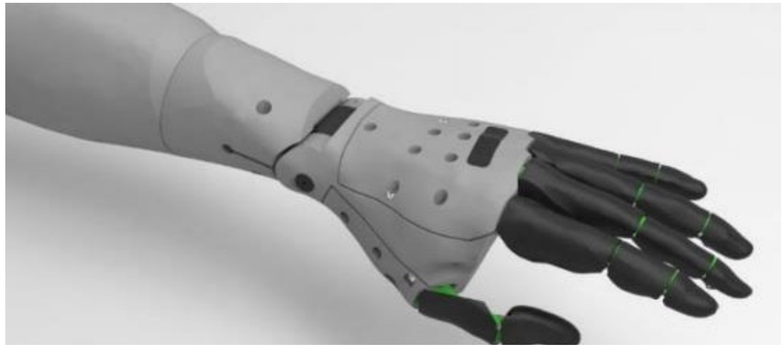
REVERSE ENGINEERING AND ADDITIVE TECHNOLOGIES

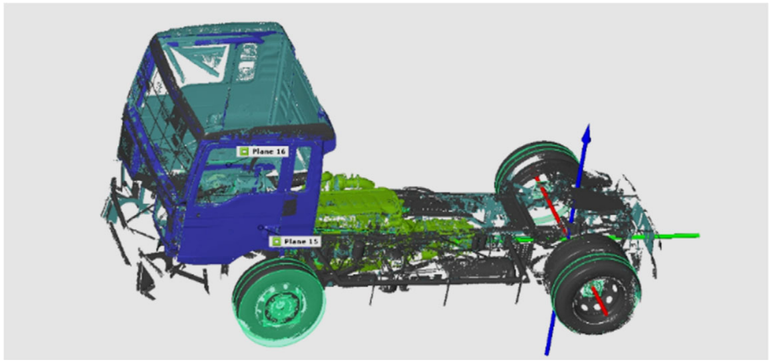
Quality Control in Manufacturing

Robotic Machining of Large Scale Components

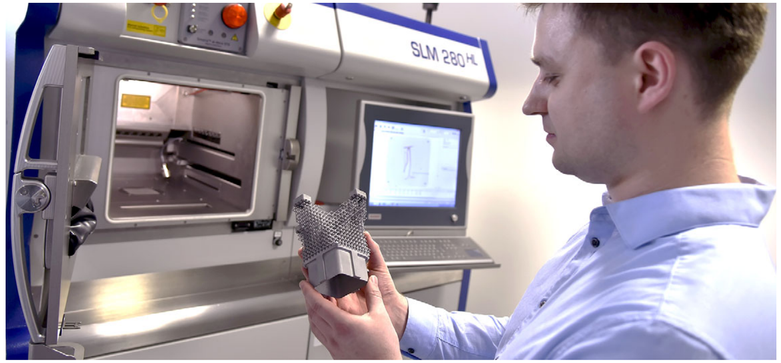


Rapid Prototyping in Prosthetics





3D Optical Digitization



Additive Manufacturing of Metal Parts

Mechanical Engineering Design

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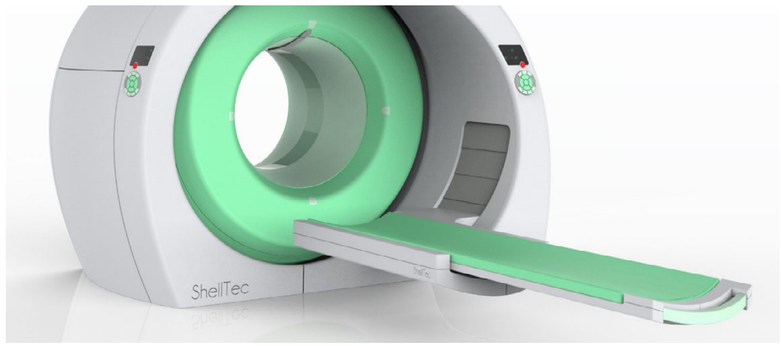
INDUSTRIAL DESIGN

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

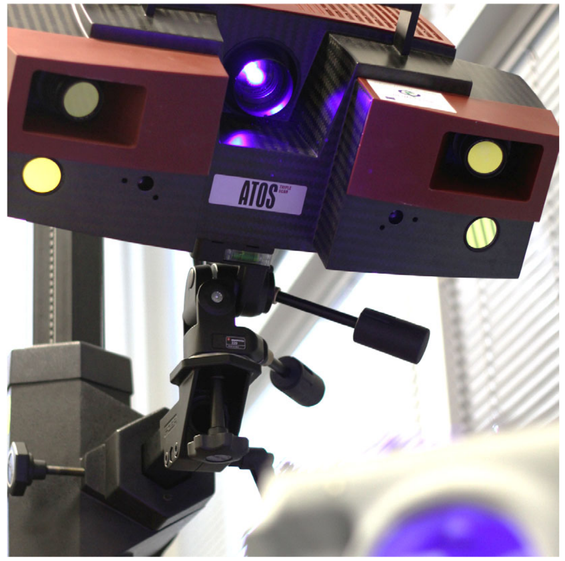
- **18** students
- **8** optional courses, **160** h of lectures

DEGREE PROGRAMME: MECHANICAL ENGINEERING DESIGN

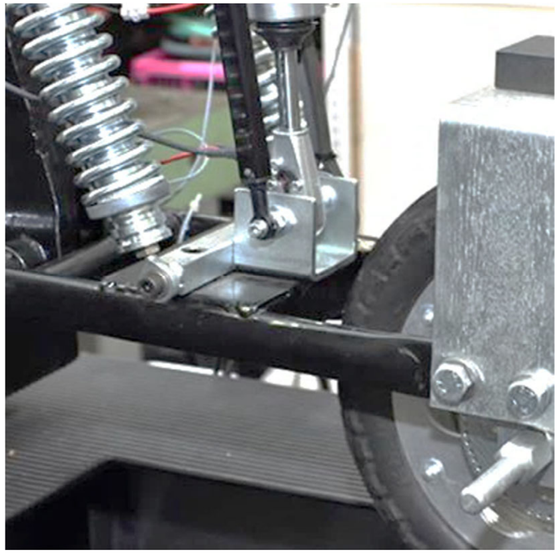
- Project-oriented and research-oriented teaching
- Solving of multidisciplinary projects
- Engineering approach

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

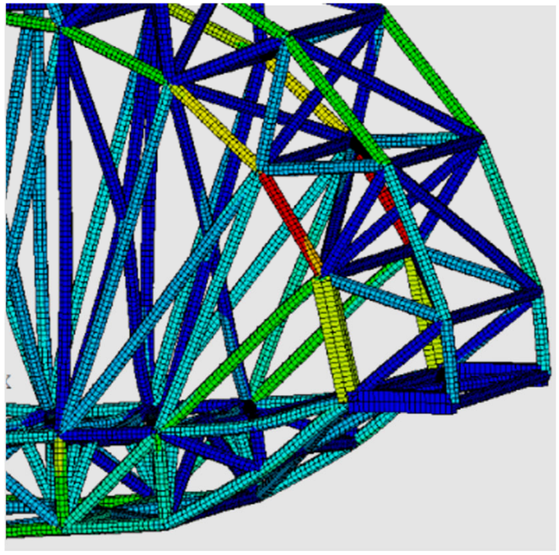
3D DIGITAL TECHNOLOGIES



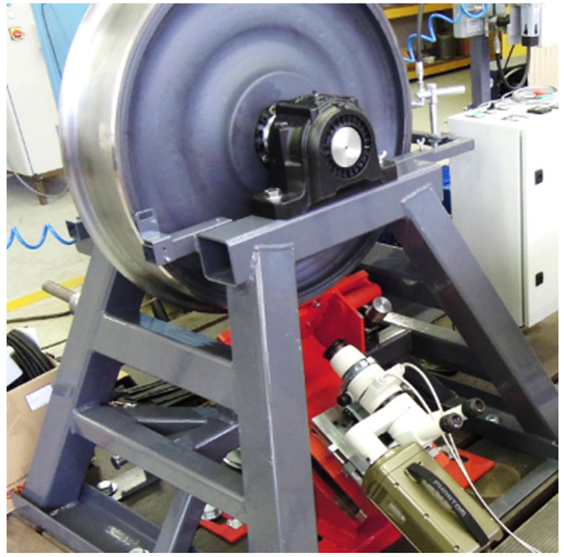
CONDITION MONITORING



ENGINEERING ANALYSES AND SIMULATIONS



TRIBOLOGY



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DEGREE PROGRAMME: INDUSTRIAL DESIGN

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

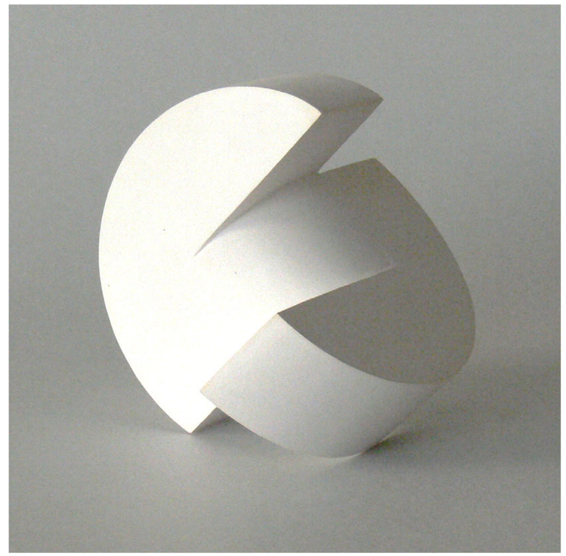
- Emphasis on creativity, aesthetics and ergonomics
- Combination of artistic and technical approach
- Workshops with industrial partners

PRODUCT DESIGN

ERGONOMICS

3D MODELLING, VISUALIZATION, ANIMATION

ARTISTIC TECHNIQUES AND MODELMAKING

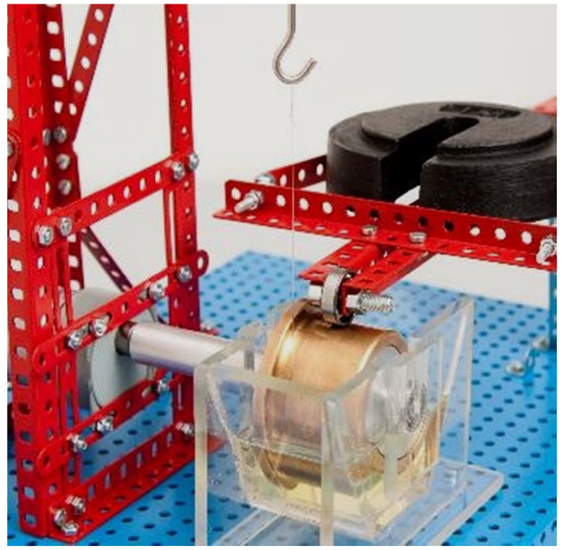


PROJECT-ORIENTED TEACHING

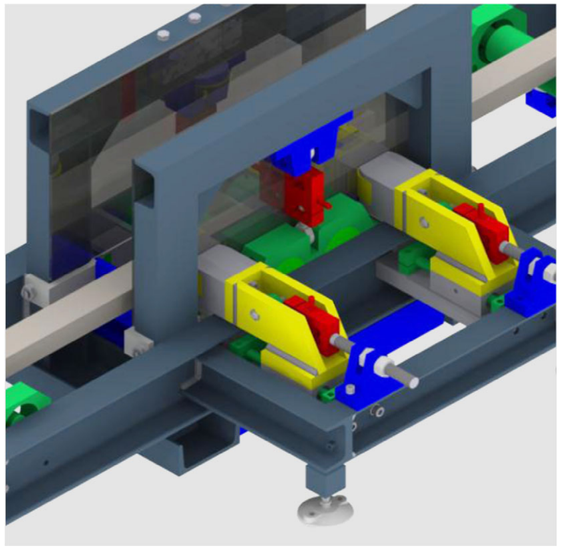
- Block teaching of theory
- Comprehensive multidisciplinary projects
- Focus on real outcomes

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

1st SEMESTER
4 simple team projects

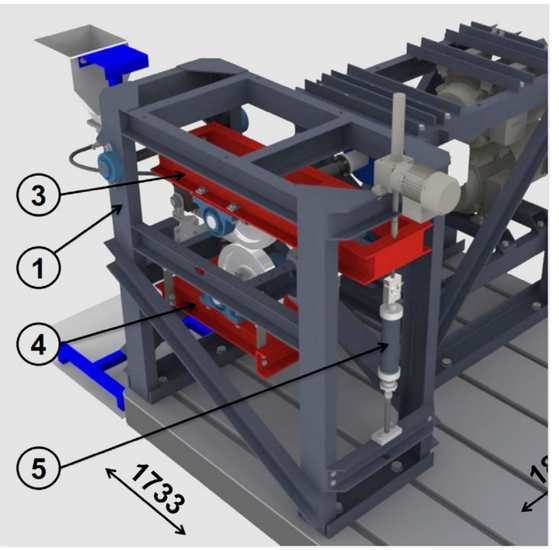


2nd SEMESTER
2 advanced design projects



3rd SEMESTER
1 demanding engineering project

4th SEMESTER
Diploma thesis project



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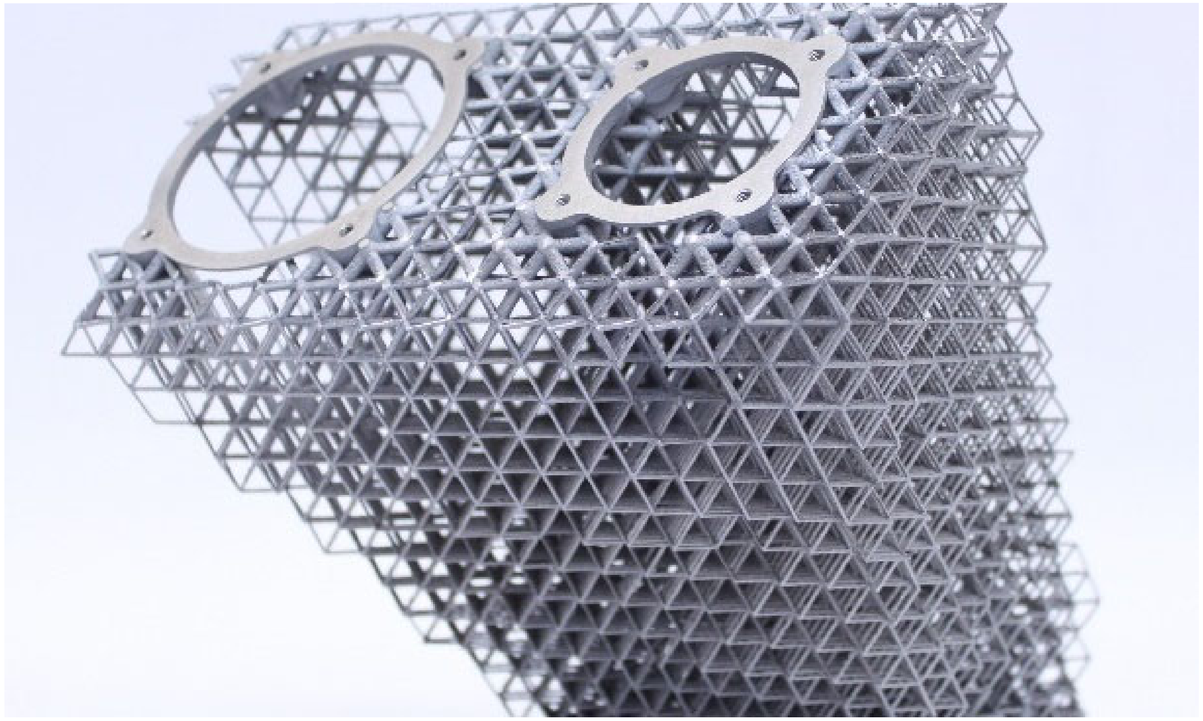
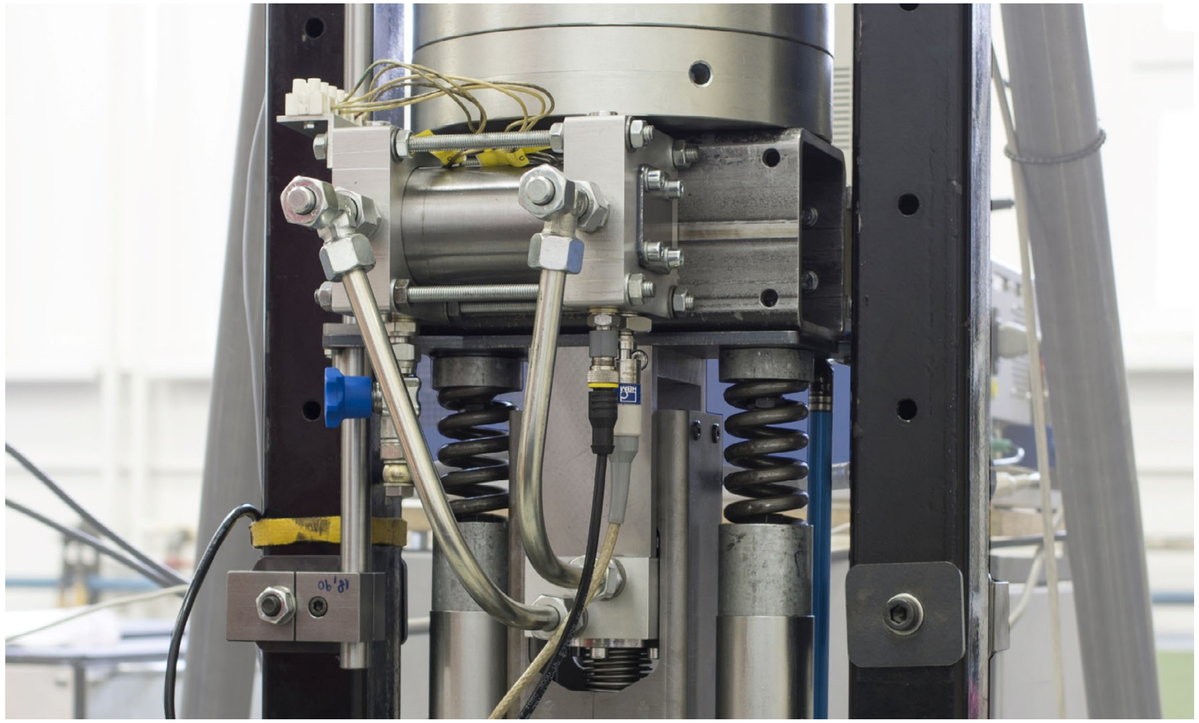
COOPERATION WITH INDUSTRY



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

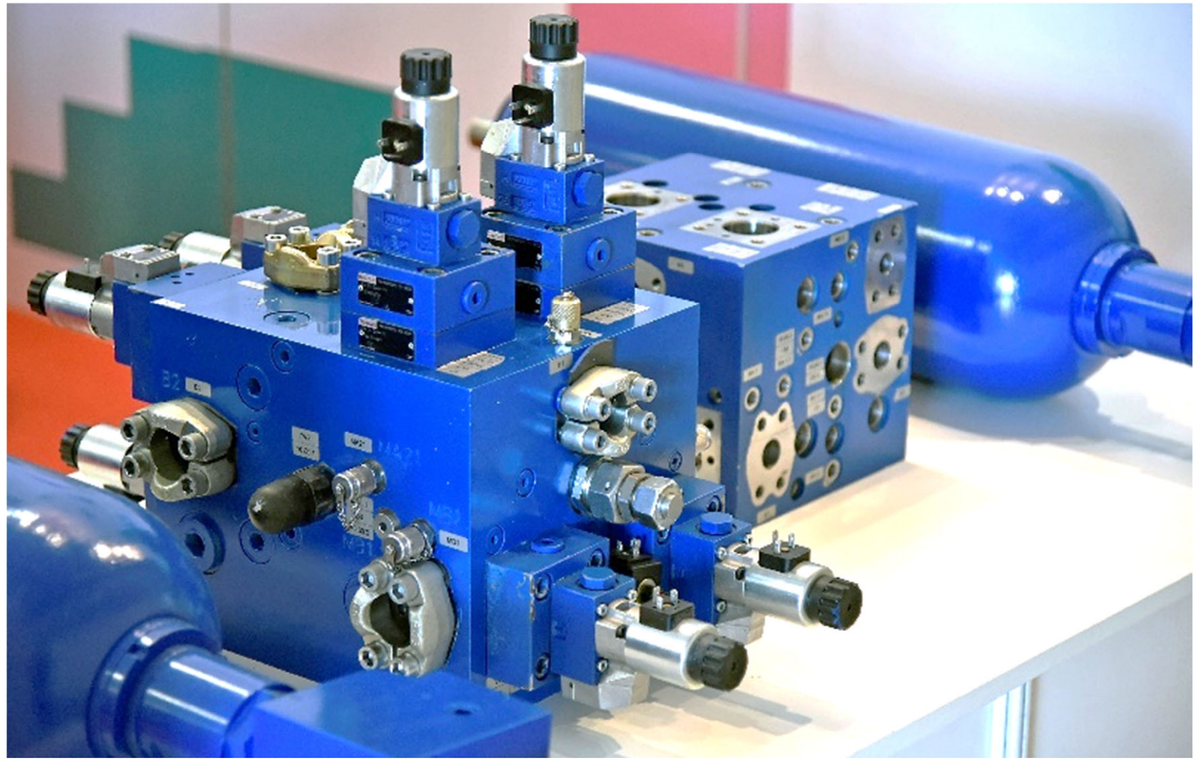


Semi-actively damped strut for vibration isolation of payload of Ariane 6 launcher

COOPERATION WITH INDUSTRY

DAIDO METAL

Development of experimental device for testing of journal bearings



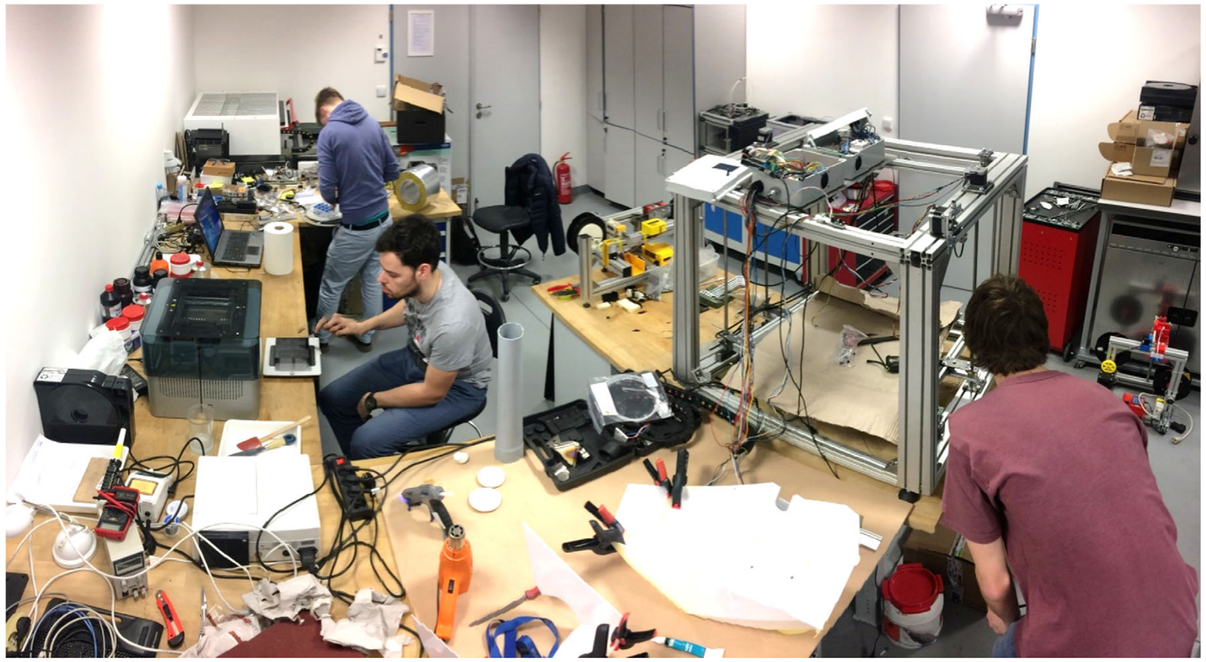
Rexroth
Bosch Group

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

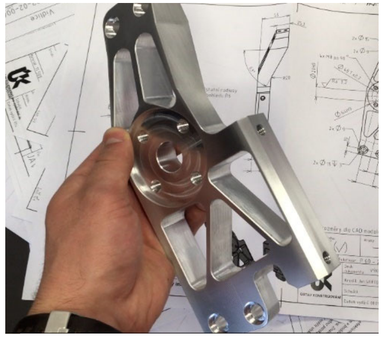
DEVELOPMENT OF STUDENT RACING VEHICLE POWERED BY COMPRESSED AIR

- 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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