



**FACULTY
OF MECHANICAL
ENGINEERING
CTU IN PRAGUE**

Master study programme

Automation and Instrumentation Engineering



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Why to study automation at faculty of mechanical engineering

Industry 4.0 = automation + industrial informatics

- You will understand the machines and processes also from mechanical point of view (construction, mechanisms, stiffness and elasticity, sensors, control,...)
- You will know how to use a control system and how to apply it
- If required, you will be able to design a unique control or measurement system

Control should be designed by someone who understands the system



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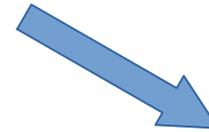
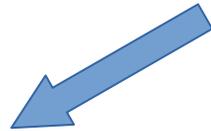
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programme

**Automation and Instrumentation
Engineering**

specializations



**Automation and Industrial Informatics
AI**

**Instrumentation Technology
IT**

more control and programming

more mechanics and construction



Automation and Instrumentation Engineering

Topics in the common part:

Control Algorithms
Programming (PLC, Microprocessors)
Sensors
Artificial Intelligence
Machine Perception and Image Analysis

Projects

two subjects per semester

specialized subjects All

specialized subjects IT



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Automation and Industrial Informatics

Pneumatic and Hydraulic Drive Systems
Object Oriented Programming

Industrial Communication Systems
Database and Knowledge-based Systems

SCADA Systems
Signal Processing and System Identification

Design of Information Systems
Optimal and Predictive Control Systems



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Instrumentation Technology

Technical Optics
Instrument Design 1

Wave optics
Nanotechnology

Finite Element Method I
Design of Optomechanical Instruments

Instrument design 2
Measurement and Experiment



Project classes

We emphasize

- practical work in the labs
- project classes - from 2th semester work on a selected topic that may be related with diploma thesis (Project I, II,III)



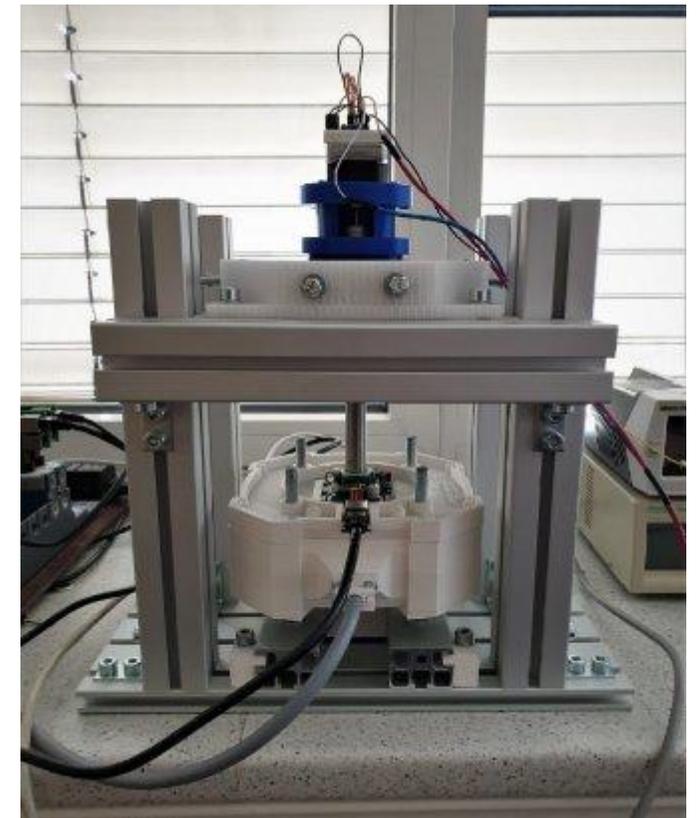
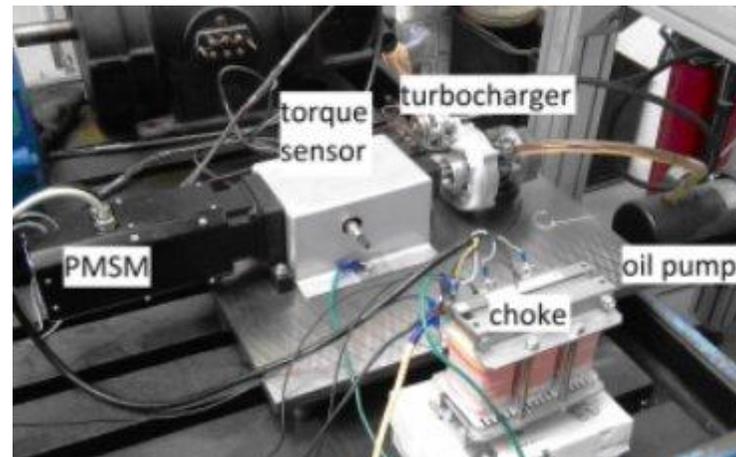


Participation in projects

You can take part in research or student projects

=>

- you will get a scholarship
- can later be part of a diploma thesis

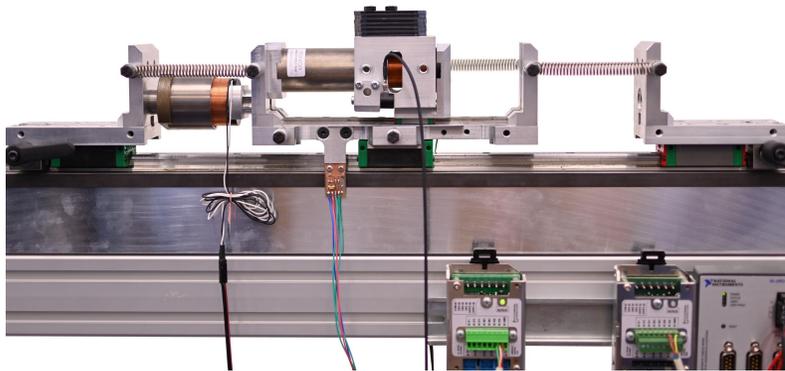




Examples of student projects that you can join

Modelling and control of complex systems - contact [Dr. Bušek](#)

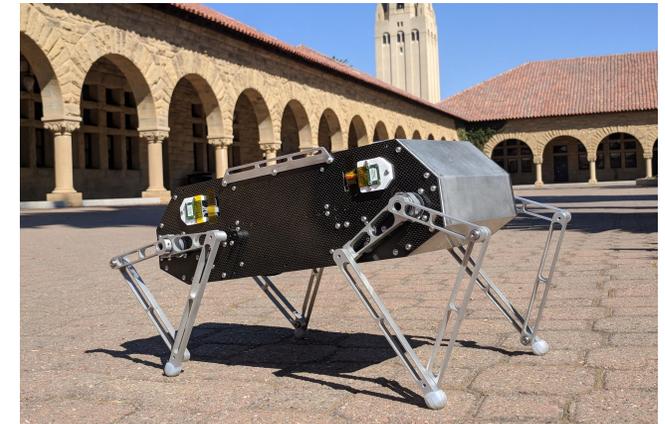
- focused on theoretical description of the dynamic system with further experimental verification
- several topics → you can also choose your own



vibration damping



control of UAVs



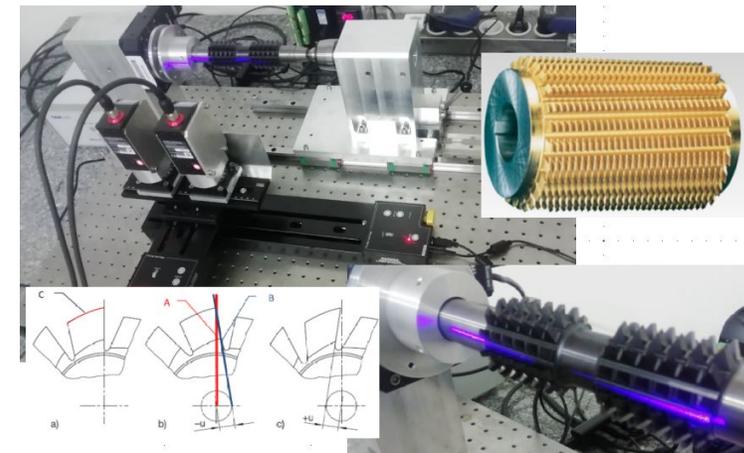
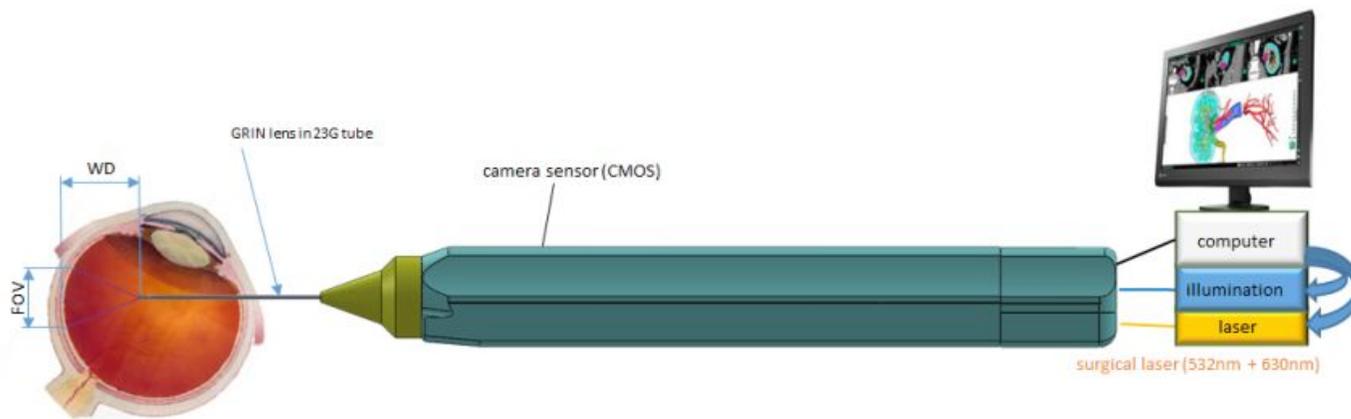
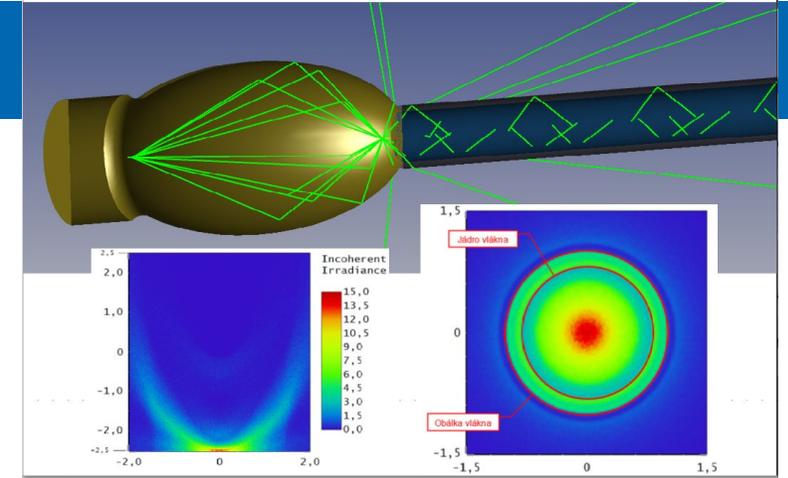
walking robots [<https://techcrunch.com/>]



Examples of student projects that you can join

“Precision mechanical” projects - contact [Doc. Hošek](#)

- eye endoscope
- laser pumping
- LED coupling into fiber optics
- Measurement of hobbing machine tools





Examples of student projects that you can join

High speed electrical generator with a RC hobby turbine - contact [Dr. Z. Novák](#)

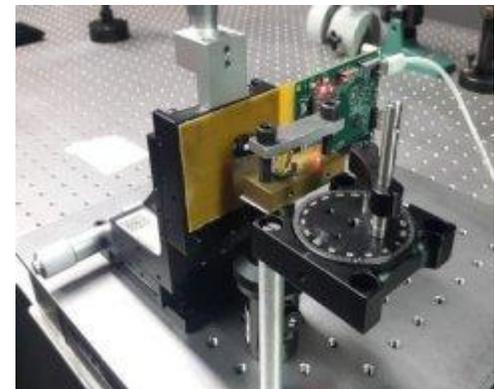
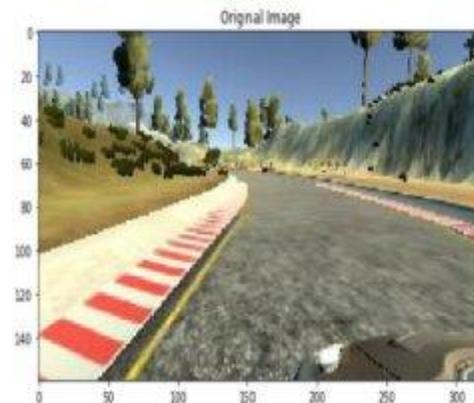
- You can select a topics - from construction (coupling, testbench), modeling (generator, rotordynamics), control (electric machine), programming (DSP, FPGA)
- Smell the fuel and high speed and make you knees shiver





Examples of diploma theses

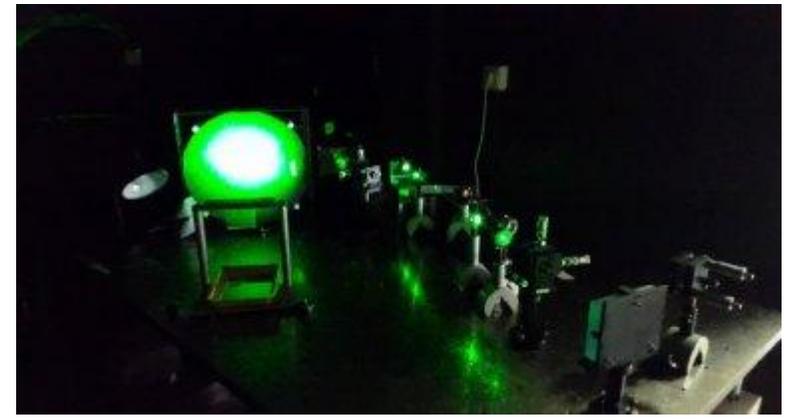
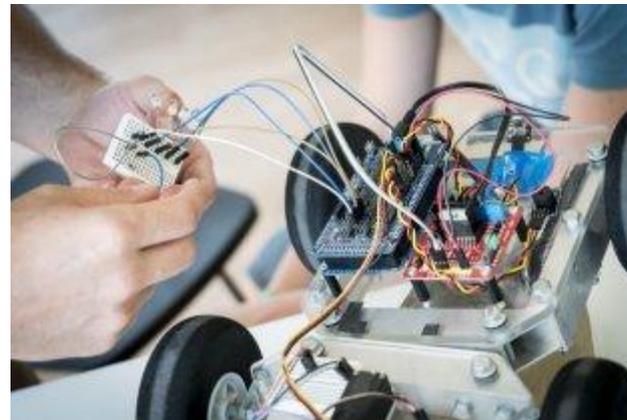
- Control design and implementation of a laboratory quadcopter-cart system with a suspended load
- Car assistant system for road lanes and traffic signs detection
- Control of active radial magnetic bearing
- Laboratory model of delta robot
- Smart glasses





Graduate profile = what can you do

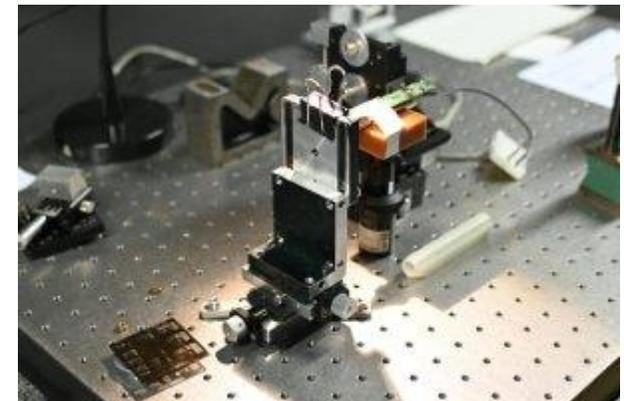
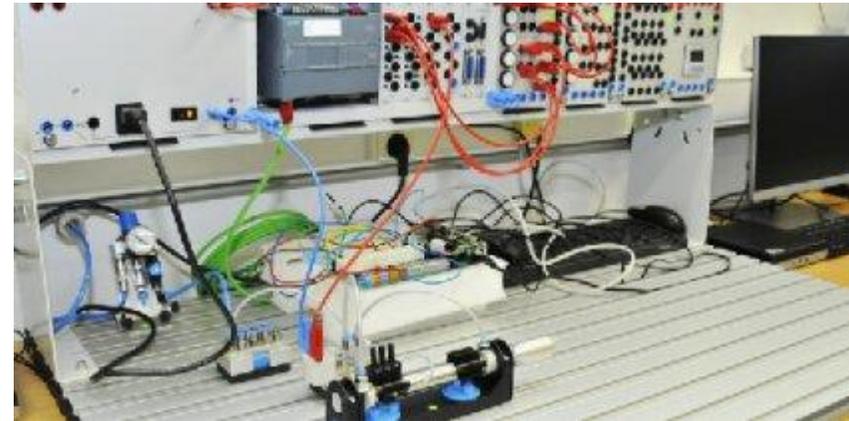
- Design and programming of assembly or manufacturing lines and robots
- Control systems programming
- Software design
- Design of unique instruments





Our labs

- Automatic control
- Programmable controllers
- Micromanufacturing
- Wave optics
- Electronics and Electrical Machines
- ...





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Our labs

- Virtual lab tour here

<https://poly.google.com/u/0/view/0LILXAhcCGr>





Presentation of a first year student – Kengo Nagashima



- The study field based on mechanical engineering is highly demanded recently
- Supportive and experienced teachers
- Wide choices of research topics you could be interested in



Bachelor's thesis: **Design of a Quadrotor**

Master's thesis: **Design of a Hybrid Hexacopter with a RC Engine Generator and LiPo Batteries**



DJI Matrice 600 Pro



MAX-120AX RING



Antigravity 8014 KV100





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Presentation of a first year student – Prem Wongsagoon



- Hardware + Software = Controlling Engineer
- High demand in the employed market with high income
- Transportation, industrial process and etc.





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We give life to machines

Time for questions