



# RESEARCH HIGHLIGHTS

## of the Czech Technical University in Prague

Professor Petr Konvalinka, Rector

Czech Technical University in Prague



# CTU in Prague

= technical university established in baroque time (1707)

- best ranking technical university in the country
- 8 faculties
- 110 (in Czech) and 70 (in other languages) study programmes
- 23 000+ students (2 966 international students)
- 1 900 academic staff
- 1 500 non-academic

QS World University Rankings 2014:  
rank 411–420

- Engineering and Technology rank 173
- Natural Sciences rank 135







## Did you know that in 2013...

- we made 48 applications for inventions, 2 European applications, 1 Japanese patent?
- we made 122 applications for utility models and one application for a trademark?
- we supported a total of 372 grants with funding from the Student Grant Competition (including 53 student scientific conferences), and that the total amount of funding awarded was in excess of 120,8 million Czech crowns?
- more than 700 scientific and research projects are in progress at CTU?



# 1. Centre for Effective and Sustainable Transport Infrastructure (CESTI)

is focused on technical innovations aimed at elimination of deficiencies in today's transport infrastructure.

[www.cesti.cz/index.php?en=en](http://www.cesti.cz/index.php?en=en)

**Project Manager: prof. Alena Kohoutková**  
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**Project Secretary: Petr Bílý**  
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## 2. Advanced Technologies for Heat and Electricity Production

is focused on applying the latest knowledge in the field of heating, characteristics of fuels, efficiency of equipment, reducing self-consumption and optimization of distribution networks.


<http://fluids.fs.cvut.cz/www/en>


Principal investigator: prof. Jiří Nožička  
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e-mail: jiri.nozicka@fs.cvut.cz



### 3. Centre for Applied Cybernetics (CAK)

is aimed at basic, applied, and industrial research in the field of cybernetics, and the subsequent industrial realisations.

 [www.c-a-k.cz/?go=hp&id=&lang=en](http://www.c-a-k.cz/?go=hp&id=&lang=en)

 [www.c-a-k.cz/?go=galerie&lang=en](http://www.c-a-k.cz/?go=galerie&lang=en)

**Principal Investigator and Head: prof. Vladimír Kučera**  
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**Secretary: Monika Hübnerová**  
phone: +420 224 357 611  
e-mail: [m.hubnerova@c-a-k.cz](mailto:m.hubnerova@c-a-k.cz)

## 4. Center for Large Scale Multi-modal Data Interpretation

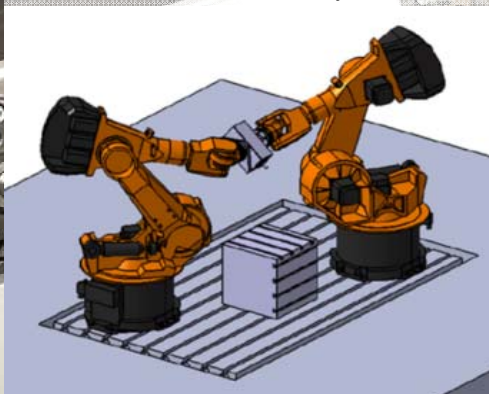
comprises internationally-recognized groups possessing cutting edge expertise in exploiting large collections of unlabeled multi-modal data, mainly video footage, further state-of-the-art in video, audio and natural language understanding, interpretation, annotation and retrieval by combining unsupervised and semi-supervised learning.

Principal investigator: **prof. Jiří Matas**  
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e-mail: [matas@fel.cvut.cz](mailto:matas@fel.cvut.cz)



## 5. Cooperating robots for improved manufacturing capabilities

The single robots have limited manufacturing capabilities because of limited accuracy and stiffness compared with machine tools. This can be significantly improved by the cooperation of two or more robots where several concepts from mechanics, mechatronics and control were combined.



[www.1url.cz/F4UM](http://www.1url.cz/F4UM)

Principal investigator: prof. Michael Valášek  
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e-mail: michael.valasek@fs.cvut.cz



## 6. Center for Machine Perception

is a university research center performing fundamental and applied research in computer vision, robotics, machine learning, pattern recognition, and mathematics.



<http://cmp.felk.cvut.cz>

**Principal Investigator:** prof. Václav Hlaváč  
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e-mail: hlavac@fel.cvut.cz



## 7. Advanced sensors and sensor data processing methods

The centre will develop advanced sensors and methods for sensor data processing for wide area of industrial applications for navigation in aerospace and railway, and sensor technologies for building health monitoring.

 <http://measure.feld.cvut.cz/en/home>

**Principal Investigator: Ass. prof. Antonín Platil**  
phone: +420 224 353 954  
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## 8. Josef Bozek Research Centre of Engine and Automotive Engineering

is focused in development of spark ignition engines (gasoline, gas, alternative fuels) and diesel engines for cars and heavy-duty vehicles. The Centre is an official partner of Gamma Technologies, Inc., the leader in specialized engine simulation software.

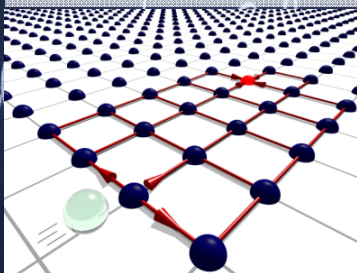
[www.1url.cz/h4UW](http://www.1url.cz/h4UW)

Principal Investigator: prof. Jan Macek  
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e-mail: Jan.Macek@fs.cvut.cz



## 9. Doppler Institute for or Mathematical Physics and Applied Mathematics

its mission is to create a first class research center in the field of mathematical physics and applied mathematics with the horizon of one generation and strong ties to leading European institutes.



Andreas Schreiber et al.: A 2D Quantum Walk Simulation of Two-Particle Dynamics, Science 336, 55 (2012); DOI: 10.1126/science.1218448

<http://doppler.ujf.cas.cz>

Principal Investigator: prof. Igor Jex  
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# 10. Human-Computer Interaction Group

**Navigation system NaviTerier for vision-impaired people:** The project consists of a design and implementation of a system for an in-door navigation of vision-impaired people using mobile telephones.

**Input devices for people with motor impairments:** We develop dedicated techniques of analysis of sound and bio-signals that we use to control the emulators of standard input devices. Examples of our applications include computer games controlled by voice and entering text via processing of the myoelectric signals.

<http://dcgi.felk.cvut.cz>

Principal Investigator: prof. Jiří Žára  
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e-mail: office@dcgi.felk.cvut.cz



# 11. Solar Decathlon 2013

Visitors line up to tour the house built by students from the Czech Republic's Czech Technical University following the announcement of their overall third place victory in the U.S. Department of Energy Solar Decathlon 2013 at the Orange County Great Park in Irvine, Calif., October 12, 2013).



 [www.solardecathlon.gov](http://www.solardecathlon.gov)



## 12. Optimization of artificial lung ventilation

The research objective is searching such artificial lung ventilation modes which minimize the undesirable effects on the patient's lungs. Patients with obstructive lung diseases may breath spontaneously even in cases where they would not be able of spontaneous ventilation.

 [www.1url.cz/F4UE](http://www.1url.cz/F4UE)

Principal Investigator: doc. Ing. Karel Roubík, Ph.D.  
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## 13. Klokner Institute

provides expert services for the state administration and for private clients in the field of national and international standardization in civil engineering. The institute plays a key role in developing international collaboration in R&D.



[www.klok.cvut.cz/en](http://www.klok.cvut.cz/en)

Director: Ass. prof. Jiří Kolísko  
e-mail: [jiri.kolisko@klok.cvut.cz](mailto:jiri.kolisko@klok.cvut.cz)



# 14. Institute of Experimental and Applied Physics (IEAP) of CTU

is performing research in physics of quantum world and its applications.



[www.utef.cvut.cz/en/index.php?&Ns=104](http://www.utef.cvut.cz/en/index.php?&Ns=104)

Director: Dr. Stanislav Pospíšil  
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