



European
social fund in the
Czech republic



EUROPEAN UNION



MINISTRY OF EDUCATION,
YOUTH AND SPORTS



OP Education
for Competitiveness

INVESTMENTS IN EDUCATION DEVELOPMENT

European Social Fund in the Czech Republic – Ministry of Education, Youth and Sports of the Czech Republic – Czech Technical University in Prague

OPEN POSITIONS FOR PH.D. GRADUATES (POST-DOCS) AT THE CZECH TECHNICAL UNIVERSITY IN PRAGUE IN THE FIELD OF VEHICLE POWER TRAIN AND POWER MANAGEMENT MODELLING AND CONTROL

Project OP VK CZ.1.07/2.3.00/30.0034

Support of research teams at Czech Technical University in Prague.

Duration: July 1, 2013 - June 30, 2015.

The Czech Technical University, Faculty of Mechanical Engineering (CTU) <http://www.fs.cvut.cz> is looking for recent doctoral study graduates¹ focused on the simulation and optimization of vehicle powertrains and predictive control of power systems.

CANDIDATE PROFILE: All candidates must be fluent in spoken and written English. A candidate has a Ph.D. degree (or equivalent) in mechanical engineering or physics and an adequate mathematical background. The maximum time after graduation is 5 years¹. He or she published at least one journal paper impacted and registered by WoS.

Specific topics of research and mentors:

Prof. Ing. Jan Macek, DrSc.,

<http://fsinet.fsid.cvut.cz/en/u2201/PERSONNEL/macek/> or
<http://bozek.cvut.cz>

The methods of optimization by simulation (assessment combining 0-D, multibody, 1-D and 3-D methods) **and experiments applied to**

1. standard and hybrid/power-splitting powertrains operation efficiency concerning real driving conditions and pollutant/NVH emissions.;
2. new concepts of engines concerning advanced combustion systems, including the use of alternative fuels with good efficiency and low pollutant/NVH emissions;

3. new concepts and models of turbocharging and supercharging components and engine charge exchange.

Prof. Ing. Michal Takáts, CSc., <http://www.fs.cvut.cz>

The methods of experiments and simulations applied to

4. development of methods and combustion systems including pollutant formation in ICE powertrains under real driving conditions;
5. development of methods for experimental research and optimization of components of turbo/superchargers and engine charge exchange.

Experience-based semi-empirical methods will be calibrated by detailed simulations at higher level of modeling.

Prof. Ing. Michael Valášek, DrSc., <http://www.fs.cvut.cz>

6. **knowledge support of engineering design and automated design** in vehicles;
7. **model based predictive control** for nonlinear and adaptive control of nonlinear systems of **combustion engines, powertrains and integrated vehicle chassis**;
8. **model based nonlinear predictive control** with constraints for generally underactuated nonlinear systems in **mechatronic vehicle systems and integrated chassis control** of vehicles;
9. **model based nonlinear predictive control** with constraints for hierarchical control of **distributed/decentralized (passive renewable/ active fuel) energy resources „smart grids“** for energy efficient buildings.

The topics should be selected preliminarily by the candidate.

Additional requirements on candidates:

- Proven abilities of publishing the results of R&D are the most important criterion for applicant's assessment.

¹ Graduation between March 29, 2008 and the date of admission. Studies took place at Czech or foreign universities.



europa
social fund in the
czech republic



EUROPEAN UNION



MINISTRY OF EDUCATION,
YOUTH AND SPORTS



OP Education
for Competitiveness

INVESTMENTS IN EDUCATION DEVELOPMENT

European Social Fund in the Czech Republic – Ministry of Education, Youth and Sports of the Czech Republic – Czech Technical University in Prague

- Specific experience with CAE simulation methodology (Finite Element Method (FEM), Computational Fluid Dynamics (CFD) or Multi-Body Simulation (MBS) in connection to CAD (Creo or Pro/Engineer, Catia v5) is an advantage.
- Specific experience with CAE simulation software (FIRE, GT Suite, Fluent) is an advantage.
- Expertise with multi-domain system modeling (behavioral 1D up to detailed 3D) and/or multi-attribute optimization is an asset.
- Knowledge, experience and skills in the field of experimental investigation of combustion engines and motor vehicles are an advantage.
- Knowledge of programming languages (Fortran, VisualBasic, C++) and/or knowledge of Matlab are an advantage.

Conditions:

- the contract with the employee will be valid for the period since date of admission (at the earliest 1st July 2013) till 30th June 2015;
- the research activities will be carried out at the Czech Technical University, Josef Božek Research Centre located in Roztoky (<http://www.vtp-roztoky.cz>) suburb of Prague, Czech Republic;
- the employee will take part in teaching activities in the range of 3-5 hours/week;
- gross salary of at least 43 000 Czech Crowns (CZK) – approx. 1650€, well above the national average salary (1000€); social and health insurance paid by the employer; possible increase in case of excellent results after the first 6 months; the result assessment depends on contribution to publishing activities of research teams;
- paid business trips to present the results at one or more congresses or conferences annually ;
- paid, minimum of 3 months practice in industrial R&D in the Czech Republic or abroad (e.g., Škoda Auto, Porsche Engineering Services

Prague, AICTA Design Works, Ricardo Prague, Honeywell Turbo Technologies, etc.);

- possibility to continue employment and academic carrier after the end of the project, especially in case of successful grant applications.

The employer will help participants of the project in finding accommodation, if necessary.

APPLY NOW! Targeted Start Date: July 1, 2013 or later. The application are accepted since June 20, the application deadline for the 1st turn of assessment is June 17, 2013, till 24:00.

The assessment committee meetings will be held on June 24 and 28, 2013. The results of preliminary application assessment with the list of candidates eligible for the final assessment will be announced at <http://bozek.cvut.cz> on June 25. The final assessment, during which the interview with present or skype contacted candidate may be required, will take place on June 28.

Altogether, 7 full-time candidates may be employed (at least 4 graduates from universities other than CTU). In case the accepted candidates will not use the full budget resources planned the tender for vacant positions will be repeated after September 2013.

To apply, please send by e-mail and (followed) by a letter, **which both should reach contact person at CTU in Prague till June 17, midnight:**

1. a **detailed CV in English or Czech, at least one page A4 (including list of published papers with the full bibliographic data and**



europa
social fund in the
czech republic



EUROPEAN UNION



MINISTRY OF EDUCATION,
YOUTH AND SPORTS



OP Education
for Competitiveness

INVESTMENTS IN EDUCATION DEVELOPMENT

European Social Fund in the Czech Republic – Ministry of Education, Youth and Sports of the Czech Republic – Czech Technical University in Prague

impact factor of the journal according to WoS, patents and realized engineering works – applicants with better publication activities will be preferred);

2. a letter of motivation in English or Czech stating the selected # of topics mentioned above and commenting details of your intentions in doing that research;
3. copy of your certificate of English language knowledge (e.g., CAE or TOEFL or electronic version of PhD. Thesis in English);
4. copies of your master and Ph.D. diplomas;
5. one recommendation letter in English or Czech with the full e-mail and phone contacts to the recommending person.

Additionally (voluntarily),

6. **full-text electronic copies of three of your best published papers/articles.**

Contact person for letters and mail is Ing. Eva Zbožínková

eva.zbozinkova@fs.cvut.cz

Czech Technical University in Prague U 12 201

Technická 4

CZ-166 07 Praha 6

Czech Republic

The full description of tender conditions (including the rules for assessment committee procedure, etc. – in Czech) is exhibited at <http://bozek.cvut.cz>.