

Curriculum vitae

Name	Prof. Ing. Jindřich Petruška, CSc.
Affiliation to BUT	Faculty of Mechanical Engineering, Head of Institute of Solid Mechanics, Mechatronics and Biomechanics
Position in team	Key person

1. Education and academic qualification

- 1981, MSc. , Transportation machines, Faculty of Mechanical Engineering BUT
- 1985, PhD. , Mechanics of Stiff and Deformable Solids and Continua, Faculty of Mechanical Engineering BUT
- 1995, Assoc.Prof. , Mechanics, Faculty of Mechanical Engineering BUT
- 2006, Prof. , Applied Mechanics, Faculty of Mechanical Engineering BUT

2. Career overview

- 1981-1984, PhD study, Faculty of Mechanical Engineering, BUT
- 1983, Researcher, Vitkovice Ironworks
- 1984-1985, Research visitor, University of Wales, Swansea, UK
- 1986-1989, Researcher, Inst. of Solid Mechanics, Faculty of Mech.Eng., BUT
- since 1989, Lecturer, Inst. of Solid Mechanics, Mechatronics and Biomechanics, Faculty of Mech.Eng., BUT

3. Research and development, experience

- Computational evaluation of strength and reliability of structures by FEM, concentrated to modeling of nonlinear effects of material, large deformation and contact. Development of special software for the solution of the following problems:
 - inverse problems of elasticity
 - leveling of long product based on eulerian description of material flow
 - optimization of structures with respect to plastic behaviour
 - simulation of forming based on a rigid-plastic model of material flow
 - computational modeling of ductile fracture of metallic materials
- Publications and other R&D activities:
 - more than 100 research articles in peer reviewed journal papers, conference series and seminar notes (e.g. *Journal of Materials Processing Technology*, *Advances in Materials and Processing Technologies conference series*),
 - about 170 records in RIV – Register of R&D outcomes (peer reviewed journal papers, monographs, chapters in books, function samples etc.).
- Conception maker, proposer and executor of R&D projects.

4. Activities related to R&D (pedagogic activities, supervisor in PhD study)

- Guarantor of master degree programme Engineering Mechanics and Biomechanics.
- Guarantor and lecturer of key courses in bachelor, master and doctoral degree programmes.
- Supervisor in PhD study programme Engineering Mechanics (8 defended Ph.D. theses, 2 current Ph.D. students).
- Member of the Accreditation Commission of the Czech Republic (2012-2016), since 2016 Member of Board of the National Accreditation Agency for University Education, responsible for technical education

5. Relevance and interconnection of current research activities with goals, programmes and activities of the project, potential for successful realization of the project

- Key position in research and teaching activities of the Institute, active part in conceptual development of mechanical engineering study at Brno University of Technology, member of the Scientific Board of the Faculty of Mechanical Engineering BUT, author of more than a hundred of publications in his area of expertise. Research in the area of computational modeling of ductile fracture, consultations and lecturing in the Czech Republic and abroad.

6. Sum of citations (according to WoS) total/without self-citations

172/113

7. h-index:

8 (WoS ResearcherID F-8573-2018)

8 (Scopus, Author ID: 7004256840)

8. 5 most significant results

- PETRUŠKA, J., JANÍČEK, L. On the evaluation of strain inhomogeneity by hardness measurement of formed products. *Journal of Materials Processing Technology*, 2003, roč. 143- 144, č. 12, s. 300, IF 1.8, **35 times cited**
- RUSZ, S., PETRUŠKA, J., JANÍČEK, L. Computationally- experimental workability determination of compressed cylindrical specimen with surface defect. *Journal of Materials Processing Technology*, 1998, roč. 80- 81, s. 572, IF 1.8, **18 times cited**
- PETRUŠKA, J., JANÍČEK, L., MAROŠ, B., RUSZ, S. Cold forming of bolts without thermal treatment. *Journal of Materials Processing Technology*, 2002, roč. 125- 126, č. 1, s. 341, IF 1.8; **15 times cited**
- KUBÍK, P.; ŠEBEK, F.; PETRUŠKA, J.; HŮLKA, J.; RŮŽIČKA, J.; ŠPANIEL, M.; DŽUGAN, J.; PRANTL, A. Calibration of Selected Ductile Fracture Criteria Using Two Types of Specimens. In *Materials Structure & Micromechanics of Fracture VII. Key Engineering Materials*. 2014. s. 258-261 **13 times cited**
- PETRUŠKA, J.; NÁVRAT, T.; ŠEBEK, F. A New Model for Fast Analysis of Leveling Process. *Advanced Materials Research*, 2012, roč. 586, č. 1, s. 389-393 **8 times cited**

9. Publications, monographs and chapters in books (selection)

Five most recent articles in peer reviewed journals:

- ŠEBEK, F.; PETRUŠKA, J.; KUBÍK, P. Lode dependent plasticity coupled with nonlinear damage accumulation for ductile fracture of aluminium alloy. *Materials & Design*, 2018, roč. 137, č. 1, s. 90-107
- SHAYANFARD, P.; ŠANDERA, P.; HORNÍKOVÁ, J.; PETRUŠKA, J.; ŠITTNER, P.; POKLUDA, J. NiTi Self-

expanding Vascular Stent Configuration and Biomedical Interaction with Artery: Finite Element Analysis. In *Solid State Phenomena*. Švýcarsko: Trans Tech Publications, Switzerland, 2017. s. 366-369

- JENÍK, I.; KUBÍK, P.; ŠEBEK, F.; HŮLKA, J.; PETRUŠKA, J. Sequential simulation and neural network in the stress-strain curve identification over the large strains using tensile test. *ARCHIVE OF APPLIED MECHANICS*, 2017, roč. 87, č. 6, s. 1077-1093
- PETRUŠKA, J.; NÁVRAT, T.; ŠEBEK, F. Novel approach to computational simulation of cross roll straightening of bars. *Journal of Materials Processing Technology*, 2016, roč. 233, č. 7, s. 53-67
- ŠEBEK, F.; KUBÍK, P.; HŮLKA, J.; PETRUŠKA, J. Strain hardening exponent role in phenomenological ductile fracture criteria. *EUROPEAN JOURNAL OF MECHANICS A-SOLIDS*, 2016, roč. 57, č. 5-6, s. 149-164

10. Projects and grants (executor or co-executor, selection)

- 2018 - 2021 TA04020806 Vibration stress relieve of large welded structures.
- 2014 – 2017 TA04020806, Selection and implementation of procedures for low-cycle fatigue evaluating of reactor vessels internals including multiaxial stress states.
- 2009 – 2013 GA101/09/1630, Numerical solution of stationary and nonstationary disperse waves propagation in mechanical systems.
- 2009 – 2012 CZ.1.07/2.2.00/07.0406, Introduction of problem based education to mechanical engineering curricula.
- 2009 – 2012 CZ.1.07.2.4.00.12.0030, Cooperative net in Mechanical Engineering.
- 2011 – 2012 FR-TI1/264, Design and realization of a forge manipulator.
- 2011 – 2012 FR-TI3/441, Development of crankshaft shear press with a new drive.
- 2010 – 2012 FR-TI2/010, New design of door-operating mechanism for public transportation.
- 2009 – 2012 FR-TI1/385, Levelling machine for rods and pipes.
- 2009 – 2011 FR-TI1/185, Moveable scrap iron press

11. Patents, applied results and other forms of protection of intellectual property

Technically realized outcomes:

- DŽUGAN, J.; URBÁNEK, M.; JÁNSKÁ, D.; ŠPANIEL, M.; PETRUŠKA, J.; VLČEK, L.; JENÍK, J.; COMTES FHT a.s., Dobřany, CZ: *Jig for multiaxial non-proportional low-cycle testing*, protected solution No.29741 (2016).
- PETRUŠKA, J.; VLK, M.; NÁVRAT, T.; VOSYNEK, P.: CNS 1100; *Loading section of hydraulic scrap iron press*. ŽĐAS, a.s., Žďár nad Sázavou, prototype (2012).
- PETRUŠKA, J.; NÁVRAT, T.; VLK, M.; VOSYNEK, P.: *Moveable scrap iron press CNS 730/190 MTC*. ŽĐAS, a.s., Žďár nad Sázavou, prototype (2011).

12. Cooperation with industry and with other users of outcomes of R&D (selection)

- Successful cooperation in projects and contracts from industry, in the last five years especially with the following partners: ABB s.r.o., ŽĐAS a.s., UNIS spol s r.o., Siemens Electric Machines s.r.o., Slovácké strojírny a.s., Honeywell spol. s r.o., Poličské strojírny a.s., COMTES FHT a.s., Ústav aplikované mechaniky Brno s.r.o. and others

13. Awards and membership in international and national organizations, platforms

- since 2003, Chairman of the local branch and member of the Control Board of the Czech Society for Mechanics

- 2008-2010 Chairman of G1 committee in Universities Development Fund
- 2010-2015 Member of Editorial Board of Engineering Mechanics journal
- since 2012 Member of the IFToMM Czech national committee
- 2012-2016 Member of the Accreditation Commission of the Czech Republic
- since 2016 Member of Board of the National Accreditation Agency for university education

14. Invited talks at major international conferences (selection)

- J. Petruška, P. Kubík, J. Hůlka, COMPUTATIONAL SIMULATION OF DUCTILE FRACTURE, 19th International Conference KONTECH, May 06-09, 2012, Opalenica, Poland