

doc. Ing. Petr Henyš Ph.D.

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Born [Redacted] Personal web: <https://www.researchgate.net/profile/Petr-Henys>

### Education

Ph.D. in Applied Mechanics	Technical University of Liberec (TUL)	2011 - 2016
M.Sc. in Mechanical Engineering	TUL	2008 - 2011
B.Sc. in Robotics and Mechanical Engineering	TUL	2005 - 2008

### Professional Positions

Associate professor	TUL - Institute of New Technologies and Applied Informatics (NTI)	August 2020 - Current
Research Assistant	TUL - Department of Technologies and Structures	Feb 2017 - Jul 2020
Research Assistant	TUL - Department of Applied Mechanics	Feb 2011 - Feb 2017

### International cooperation/research stays

Visiting scholar	Medical University Graz, Graz	Bone density as a random field (prof. Niels Hammer)	September 2020
Biomedical engineer	Katholieke Universiteit Leuven, Leuven	Bone implant stability analysis (prof. Kathleen Denis)	August 2015
Biomedical engineer	Istituto Ortopedico Rizzoli, Italy	Fracture risk prediction of long bones (Dr. Fulvia Taddei)	Feb 2013 - Jul 2013

### Specialization, research interests, and keywords

Computational Homogenization; Multiscale Modelling; Metamaterials; Finite Element Method; Biomechanics of Bone; Estimation of Bone-implant Interface Stiffness; Uncertainty Analysis; Reverse Identification of Material Properties; Gradient-Based Optimisations; Programming Languages and Visualisation # Image Processing and Analysis # Machine Learning # Image Registration & Segmentation

### Selected three publications:

- [1] Henyš, Petr, Enrico Dall'Ara, and Saulo Martelli. "Symmetric normalization algorithm for estimating physiological strain in bones." *European Journal of Mechanics-A/Solids* 111 (2025): 105539.
- [2] Gonzalez Lopez, Marcos, et al. "Spatiotemporal monitoring of hard tissue development reveals unknown features of tooth and bone development." *Science Advances* 9.31 (2023): eadi0482.
- [3] Henyš, Petr, and Michal Kuchař. "BoneDat, a database of standardized bone morphology for in silico analyses." *Scientific Data* 12.1 (2025): 1043.

**Language:** English (B2) ■ **Programming:** Latex, C/C++, Julia, Python ■ **Reviewing for IF journals:** Sci. Rep., Anal. Biomed. Eng., Model. Mechanobio., and others (75+ reviews since 2017, source: [Publons](https://publons.com))

### Participation in research projects

MIT FR-TI1/584: Research on material properties of smart materials, computational simulation and testing of stent, stentgraft and their loading systems (PI ELLA s.r.o) ■ TACR TA0101879: Development of a prototype device for detecting primary stability of hip replacements (PI Beznoska s.r.o) ■ MITFR-TI3/587: research and development of biomaterial and technology for the production of artificial replacements for the treatment of bone defects (PI LASAK s.r.o) ■ MIT FV30270: Development of wheels and brakes for landing gears of small and medium-sized aircraft (PI Jihlavan a.s.) ■ One Month Travel Grant To MedUni Graz. ICM-2020-00474 funded by Aktion Österreich-Tschechien (OeAD). (1.15kEU, PI:Petr Henyš). ■ TAČR Trend FW09020105 Digital biomechanical twin of 3D printed customized bicycle saddle (147kEU, PI: Petr Henyš). ■ GAČR GA24-10862S Data-driven modelling of bone morphology and mineral density (225kEU, PI: Petr Henyš). ■ FY01010005 - Pokročilá optimalizace vývoje ozubených kol s využitím metod umělé inteligence (PI: Lenam s.r.o., MPO/FY, 370kEU)