

# INTRODUCTION OF THE FIRST YEAR Ph.D. STUDENT

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INSTITUTE OF MACHINE  
AND INDUSTRIAL DESIGN

# HOMETOWN

## MOHELNICE

- Olomouc region
- Industrial town

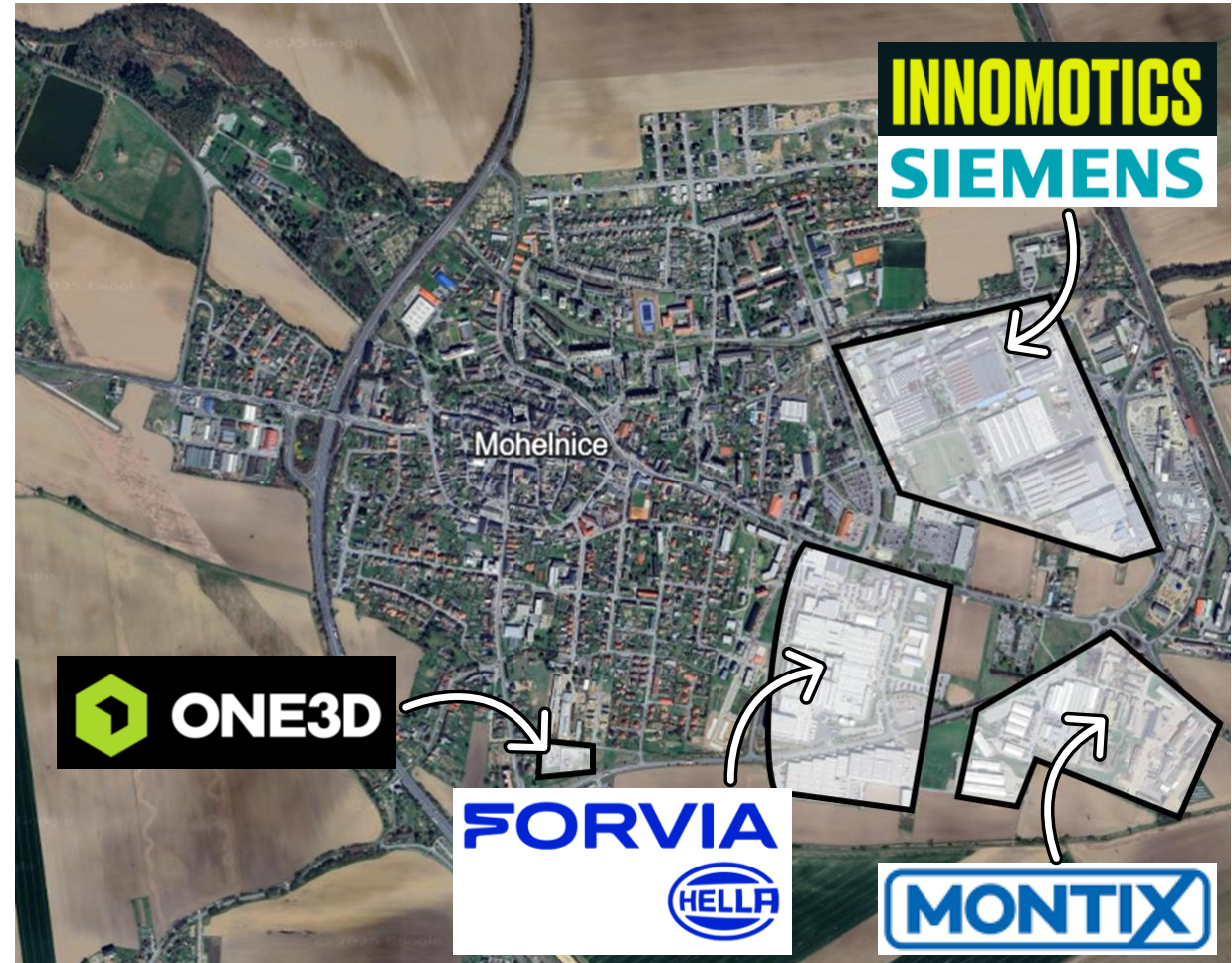




# HOMETOWN

## MOHELNICE

- Olomouc region
- Industrial town





# HOBBIES

## ROAD CYCLING – Especially Alpine passes

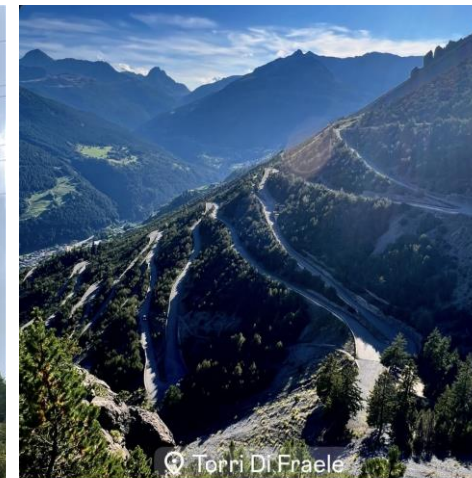


Passo di Gavia



STRAVA

Passo dello Stelvio



Torri Di Fraele





# HOBBIES

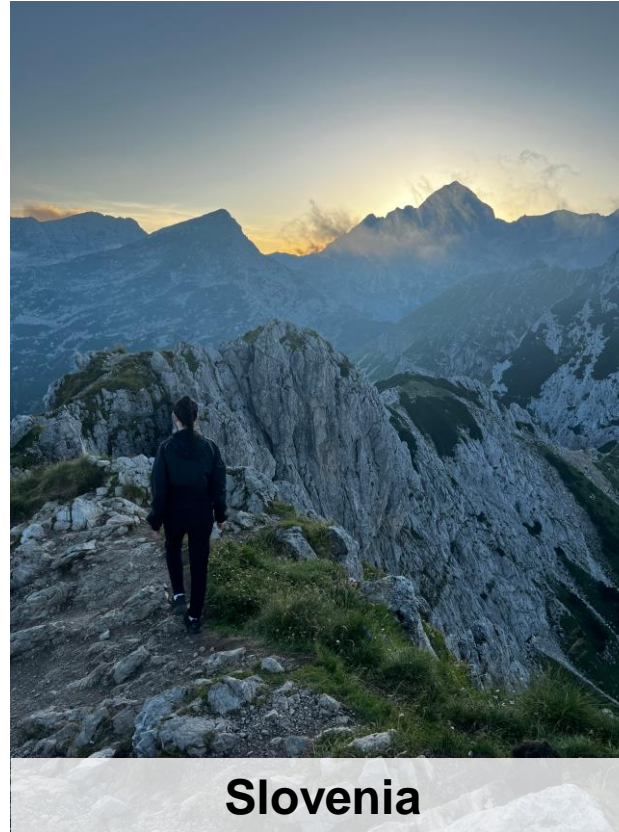
## TRAVELLING



**Austria**



**Morocco**

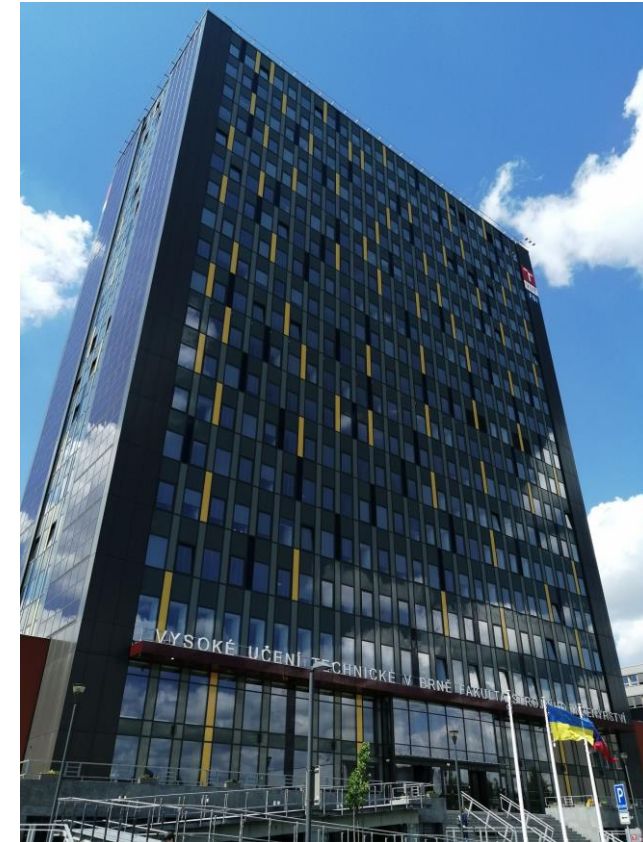
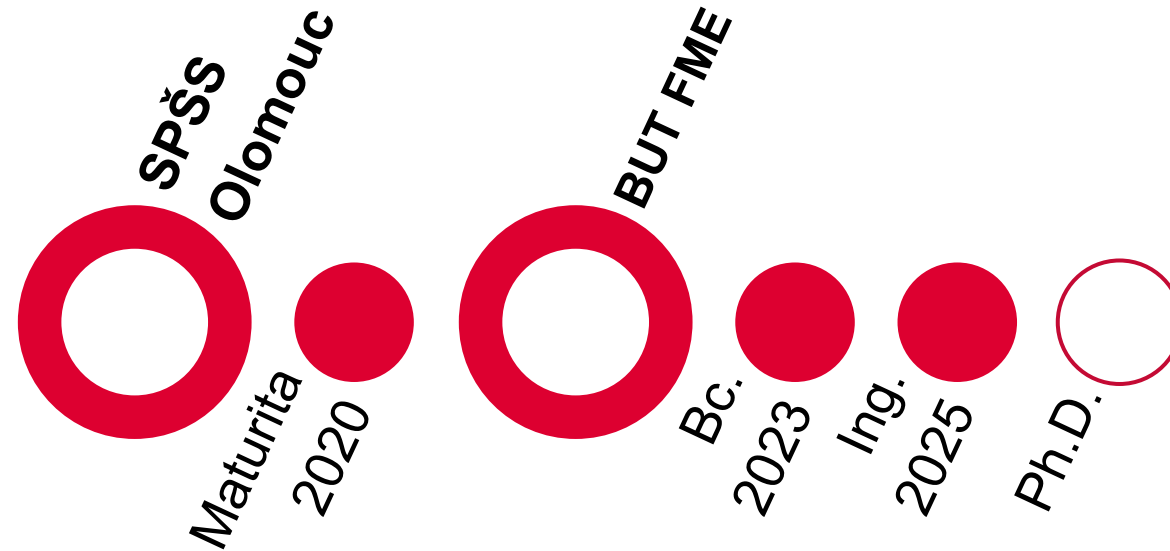


**Slovenia**



**Georgia**

# EDUCATION

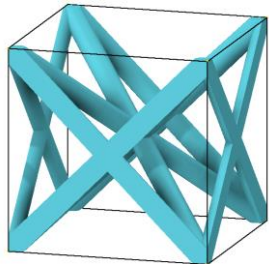




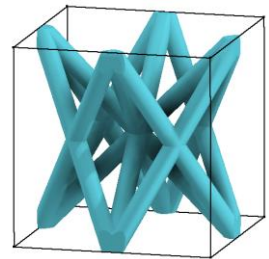
# BACHELOR'S THESIS

## MICRO-LATTICE STRUCTURES WITH VARIABLE STRUT DIAMETER

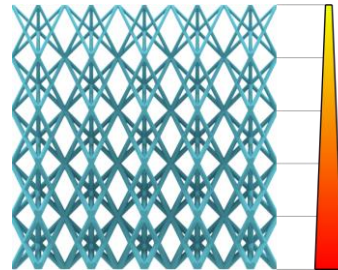
- Supervisor – Ing. Ondřej Červinek, Ph.D.
- Comparison of energy absorption capacity and deformation mechanisms of two types of micro-lattice structures and two configurations of strut diameter change



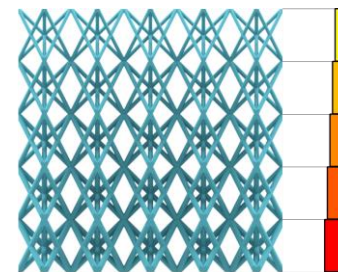
F2BCC



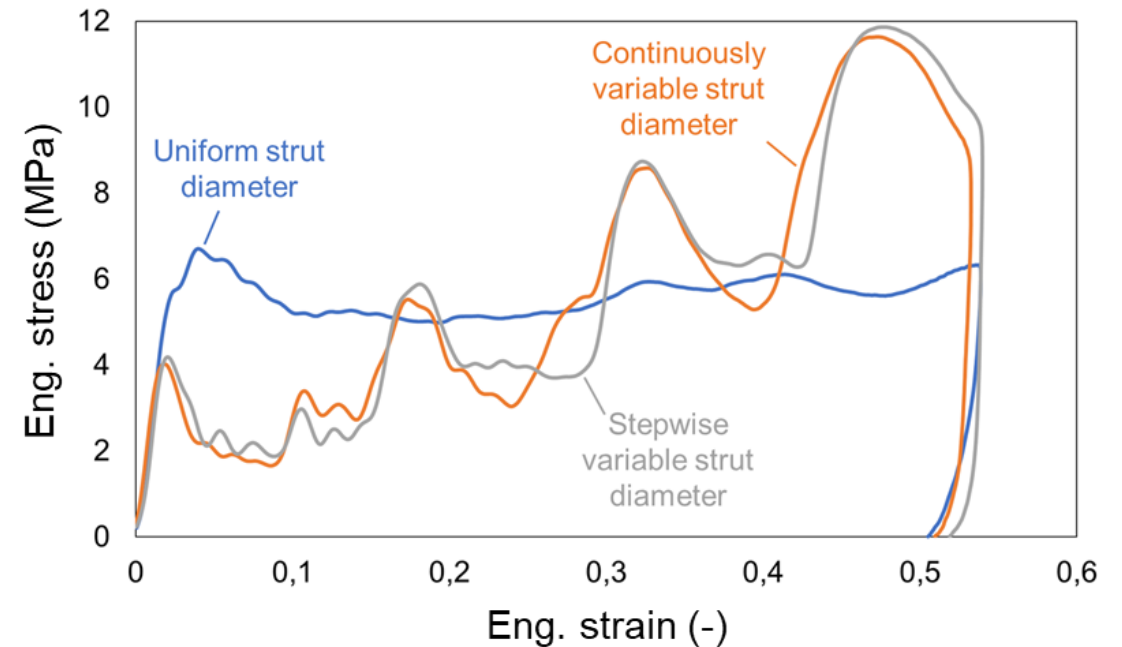
F2BCC\_45



Continuously variable strut diameter



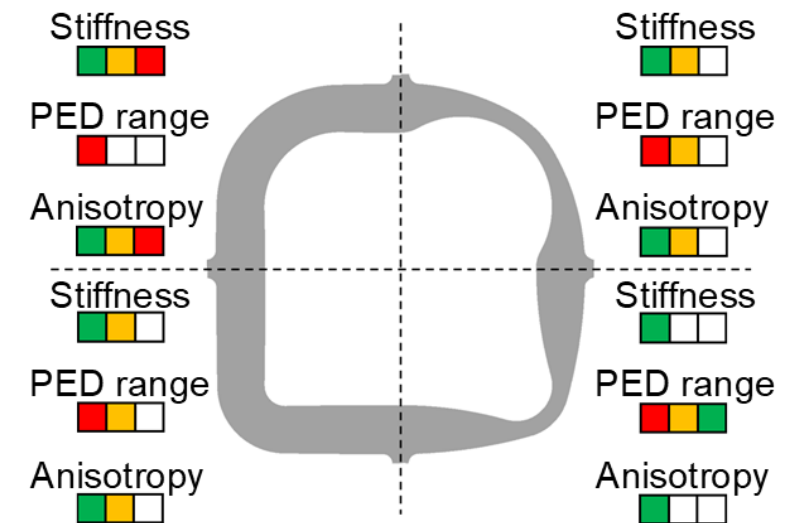
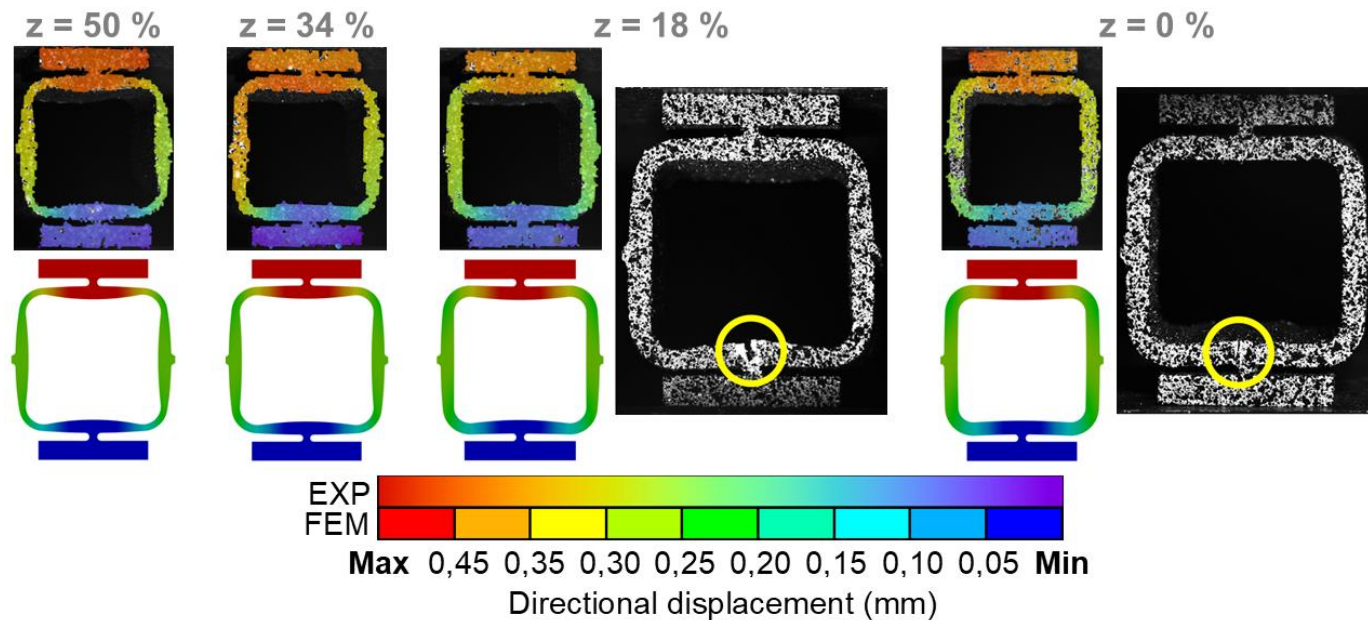
Stepwise variable strut diameter



# MASTER'S THESIS

## COMPUTATIONAL MODELING OF SUPERELASTIC METAMATERIALS

- Supervisor – Ing. Ondřej Červinek, Ph.D.
- Dependence of the anisotropy and the range of pseudoelastic deformations on the internal geometric arrangement of a 2D metamaterial





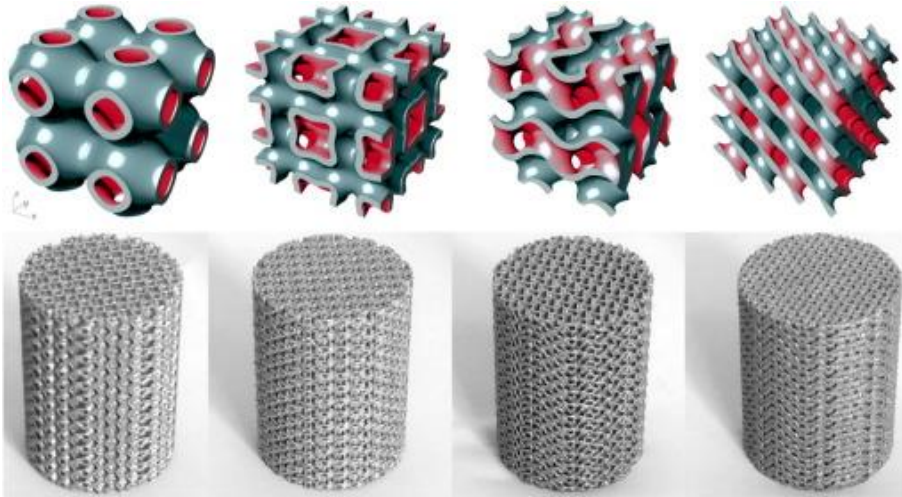
# DISSERTATION

## RECONFIGURABLE MECHANICAL METAMATERIALS

- Supervisor – doc. *Ing. Daniel Koutný, Ph.D.*
- Supervisor specialist – *Ing. Ondřej Červinek, Ph.D.*

### Segmental joint implants

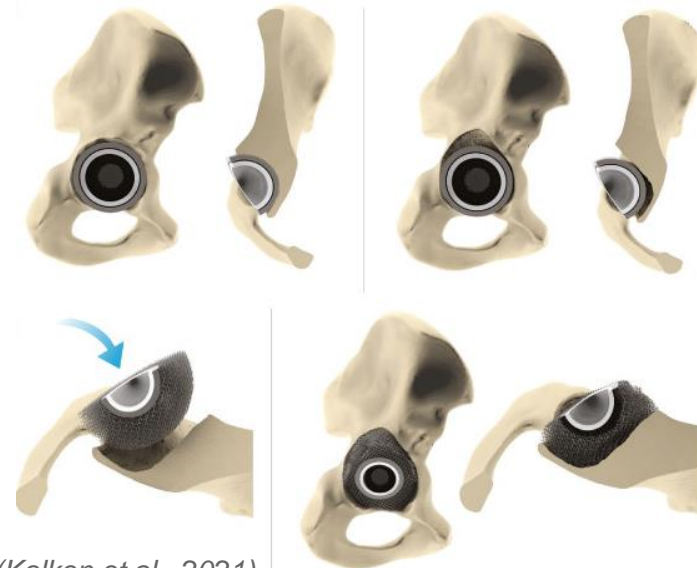
- Lattice structures
  - mechanical properties and osseointegration



(Bobbert et al., 2017)

### Ph.D. Talent ?

- Deformable acetabular cup revision implants



(Kolken et al., 2021)

# EDUCATION ACTIVITIES

## TEACHING

- 3CD - CAD

## LEARNING

- 9MOP – Methodologies of Scientific Work
- 9VPR – Research Project and its Management
- 9AJ – Academic English for Doctoral Studies
- 9MKP – FEM in Engineering Calculations
- 9NMT – Nonlinear Mechanics and FEM



# THANK YOU FOR YOUR ATTENTION

**Karel Brulík, Ing.**

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