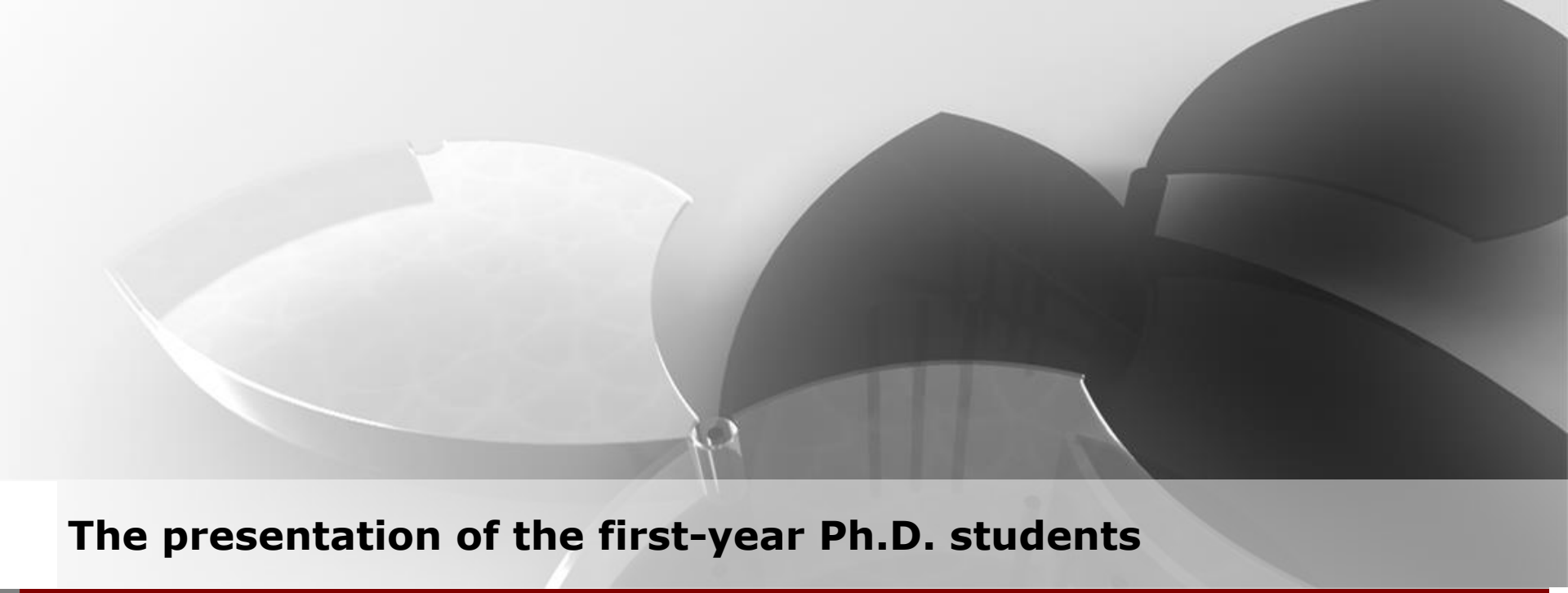


The presentation of the first-year Ph.D. students

Matúš Ranuša

Institute of Machine and Industrial Design

Supervisor: doc. Ing. Martin Vrbka, Ph.D.

Institute of Machine and Industrial Design
Faculty of Mechanical Engineering
Brno University of Technology

Presentation
8.10.2014, FME VUT in Brno, Czech Republic

CONTENT

- Introduction
- Bachelor's thesis
- Master's thesis
- Other activities
- Dissertation's thesis
- Teaching and learning activities

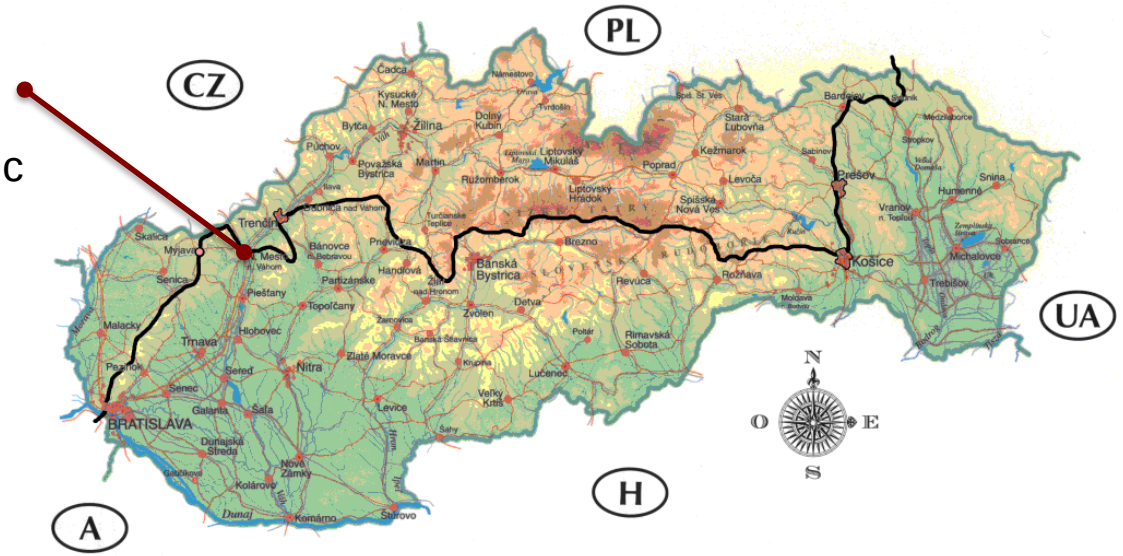
Success is not final, failure is not fatal: it is the courage to continue that counts.

Winston Churchil

MATÚŠ RANUŠA

Nové Mesto nad Váhom

Slovak Republic



Hiking

Scouting

Skiing

White water kayaking

INTRODUCE MYSELF

Education and academic qualification

- 2009-2012 **Bachelor's degree**, Brno University of Technology, Faculty of Mechanical Engineering, Mechanical Engineering

- 2012-2014 **Master's degree**, Brno University of Technology, Faculty of Mechanical Engineering, Institute of Machine and Industrial Design, Mechanical Engineering Design

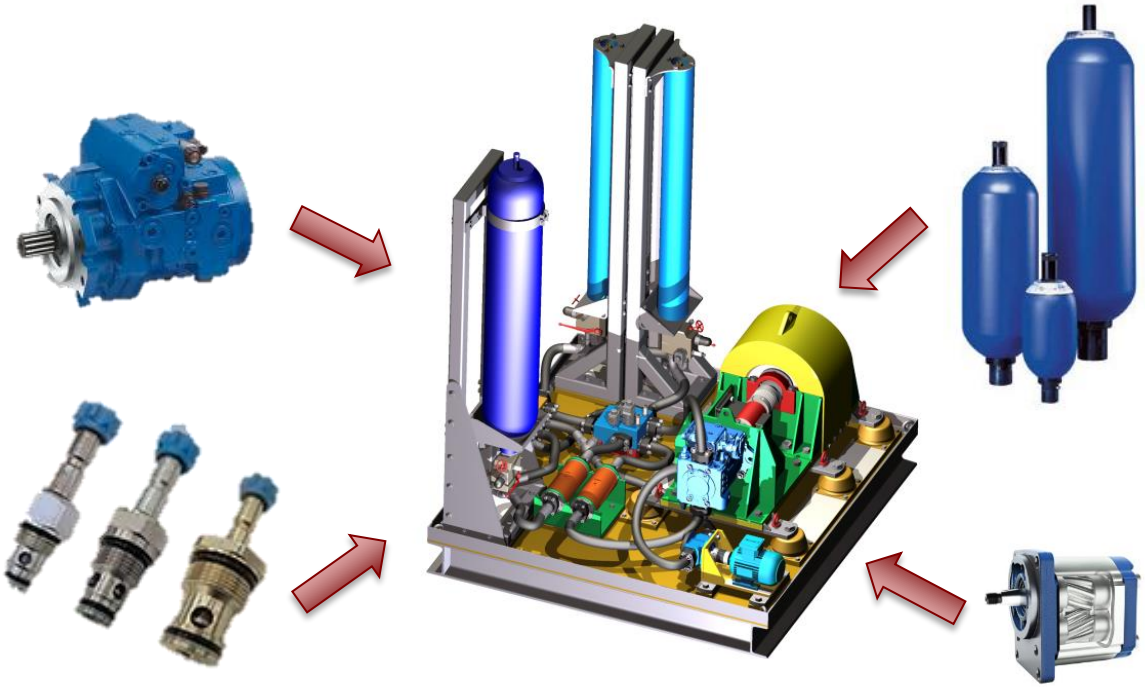
Employment experience

- 2012-2014 **Honeywell**, Brno – Student Engineer, R &D - Turbo Technologies

TITLE:

Equipment to vehicles energy recovery simulation

The bachelor thesis deals with design and construction of an experimental device – stand for simulation and recovery energy at utility vehicles.



Rexroth
Bosch Group

SUPERVISOR: **prof. RNDr. Ing. Josef Nevrlý, CSc.**

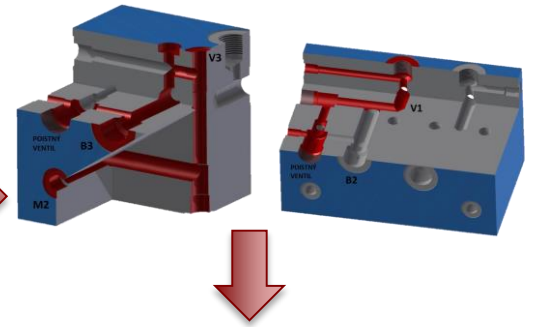
TITLE:

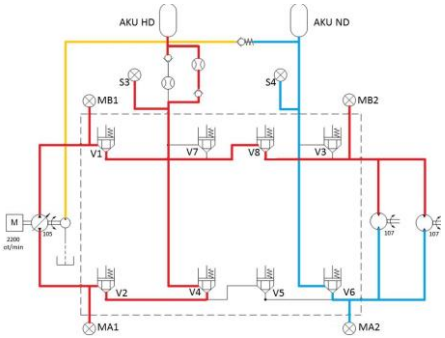
Design of valve block for recovery hydrostatic module of a vehicle

Aim of thesis is design and construction of a valve block for a hydrostatic recuperative module of a vehicle with a direct application on pneu tyred roller AP 240H produced by the AMMANN company. The thesis aims to analyze recovery functions of the valve block in several operating modes of the roller, followed by a selection of the right hydraulic components from the perspective of predefined parameters and pressure differences.

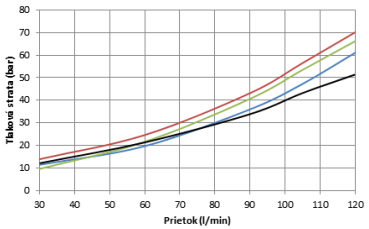
SUPERVISOR: **prof. RNDr. Ing. Josef Nevrlý, CSc.**

- Analysis of recuperation stand
- pressure dissipation
- design of the hydraulic scheme
- Design of the hydraulic valve block





Pressure dissipation

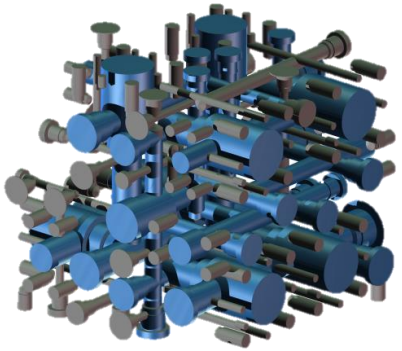


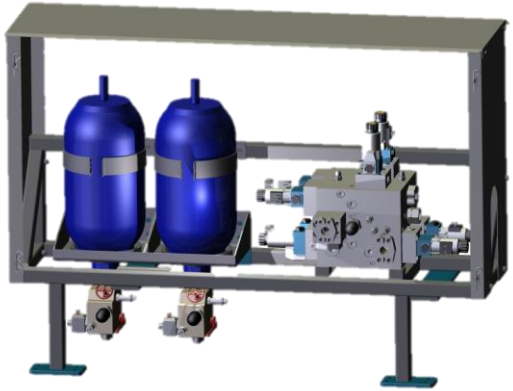
RESULTS – VALVE BLOCK

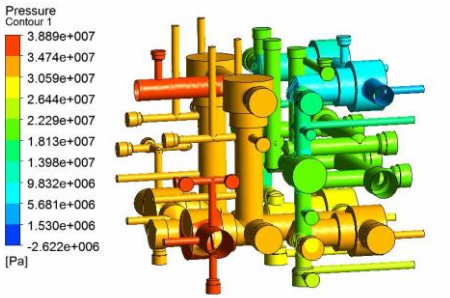
- strength calculations
- estimated pressure 40 MPa
- anylysis of solutions
- instalation - Bosch Rexroth
- verifying of function

240 x 240 x 225 mm

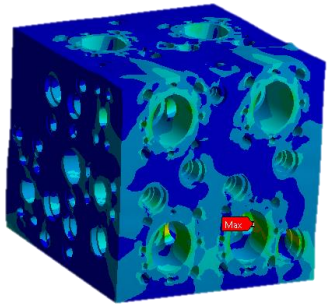
inverse display



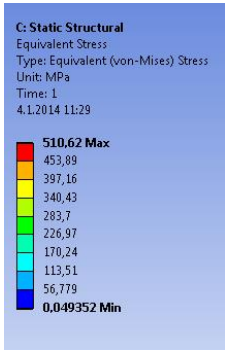




Pressure



Equivalent stress



OTHER ACTIVITIES

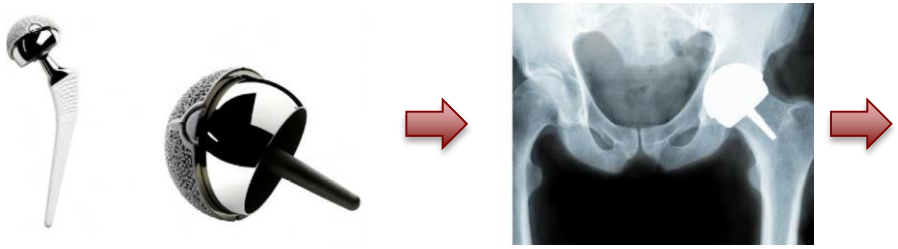
- **3D laser scanner 3DOS-UK-2**

- **Simulator for analasys of friction in the artificial hip joint**

TITLE:

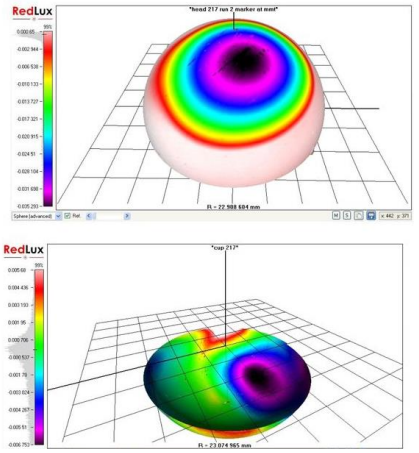
Physical and Chemical Analysis of Extracted Friction Pairs of Hip Replacements

Our research on hip replacements design and development is motivated by a growing number of revision surgeries due to failures of hip replacement pairs. The main aim of our research is to develop methodology for assessing the extracted total hip endoprosthesis implants both from the perspective of wear of articulating surfaces and from the perspective of analysis of debris released into the hip environment. The results will help to expand the existing body of knowledge in the field and create an assessment protocol for failed hip replacement pairs.



Femoral component

Acetabular component



SUPERVISOR: **doc. Ing. Martin Vrbka, Ph.D.**

OTHER ACTIVITIES

Teaching activities

Winter semester

- **5KS**
  (Machine design / Machine elements)
- **0ZP**
  (Design of racing pneumobile)

Learning activities

- **9AJ**
  (English for Doctoral Degree Study)
- **9MOP**
  (Methodologies of Scientific Work)
- **9VPR**
  (Research Project and its Manag.)
- **9EHD**
  (Elastohydrodynamics)
- **9EXT**
  (Experimental Methods in Tribology)
- **9MZO**
  (Computer method of image processing)

Thank you for your attention !

Matúš Ranuša

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