

INTRODUCTION OF THE FIRST YEAR Ph.D. STUDENT

Karel Šebesta, Ing.

ÚSTAV KONSTRUOVÁNÍ
Fakulta strojního inženýrství
VUT v Brně

FSI Brno, 14.10.2020



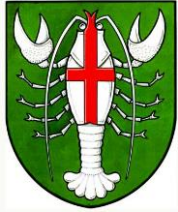
CONTENT

- Introduction
- Hobbies and interests
- Education
- Dissertation thesis
- Teaching and learning activities
- Motivation

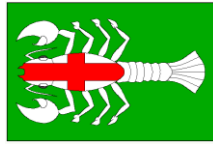


Group photo of graduates *covid version*

INTRODUCTION – HOME



Znak



Vlajka

STŘEŇ

- Situated between OLOMOUC and LITOVEL
- Part of CHKO
- Population: 650, Origin: 14c.
- Located close by Morava
Flood area
Mosquito calamity



(<https://mapy.cz>)

INTRODUCTION – LITOVEL



Znak



Vlajka



LITOVEL

- Population: 10 000, origin: 13-14 century
- Six branches of the river flows through
- *Hanácké Benátky*



INTRODUCTION – INTERESTS

Basketball - Streetball



Streeball tournament 2016



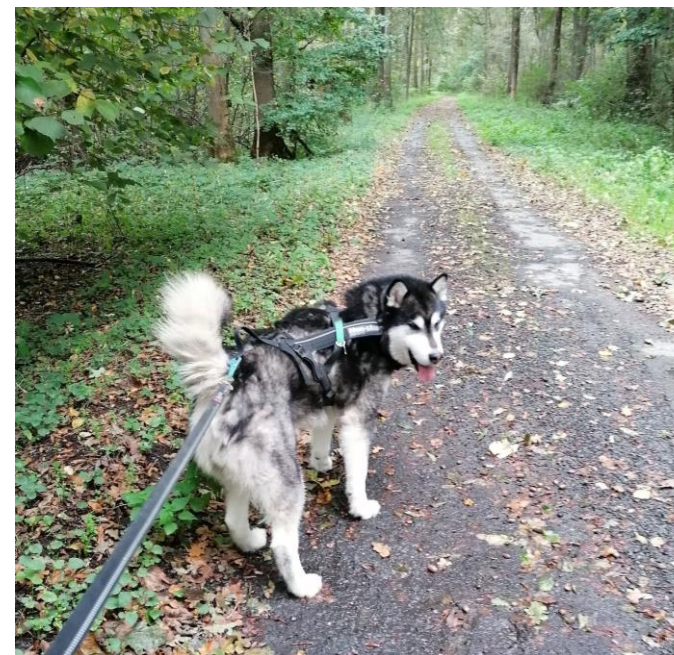
Streeball tournament 2016

INTRODUCTION – INTERESTS

Jogging – Canicross



- 45 min na 10km
- 700 km za rok 2020
- *Canicross* = běh se psem 😊



INTRODUCTION – INTERESTS

Mountain hiking



EDUCATION

Secondary school:

- Secondary Technical School of Mechanical Engineering
Computer aided design (2010-2014)

University:

- Bachelor's degree:
BUT FME –Fundamentals of Mechanical Engineering (2014-2018)
- Master's degree:
BUT FME – Mechanical Engineering Design (2018-2020)



BACHELOR THESIS

Mechanical design of plastic parts crusher

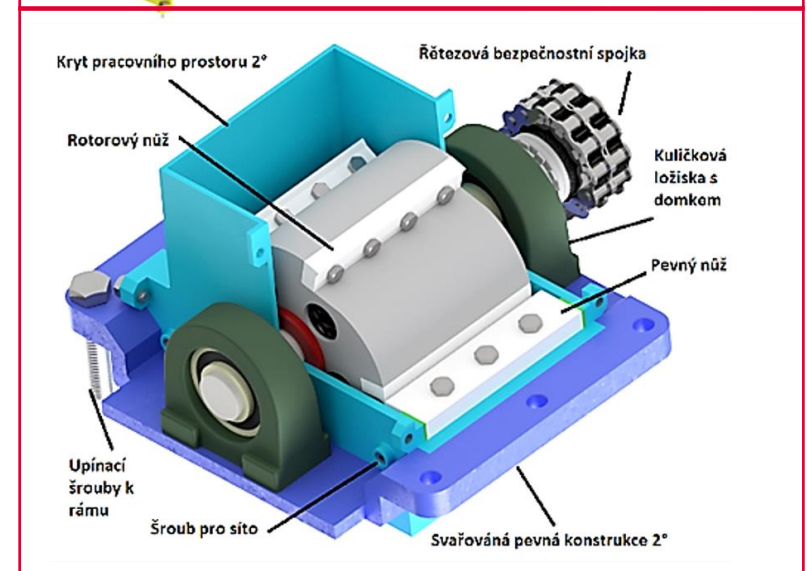
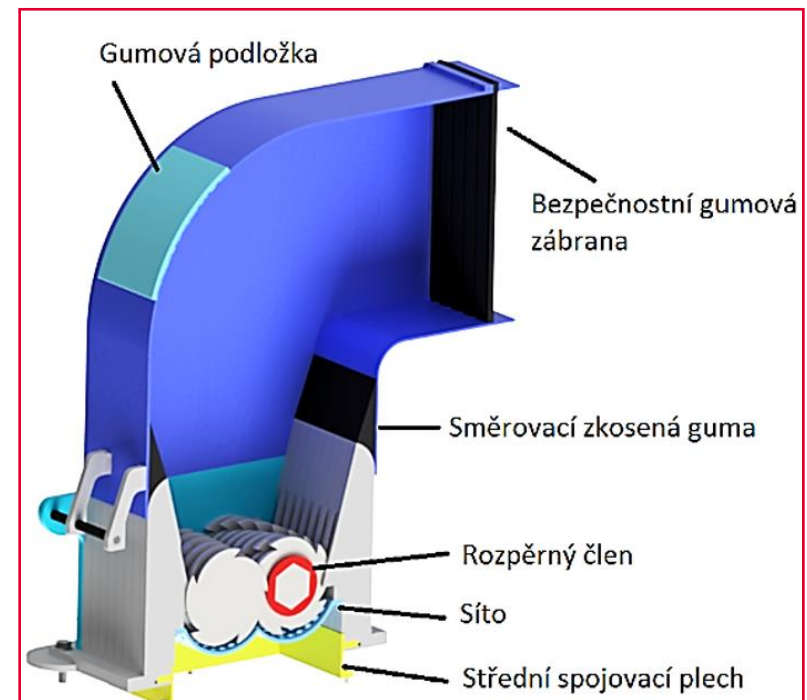
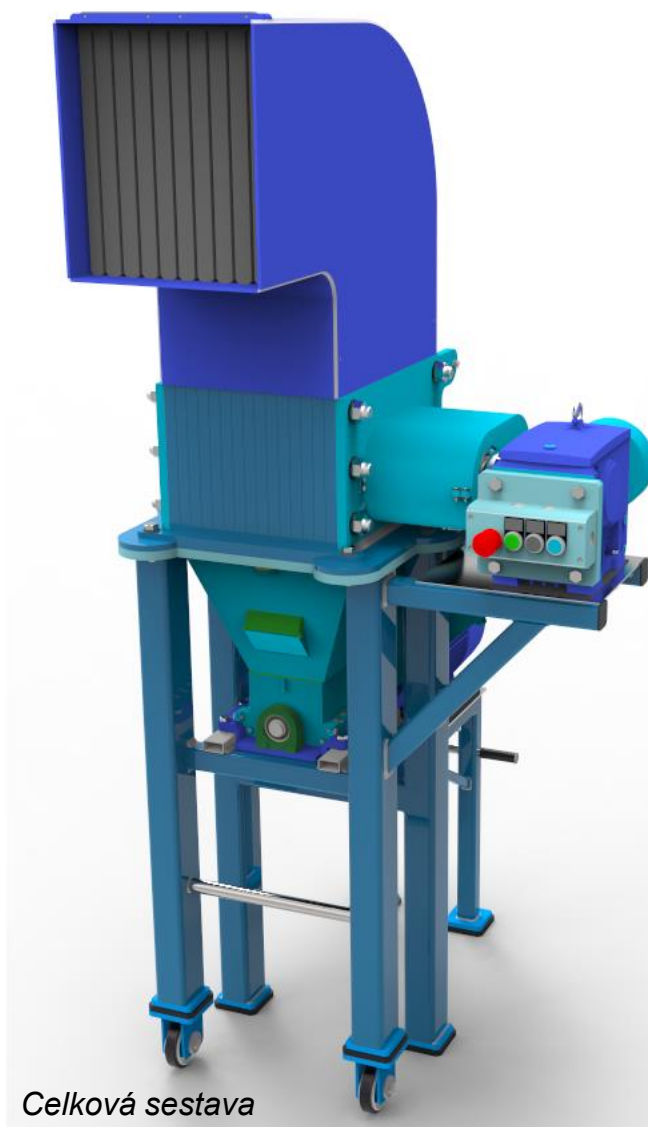
- Supervisor: doc. Ing. David Paloušek, Ph.D.

Basic parameters:

Two stages of shredder:

- First stage – slow motion
- Second stage – high speed

INPUT: 300 x 350 mm
OUTPUT: flakes 3 mm



DIPLOMA THESIS

Magnetorheological shock absorber with short response time for train bogie

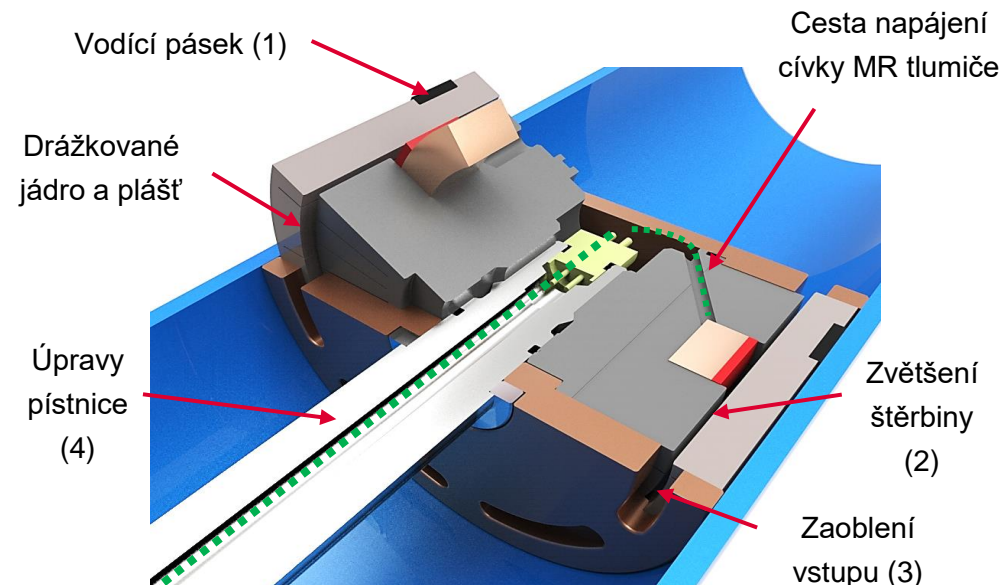
- Supervisor: Ing. Michala Kubíka, Ph.D.

Basic information:

- Static and Transient Magnetic simulation
- Suppressing Eddy current
- Improve of time response of damping force

Basic Parameters:

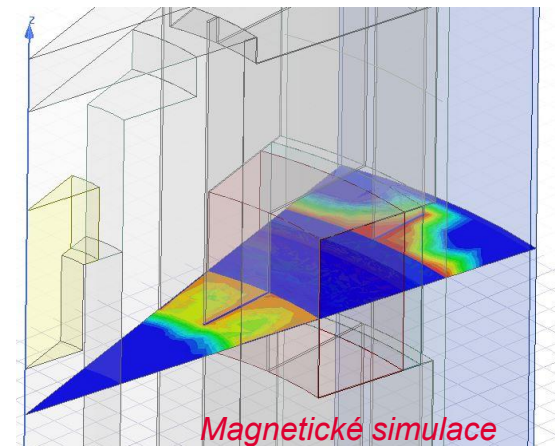
- Primary time response of rise of damping force: **8 ms**



3D sestava



Testování MR tlumiče



Magnetické simulace



Drážkované jádro + zalévací hmota

DISSERTATION THESIS

Research and development of magnetorheological fluid seal

- Supervisor: doc. Ing. Ivan Mazůrek, CSc.
- Supervisor specialist: Ing. Michala Kubíka, Ph.D.

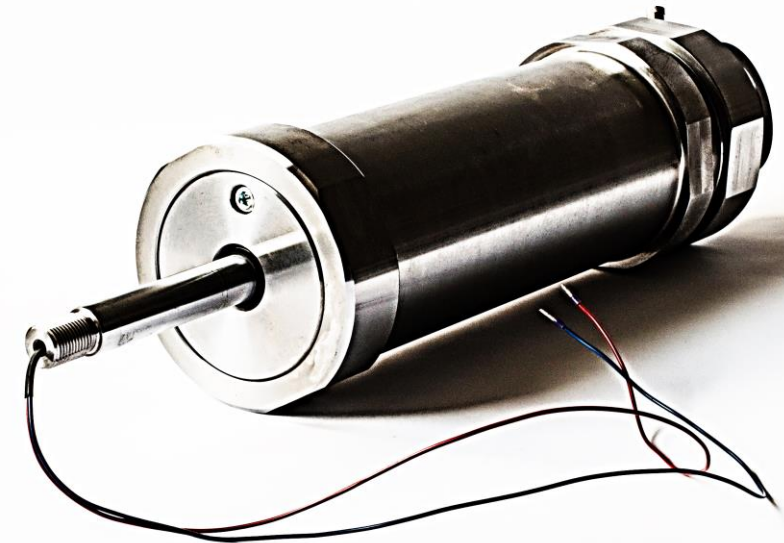
MR technology + S/A suspension



MR damper (applied research)

or

Research of Electronic valve (parts of S/A suspension)



MR damper with fast response time of damping force

TEACHING ACTIVITIES

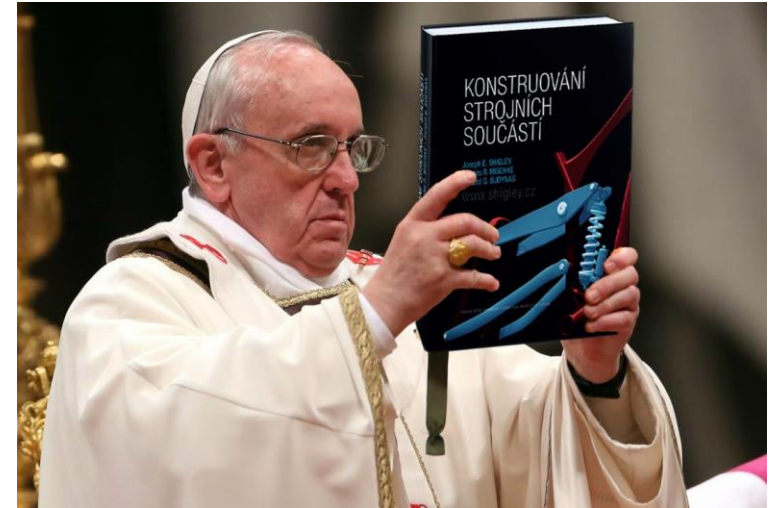
Teaching:

- 5KS – Design of machines and machine components

Learning:

- 9MOP – Methodologies of Scientific Work
- 9VPR – Research Project and Its Management
- 9AJ – English for Doctoral Degree Study

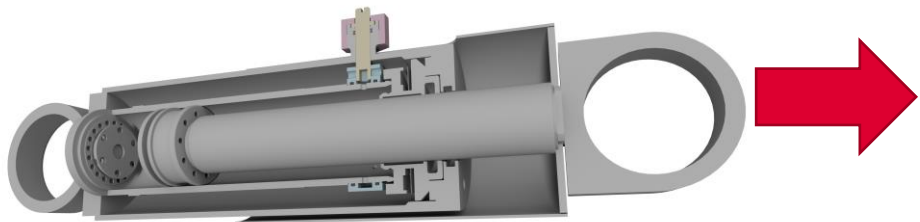
- 9STA– Statistical Analysis
- 9IDS– Modelling and control of dynamic system



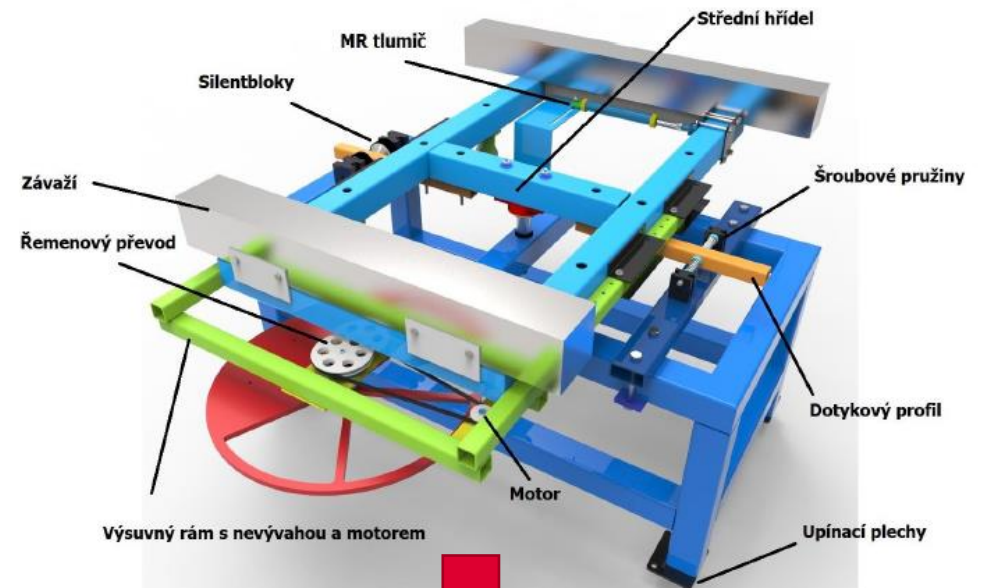
MOTIVATION

Reasons to study Ph.D.

- Utilization of achieved knowledge – MR, S/A dampers
- Interesting area of research
- Theoretical knowledge lead to create a real device



Change of passive to adaptive damper



Verification of the function of the MR damper on the model of the rolling stock bogie

THANK YOU FOR YOUR ATTENTION

Karel.Sebesta@vutbr.cz



ÚSTAV
KONSTRUOVÁNÍ

www.ustavkonstruovani.cz