Reza Alavi

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EDUCATION

Laval University, Québec, QC, Canada, June 2016 - Present

- PhD candidate in Material Engineering
- Thesis title: Corrosion-induced mechanical behavior of open-cell metal foams as bone scaffolds

University of New Brunswick (UNB), Fredericton, NB, Canada, May 2013 – December 2015

- Master of Mechanical Engineering
- Master Report: Measurement and evaluation of applied forces on a cellphone screen during text messaging

University of New Brunswick (UNB), Fredericton, NB, Canada, September 2011 - May 2013

- Bachelor of Science in Mechanical Engineering, Solid Mechanics

JOURNAL ARTICLE & CONFERENCE WORKS

- **R. Alavi**, A.H. Akbarzadeh, H. Hermawan, "Post-Corrosion Mechanical Properties of Absorbable Open Cell Iron Foams with Hollow Struts", *Mechanical Behavior of Biomedical Materials* (submitted), December 2020

- M.F. Ulum, W. Caesarendra, **R. Alavi,** and H. Hermawan, "In-Vivo Corrosion Characterization Assessment of Absorbable Metal Implants". *Coatings*, 9(5), 282, 2019

- **R. Alavi**, A. Trenggono, S. Champagne, and H. Hermawan, "Investigation on Mechanical Behavior of Biodegradable Iron Foams under Different Compression Test Conditions," *Metals*, 7(6), 202, 2017.

- **Alavi, R**., Biden, E. (2016), Potential RSI Risks in One Handed Texting, Assoc of Childrens' Prosthetics and Orthotics Clinics Annual Meeting Proceedings, pp 55, 2016, USA (Conference poster, Broomfield Colorado, April 2016)

- K. Hu, Z.T. Chen, and **R. Alavi** (2014), Finite element study of the metal cutting with damage effects, 5th International conference on Mechanical Engineering and Mechanics, 2014, China (Conference paper, Yangzhou, August 2014)

- **Seyed.M.R. Rafieipour Alavi**, A. Abedini, and Z.T. Chen (2013), Numerical simulation of the influence of particle clustering on tensile behavior of particle reinforced composites: Study of shape of the particles, 13th International Conference of Fracture, 2013, China (Conference paper, Beijing, June 2013)

ACADEMIC WORK EXPERIENCE

Graduate Academic Assistant (Funded Position), Prof. Hendra Hermawan, Department of Mining, Metallurgical and Materials Engineering & Centre Hospitalier Universitaire de Québec, ULaval, June 2016 - Present

Project: Corrosion-induced mechanical behavior of open-cell metal foams as bone scaffolds

- Conducting **corrosion tests** on samples of open-cell iron foams as **bone scaffolds (*In vitro*)**
- Conducting **mechanical characterization** of the samples
- Detailed analysis of the **scaffold structures** using **µ-CT images** with ***ImageJ*** **and** ***Dragonfly***
- Developing the **CAD model** of the scaffolds using ***SolidWorks***
- Conducting **finite-element simulation** of compression tests on the scaffold models with ***Ansys*** **(*In silico* tests)**
- Analysis of the **experimental and numerical data**
- Presenting the research results in the form of **academic writing or oral presentation**

Summer Graduate Student (Funded Position), Prof. Chris McGibbon, UNB **Institute of Biomedical Engineering**, May 2015-August 2015

Project: Instrumentation of a mobility aid device

- Developing a **3D geometrical model** of the **knee joint** from **MRI data** using ***Mimics*** and ***Itk- Snap***
- Conducting smaller sub-projects as needed, i.e. designing a **CAD model** and communicating with suppliers for our group to order a needed material
- Preparing reports

Graduate Academic Assistant (Funded Position), Prof. Zengtao Chen, Applied Mechanics and Manufacturing Laboratory, UNB, May 2013 – December 2014

Research Assistant (Funded Position), Prof. Zengtao Chen, Applied Mechanics and Manufacturing Laboratory, UNB, May 2012 - August 2012

Project: Investigation of the effect of particle-clustering on particle reinforced composites

- Investigating the effects of clusters of ellipsoidal particles for a wide range of volume fractions and geometries on the mechanical behavior of aluminum-ceramic composites
- Using the **finite element software**, ***Abaqus***, to predict the mechanical behavior, and employing ***Matlab*** for post-processing.

Project: Evaluation of the loading capacity of a bi-axial tensile testing device in the Applied Mechanics and Manufacturing Laboratory at UNB

- **Finite element simulation** using ***Abaqus***, post-processing of the numerical results by ***Matlab,*** and **CAD design** by ***NX Unigraphics***.

Graduate Teaching Assistant (Paid Position), Mechanical Engineering Department, UNB

- **Manufacturing Engineering I (ME 2222):** Running the lab and instructing students in conducting experiments, Fall 2014 and Fall 2013.
- **Design Optimization (ME 2352):** Marking lab assignments and quizzes, Winter 2014

Undergraduate Teaching Assistant (Paid Position), Mechanical Engineering Department, UNB

- **Design Optimization (ME 2352):** Marking lab assignments and quizzes, Winter 2013
- **Manufacturing Engineering I (ME 2222):** Marking assignments, Fall 2012

ACADEMIC PROJECTS & REPORTS

Master of Engineering Project, Mechanical Engineering Department, Prof. Edmund Biden, UNB, January 2015-September 2015

Evaluating the Applied Forces on a Cellphone Screen During Text Messaging

- Developing the experimental set-up using signal processing and data acquisition tools
- Running the texting experiments on multiple **human participants**
- Analyzing the text messaging contact forces using the experimental data

Graduate Course Project, Mechanical Engineering Department, UNB, January 2015 _ April 2015

Application and Fabrication Methods of Hydroxyapatite Nano-Particles: A Literature Review

- Conducting a literature review and delivering the project report

Graduate Course Project, Mechanical Engineering Department, UNB, November 2014

Development of a Finite Element Code Using Matlab

- Generating the code to solve a solid mechanic problem in which a beam was under a distributed load

Graduate Course Project, Mechanical Engineering Department, UNB, July 2014

Investigation of the Machining-Induced Residual Stresses in a Workpiece: A Literature Review

- Conducting a literature review and delivering the project report

Graduate Course Project, Mechanical Engineering Department, UNB, January 2014 - April 2014

Crack Plastic Behavior: A Literature Review

- Collaborating in a team of two graduate students to conduct a literature review and to write the project report

Master Project, Mechanical Engineering Department, UNB, May 2013 - January 2014
Numerical Simulation of Metal Cutting and Milling with Damage Effects

- Developing 2D orthogonal turning and milling models using Abaqus/Explicit
- Presenting the models and the results for the industrial partner (Apex Industries Inc.)

GRADUATE COURSE WORK

- Biomaterials and Artificial Organs
- Deformation and Fracture
- Fracture Mechanics
- Micro/ Nano Manufacturing
- Continuum Mechanics
- Basis of Biomedical Engineering

COMPUTER & MATERIAL CHARACTERIZATION SKILLS

CAD/CAE Softwares	Finite Element/ Image Processing Softwares	Math./Statistical Analysis	Material Characterization
NX Unigraphics	*ABAQUS*	*MATLAB*	***SEM***
SolidWorks	***ANSYS***	*Maple*	***EDS***
CATIA	*Mimics Innovation Suite*	***Origin Lab***	***Mechanical Properties***
Solid Edge 2D	*ITK Snap*	*Minitab*	
AutoCAD	***ImageJ***		
	Dragonfly (ORS)		

NON-ACADEMIC WORK & VOLUNTEER EXPERIENCE

Technician of Metallurgy (Paid Position), DK-Spec, Levis, Quebec, Canada, April 2019- July 2019

- Conducting various tasks in the factory as needed, e.g. sand blasting, forming, heat treating of parts, non-destructive testing **(NDT)** using **ultrasonic testing** machine
- Working on an **R&D project** for detection of cracks in thin metal parts using phased array ultrasonic testing

Member of the Executive Committee, Quebec City Student Chapter of the Canadian Biomaterial Society, June 2016 – May 2017

- Participation in meetings and assisting in organizing the events

Mathematics Tutor, Self-employed, Occasionally (Before starting the PhD)

- Tutoring Math in various levels in one-on-one or group classes

Social Convener, Volunteer, UNB Persia, September 2012-September 2013

- Assisting the president with planning for various events organized by the Persian Student Association at UNB

LANGUAGES

- **English** (Proficient)
- **French** (Intermediate)
- Persian (Proficient)

ABILITIES & HOBBIES

- Learning
- Teaching
- Working independently with a high level of responsibility
- Having proven adaptability to new environments
- Capable of effective interaction in groups and one-on-one
- Skillfully expressing and interpreting knowledge and ideas
- Psychology, hiking, weight training, cultures, languages, singing