

Mehdi Kamrani

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Ames, Iowa

❖ **Education**

- Ph.D. candidate in Engineering Mechanics,
Iowa State University, Ames, IA, spring 2016-present.
Project: interaction of phase transformation and plasticity.
- Master of Science in Mechanical Engineering,
Isfahan University of Technology, Isfahan, Iran, 2012.
Project: Effect of stress concentration on mechanical response of SMA wires.
- Bachelor of Science in Mechanical Engineering,
Tabriz University, Tabriz, Iran, 2009.
Final project: Analyzing basketball basket's welds.

❖ **Fields of Interest**

- Interaction between plasticity and phase transformation (TRIP, TWIP, Strain- Stress- Pressure- Induced phase transformation).
- Plasticity and Crystal plasticity
- Large deformation.
- Machine element design and mechanism design.
- Metal forming.

❖ **Publication (4)**

- M. Kamrani, V.I. Levitas, B. Feng, "FEM simulation of large deformation of copper in the quasi-constrain high-pressure-torsion setup", *Materials Science and Engineering A* 705, 219-230, 2017.
- M. Kamarni, and M. Kadkhodaei, "Investigation on local and global behaviors of pseudoelastic SMA wires in simple tensile test considering stress concentration of grippers", *Journal of Intelligent Material Systems and Structures*, DOI: 10.1177/1045389X14566519, 2015.
- M. Kamarni, and M. Kadkhodaei, "An investigation into the simple tensile test of pseudoelastic shape memory alloy wires considering stress concentration of grippers", *Journal of Materials Engineering and Performance*, 23(3), 1114-1123, 2014.
- M. Kamrani, H. Vahabi, A. Imenabadi, "Implementation of 1D Brinson model in 3D SMA specimens influenced by stress concentration", *International Refereed Journal of Engineering and Science*, 3(10), 74-83, 2014.

❖ **Conference (3)**

- M. Kamrani, B. Feng, V.I. Levitas, "Modeling of strain-induced phase transformations under high pressure and shear", (ICOMAT), Chicago, IL, 2017. (Proceeding, accepted for publication).
- H Ravanbakhsh, A. Jamalimehr, M. Kamrani, "Investigation of dog-bone geometry for simple tensile test of pseudoelastic shape memory alloys", 21th Annual International Conference on Mechanical Engineering, Tehran, Iran, 2013.
- Kamrani, P. Alamdari, "Solar-water-heater", The First Iranian Conference of New Technologies in Home Appliances, Isfahan, Iran, 2013.

❖ **Work Experiences**

- **Azhand-Boje** (a local producer of metallic goods such as high voltage electric cable trusses/ high way lighting poles/ highways safe guards and so on), as a mechanical designer and a drawer, 2013-2015.
- Member of “Metal Forming Center - SMA group”, Isfahan University of Technology, 2012- 2014.
- **Hepco Co.**
Repairing and investigating hydraulic systems such as different pumps, valves, orbit rolls, in general hydraulic mechanisms in different types of “Earth moving” machines such as Loader, Roller and so on, internship-2008.

❖ **Academic Experiences**

- Teaching experience
 - Giving 11 lectures on “Interaction of plasticity and phase transformation” to graduate students as EM-586X course, under supervision of Prof. V.I. Levitas, fall 2017.
- Teacher Assistantship
 - Instructor for Lab of Mechanics of Material, Iowa State University, fall 2017.
 - Instructor for Mechanics of Material and Statics, Iowa State University, spring 2017.
 - Instructor for SolidWorks Lab, Iowa State University, fall 2016.
 - Instructor for Matlab Lab, Iowa State University, spring 2016.
 - Instructor for Machine element design I & II, Isfahan University of Technology and Azad University of Isfahan, fall 2010.

❖ **Research and Projects**

- Study of large deformation of BN (Boron Nitride) using crystal plasticity, PhD project, current.
- Strain-induced phase transformation of Zr under high-pressure and shear, PhD project, 2017.
- Large deformation of Copper under high- pressure and shear, PhD project, 2017.
- Lumped-mass stick modeling of a large vertical vessel for studying its response under earthquake, used in gas and oil industry, 2015.
- Lumped-mass stick modeling of a large boiler for studying the possible contact between its piping under the earthquake, used in gas and oil industry, 2015.
- Response of a simple composite pipe under variable internal pressure, 2014.
- Modeling the effect of presence of a penny-shape crack in the nozzles and the transitions for vessels and boilers, for gas and oil industry, 2014.
- Simulation of multi step forging of a bulk part, for a local factory, 2014.
- Simulation of a deep drawing process, 2014.
- Elastic-plastic simulation of a flange connection considering associate bolting, used in gas and oil industry, 2014.
- Simulation of hydro-forming of a complicated part used for automobiles, 2013
- Multi-step bending of a plate for producing highway guard rail, for a local factory, 2013.

❖ **PATENTS (8)**

- Invention certificate (in Iran), “A gloves for producing heat and electricity”, as the head of a four-person team, 2014.

- Invention certificate (in Iran), “Semi-automatic mold for producing “Daf””, as the head of a four-person team- (“Daf” is an Iranian musical instrument), 2014.
- Invention certificate (in Iran), “Drop slip angle test device”, (a device which is used in textile engineering laboratories), as a partner of a two-person team, 2012.
- Invention certificate (in Iran), “Solar water heater with ability of producing continues hot water”, as the head of a two-person team, 2012.
- Invention certificate (in Iran), “Bag-desk for notebooks”, as a partner of a three-person team, 2011.
- Invention certificate (in Iran), “Automatic wrench”, 2010.
- Invention certificate (in Iran), “Wire cutter with a large force to displacement ratio”, 2010.
- Invention certificate (in Iran), “Hammer with ability of increasing transmitted force or displacement”, 2010- Participated in “Shaihk Bahaei” invention gallery, 2011.

❖ **Computer Skills**

- Finite Element Simulation: ABAQUS (co-founder of the www.HelpMeWithAbaqus.com).
- Programming: FORTRAN, Python, MATLAB.
- Drawing: Catia, Auto-Cad.
- Familiar with: PVElite, Ansys-cfx, Solid works.

❖ **Extracurricular Activities**

- Rock climbing
- traveling
- Manufacturing woody models

❖ **References**

- Prof. V.I. Levitas, Iowa State University (vlevitas@iastate.edu)
- Prof. M. Kadkhodaei, Isfahan University of Technology (kadkhodaei@cc.iut.ac.ir)