Mohammad Reza **Hajiha**

Curriculum Vitae

Tehran, Iran
reza.hajiha1996@gmail.com
+98 (919) 383 4297

LinkedIn | ResearchGate | Google Scholar

Education

Master of Science in **Materials Science and Engineering,** Sep 2018
Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran Mar 2021
GPA: 17.94/20 (3.76/4.0)
Thesis Topic: The Simulation of Variations in Heat Transfer and Material Flow During Friction-Stir Welding of AA6061 and AA5052 Aluminum Alloys
Thesis Grade: 19.50/20
Supervisor: Dr. Ali Farzadi (Amirkabir University of Technology), Dr. Mohammad Saeedi (Dalhousie University)

Bachelor of Science in **Materials Science and Engineering,** Sep 2014
Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran Aug 2018
GPA: 16.30/20(3.36/4)
Thesis Topic: Chemical Precipitation-Based Recovery of Nickel, Cobalt, and Zinc from Cold Filter Cake Generated in Zinc Production Plants
Thesis Grade: 19.00/20
Supervisor: Dr. Milad Rezaee (Amirkabir University of Technology)

Research Interests

- Additive Manufacturing (3D Printing)
- Alloy Chemistry and Phase Transformations
- Welding and Joining Technologies
- Materials Characterization
- Recyclable and Sustainable Materials
- AI and Machine Learning in Materials Science

Publications

Peer-reviewed Journal Papers

- **Hajiha M**, Farzadi A, et al., "Microstructural and Mechanical Properties of Dissimilar Joining of AA5052 and AA6061 by Friction Stir Welding", J Welding Science and Technology, **2024**, Doi: 10.47176/JWSTI.2024.04.
- **Hajiha M**, Farzadi A, et al., "Solidification Microstructure, Post-Braze Heat Treatment, and Stress Rupture of Wide Gap Brazed Inconel 738", J Welding in the World, Under Review.
- **Hajiha M**, Farzadi A, "Effect of Alloy Position and Process Conditions on Defect Formation in Dissimilar FSW: A CFD-Based Study", Under Review.

Conference Papers

- **Hajiha M**, Farzadi A, et al., "Optimization of Friction Stir Welding Parameters for Dissimilar Joining 5xxx and 6xxx Series Aluminum Alloys", 5th International Symposium on Characterization, August 27-29, 2025. in Turkey (Poster presentation).

Academic Projects

Plate-Fin heat exchangers: optimization of the brazing procedure of AA3003 using AA4004 clad sheet	Dec 2024
Simulation of Lattice Structures Using nTopology: Optimizing Additively Manufactured Heat Exchangers	Sep 2024
The simulation of variations in heat transfer and material flow during friction-stir welding of AA6061 and AA5052 aluminum alloys	Mar 2021
Development of Al_2O_3–Cr Functionally Graded Materials Using Powder Metallurgy (Mechanical Alloying with Ball Mills)	Dec 2020
Investigation of the Effect of Welding Parameters and Thickness on the Occurrence of Cold Cracking in Welding of A517 Gr. B Steel	Sep 2020
Magnetic Resonance Imaging: From Basics to Advanced Analysis, a research project for the Advanced Methods of Materials Analysis course	Jan 2019
Finite Element Simulation of Heat Transfer in TIG Welding of Aluminium Alloys, a research project for Computer-Aided Design & Joining Methods course	Jan 2019
Recovery of Nickel, Cobalt, and Zinc from Zinc Plant Residue by Chemical Precipitation Method	Aug 2018

Work Experience

R&D Expert, Full Time — May 2021 – Present
Hilavis Arina, Tehran/Markazi, Iran

- Design and develop precision tools and dies for fabricating plate-fin heat exchanger components such as fins, sidebars, and related elements.
- Utilize advanced computer-aided design (CAD) software to model tools and dies with high dimensional accuracy.
- Apply modern manufacturing techniques to produce components efficiently and in accordance with industry standards.
- Conduct test runs on manufactured components to ensure they meet all dimensional and functional specifications.
- Analyse the results of test runs to identify performance deviations or manufacturing issues.
- Implement design adjustments based on test outcomes to optimize the performance, reliability, and manufacturability of the final plate-fin heat exchanger units.

Laboratory Supervisor, Full Time — May 2021 – Present
Hilavis Arina, Tehran/Markazi, Iran

- Conduct metallographic sample preparation, including sectioning, mounting, grinding, polishing, and etching of specimens.

- Operate standard metallographic testing equipment such as stereoscopes and optical microscopes to examine microstructures.
- Interpret microstructural features and document findings to support material quality assessments and failure analysis.
- Collaborate with external laboratories to carry out advanced material characterization techniques.
- Coordinate and interpret results from specialized tests such as scanning electron microscopy (SEM), quantometry (optical emission spectroscopy), and mechanical testing (e.g., tensile, hardness).
- Integrate external test data into internal reports to inform material selection, process improvements, or failure investigations.

Welding Lab Instructor, Part-Time — Sep 2018
Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran — Feb 2021

- Assessed and graded students' classwork, assignments, and projects, providing accurate and constructive feedback to support their learning progress.
- Delivered hands-on instruction in the welding laboratory, guiding students through practical exercises in GTAW, SMAW, and GMAW processes.
- Emphasized proper safety protocols, equipment handling, and industry-standard welding techniques during all lab sessions.
- Monitored student performance and provide individual support to help them build both confidence and technical proficiency.

Research Assistant- Powder Metallurgy Lab, Part-Time — Sep 2020
Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran — Sep 2021

- Contributed to the development of a functionally graded alloy using powder metallurgy by combining Al_2O_3 and Cr powders to achieve a gradual transition in material properties along the sample.
- Assisted in powder preparation, compaction, and sintering processes to ensure uniformity and quality in fabricated samples.
- Support microstructural and mechanical evaluations through specimen preparation, hardness testing, and microscopic analysis.

Materials and Metallurgical Engineering Intern, Full-Time — Jun 2016
Railways of the Islamic Republic of Iran, Tehran, Iran — Sep 2016

- Assisted in the inspection and failure analysis of rail components, focusing on fracture surfaces, wear patterns, and material degradation mechanisms.
- Contributed to quality control assessments of welding, joining, and machining processes used in maintenance and repair operations.
- Document findings and collaborated with engineers to recommend corrective actions or process improvements.

Workshops and Webinars

50-hour workshop on “Shielded Metal Arc Welding (SMAW)”, Iran Technical & Vocational Training Organization, Aug 2021

25-hour workshop on “Ansys Fluent Simulation Program”, Amirkabir University of Technology (Tehran Polytechnic), Aug 2020

100-hour workshop on “Visual Testing (VT) | Non-Destructive Material Testing”, Iran Technical & Vocational Training Organization, Jun 2018

50-hour workshop on “Dye Penetrant Testing (PT) | Non-Destructive Material Testing”, Iran Technical & Vocational Training Organization, Aug 2018

100-hour workshop on “Magnetic-Particle Testing (MT) | Non-Destructive Material Testing”, Iran Technical & Vocational Training Organization, Aug 2018

8-hour workshop on “Key to Steel”, Amirkabir University of Technology (Tehran Polytechnic), Aug 2016

Selected Courses

- Advanced Solidification 19.3/20
- Advanced Welding 20/20
- Advanced Methods of Materials Analysis 19/20
- Computer-Aided Design & Joining Methods 17.25/20
- Advanced Welding Metallurgy 20/20
- Simulation in Materials Engineering 18.6/20
- Design of Welded Joints 18.25/20
- Corrosion & Oxidation 20/20
- Powder Metallurgy 16.5/20

Honors & Awards

- **Secured 2nd place** in the class ranking among 16 students upon completion of the M.Sc. program in March 2021.
- **Secured 3rd place** in class ranking among 63 students upon completion of the B.Sc. program, Sep 2018.
- **Granted admission** from the Talented Student Office of Amirkabir University of Technology to study "Materials and Metallurgical Engineering" field at the graduate level without the entrance exam, Sep 2018.
- Achieved a top ranking of 1,600th out of 300,000 participants in a highly competitive national examination, Jun 2014.

Memberships and Extracurricular Involvement

Member of the Editorial Board of Kaveh Journal of Scientific Research, Amirkabir University of Technology (Tehran Polytechnic)	Sep 2019 Sep 2020
Assistant Director for the Student Theatre Production “Fools” by Neil Simon, Amirkabir University of Technology (Tehran Polytechnic)	Mar 2019
Core Member of the National Assembly of Scientific Student Associations, Ministry of Science, Research and Technology	Apr 2018 Apr 2019
Member of the Scientific Association of the Materials and Metallurgical Engineering Department, Amirkabir University of Technology (Tehran Polytechnic)	Apr 2017 Apr 2018
Executive Secretary of the 2nd International Metallography and Microscopic Image Contest, Amirkabir University of Technology (Tehran Polytechnic)	Sep 2017 May 2018
Host of The Opening Convocation Ceremony, Amirkabir University of Technology (Tehran Polytechnic)	Sep 2016

Skills

Language

- English (C; **IELTS Academic 7.5/9**) | Persian (Nativa) | Arabic (B) | German (A)

Simulation Software

- Ansys Fluent | Ansys FEA | nTopology

Programming

- C (Expert) | Python | Fortran | Matlab

Technical

- Material Characterization | Mechanical Testing | Metallography | Machining Technologies (Expert) |Welding and Brazing of Aluminum and Nickel-based Alloys | Additive Manufacturing

Technical Software

- X-pert | Key to Steel | Image J | ToupView

CAD and Design

- AutoCAD | SOLIDWORKS | Ansys SpaceClaim | Adobe Photoshop | Microsoft Office

Soft

Academic Writing and Searching | Team Leading and Team Working | Quick Learner | Problem Solving

References

- **Dr. Kamran Dehghani** (Full Professor)
  Department of Materials and Metallurgical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Iran
  Email: dehghani@aut.ac.ir
- **Dr. Nader Parvin** (Full Professor)
  Department of Materials and Metallurgical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Iran
  Email: nparvin@aut.ac.ir
- **Dr. Ali Farzadi** (Associate Professor)
  Department of Materials and Metallurgical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Iran
  Email: farzadi@aut.ac.ir
- **Dr. Pirooz Marashi** (Associate Professor)
  Department of Materials and Metallurgical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Iran
  Email: pmarashi@aut.ac.ir
- **Mr. Reza Bahrami** (Metal Forming & Powder Metallurgy Labs Director)
  Department of Materials and Metallurgical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Iran
  Email: r.bahrami@aut.ac.ir