# **CURRICULUM VITAE**

# ALIREZA KARIMI

Graduate Research Assistant, School of Materials Engineering, Iran University of Science and Technology, Tehran, Iran

□ alireza.karimi.19995@gmail.com

#### **EDUCATION**

#### 2017 - 2020

#### M.Sc. in Materials Engineering

TEHRAN, IRAN

Iran University of Science and Technology (IUST)

- Thesis: Design and implement a novel sustainable combustion welding process for dissimilar joining of metalceramic couples using **NiTi** interlayers
- CGPA: 15.16/20 (Iranian Scale)
- Supervisors: Prof. Mandana Adeli and Prof. Mansour Soltanieh

#### 2013 - 2017

### **B.Sc.** in Metallurgy and Materials Engineering

ISFAHAN, IRAN

Golpayegan College, Isfahan University of Technology (IUT)

- Thesis: Production and characterization of corrosion-resistant amorphous Fe-Ni-Cr coatings
- CGPA: 15.17/20, last two years 17.17/20 (Iranian Scale)
- Supervisor: Prof. Seyed Mahdi Rafiaei

### **RESEARCH INTERESTS**

- Advanced Materials (High Strength Lightweight Alloys, Metal Matrix Composites (MMCs)) Synthesis, Welding, and Characterization.
- Machine learning, Predictive Modeling, Neural Networks, FEM simulation, FEM for Manufacturing Processes

#### RESEARCH EXPERIENCES

Machine Learning Assisted Investigating the effect of Mechanical Activation Duration (MAD) on microstructure and corrosion behavior of TiAl intermetallic compounds

2021 - present

School of Materials and Metallurgy Engineering, IUST

- Fabricated TiAl Intermetallic compounds with various MADs using the SHS process.
- Investigated the effect of MAD on corrosion behavior (EIS1) and microstructure (SEM) of TiAl samples
- Employed a constructed ANN architecture for investigating the effect of MAD on the corrosion behavior of synthesized TiAl intermetallic.

#### Study on the wear behavior of NiAl-TiC-TiB<sub>2</sub> composite produced by the combustion synthesis process

2020 - present

School of Materials and Metallurgy Engineering, IUST

- Fabricated NiAl / TiC-TiB<sub>2</sub> composites using a combustion synthesis process
- Enhanced composite hardness profile due to even distribution of TiC-TiB2 phases
- Demonstrated superior wear resistance in composites with higher TiC-TiB<sub>2</sub> using Sliding wear tests
- Trained an ANN model to predict the properties of composite with various TiC-TiB2 content.

Design and implement a novel and sustainable combustion joining process using combustion synthesis reactions in Ni-Ti powder mixtures

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<sup>&</sup>lt;sup>1</sup> Electrochemical Impedance Spectroscopy

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2018 - 2020

#### School of Materials and Metallurgy Engineering, IUST

- Fabricated VCN-150 steel joints and then WC-Co/VCN-150 dissimilar joints via combustion synthesis within Ni-Ti compound (Self-heating process)
- **Designed** and **fabricated** a novel **set-up** for exerting an **axial force** on the welding components in the **Argon** atmosphere and **decreasing** the interlayer porosity
- Performed microstructural and mechanical characterization of joints (SEM, XRD, Shear strength)

#### Effect of space holder materials on the porosity of synthesized NiTi Foams

2018-2019

School of Materials and Metallurgy Engineering, IUST

- Evaluation of the effect of space holder material on the distribution and size of the porosities
- Performed microstructural characterization (SEM) and Phase analysis via XRD techniques

## Fabrication of amorphous Fe-Ni-Cr coatings by electric deposition process

2015 - 2017

Department of Materials Engineering, IUT

• Investigated the impact of current density on the thickness and structure (amorphous/crystalline) of coatings

#### **PUBLICATION**

- F. Soleimani, M. Adeli, M. Soltanieh, H. Saghafian, A. Karimi, Fabrication and wear behavior of TiC/TiB<sub>2</sub>-reinforced NiAl intermetallic matrix composites, Wear, (Under Review)
- A. Karimi, M. Adeli, M. Soltanieh, Dissimilar joining of cemented carbide to low-carbon steel via combustion welding: Effect of process parameters on the interfacial microstructure and joint strength, Journal of Manufacturing Process, Vol. 77, Pages 551-560, <a href="https://doi.org/10.1016/j.jmapro.2022.03.043">https://doi.org/10.1016/j.jmapro.2022.03.043</a>
- A. Karimi, M. Adeli, M. Soltanieh, The application of combustion synthesis reactions in Ni-Ti system in the joining of steel to tungsten carbide, Journal of New Materials, Vol. 11, pages 103-114, 20.1001.1.22285946.1399.11.41.8.2
- A. Karimi, M. Adeli, M. Soltanieh, Investigating the possibility of establishing steel-steel joints using combustion synthesis reactions, 8th International Conference and Exhibition on Materials Engineering and Metallurgy Oct. 2019, <a href="https://civilica.com/doc/963690/">https://civilica.com/doc/963690/</a>

#### HONORS AND AWARDS

### Patent (In process): Intelligent atmosphere supply system for sinter furnaces.

• Facilitated the atmosphere-controlling process of box furnaces (design and implementation)

## Awarded governmental full scholarship (Tuition Waiver) and governmental fund (Research Grant)

• Issued by Ministry of Science, Research and Technology due to national entrance exam for two years of M.Sc. (2017-IUST) and four years of B.Sc. (2013-IUT)

#### **TEACHING EXPERIENCES**

## **Graduate Teaching Assistant** (Metallurgical Processes Laboratory)

2018 (Aug - Dec)

• School of Materials and Metallurgy Engineering (IUST), Prof. M. Adeli (adelim@iust.ac.ir)

Tutor (English - Math)

Feb2022-present

• High-school students

#### **WORK EXPERIENCES**

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#### **Metallurgical Laboratory Manager**

Sep2021-present

SEPAHAN FOOLAD ATASHGAH (STEEL CASTING)

- Teamwork leadership in the research and technological development group (14 people).
- Achieved ISO/IEC 17025 Certification.
- Performed scientific workshops for teaching laboratory members (SEM, TEM, ICP)
- Supervision of equipment calibration (OES, XRF)

## Research Assistant (part-time from Sep 2021)

Sep2018-present

IRAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

- Contribution to data analysis and interpretation as a diligent research assistant.
- Assisting in **literature reviews**, experiment **design**, and research documentation.
- Detail-oriented and proactive, I thrive in a collaborative research environment.

## **Metallurgical Laboratory Specialist**

2021 (Feb-Sep)

HAMIRAN STEEL (REFERENCE LABORATORY)

- Acquired Hands-on experience with microstructural (SEM, OM), mechanical (tensile, micro-hardness),
  Optical Emission Spectroscopy, and NDT characterization techniques.
- Customer Scientific consultation.

#### **Patent Engineer**

2020 (Jan-Oct)

**IDI COMPANY** 

 Drafting and filing patent applications, conducting research to ensure the inventions are unique, and navigating legal and technical aspects to protect intellectual property.

#### **Engineering Internship**

2016 (Apr-Sep)

ESFAHAN STEEL COMPANY

• Performed standardized mechanical and microstructural QA tests (ASTM, ISO, DIN)

#### LANGUAGE SKILLS

Persian: Native Language

English: Fluent, TOEFL (iBT): On December 2023

#### **PERSONAL SKILLS**

**Technical Skills** 

• Materials characterization techniques (TEM, SEM, OM, RAMAN), XRD, EDS, OES, ICP, XRF, EIS (corrosion), SLIDING WEAR TEST, NDT (UT, PT, MT), and MECHANICAL testing equipment.

**Communication skills** 

• Gained through my experience as a materials selection **consulting specialist**, teaching experience as a **tutor** and graduate **teacher assistant**, and **management** experience in a laboratory.

Managerial skills

• **Head** of metallurgical laboratory (currently responsible for a team of **14 people**)

Computer skills

• ANSYS, HighScore (plus), SOLIDWORKS, Origin, Minitab, ZsimpWin, EC-Lab, Microsoft Office, Python programming language

**Certificates** 

• **TEM** (EPFL), **Python** (University of Michigan), **Data Science** (IBM, Georgia Tech), **Conference Presentation** (Int. Imat Conference)

## **REFERENCES**

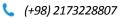
Mandana Adeli Assistant Professor School of Materials Engineering, Iran University of Science and Technology, Tehran, Iran



**(**+98) 2173228844

adelim@iust.ac.ir

Mansour Soltanieh Full Professor School of Materials Engineering, Iran University of Science and Technology, Tehran, Iran



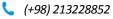
mansour\_soltanieh@iust.ac.ir

Seyed Mahdi Rafiaei Associate Professor Department of Materials Science, Isfahan University of Technology, Isfahan, Iran



rafiaei@gut.ac.ir

Seyed Hossein Seyedein Full Professor School of Materials Engineering, Iran University of Science and Technology, Tehran, Iran



<u>seyedein@iust.ac.ir</u>