CURRICULUM VITAE

ALIREZA KARIMI

Isfahan - Iran | +(98) 9136937570 | alirezakrm.github.io | alireza.karimi.19995@gmail.com

EDUCATION

2017 - 2020 | *Iran University of Science and Technology (IUST)* — *TEHRAN, IRAN*
M.Sc. in Materials Engineering

- **Thesis Title:** Design and implement a novel sustainable combustion welding process for dissimilar joining of metal-ceramic couples using **NiTi** interlayers
- **GPA:** 81 / 100
- **Supervisors:** Prof. Mandana Adeli and Prof. Mansour Soltanieh

2013 - 2017 | *Golpayegan College, Isfahan University of Technology (IUT)* — *ISFAHAN, IRAN*
B.Sc. in Metallurgy and Materials Engineering

- **Thesis Title:** Production and characterization of corrosion resistant amorphous Fe-Ni-Cr coatings
- **GPA:** Last two years = 90 / 100, overall 75 / 100 (via 142 credits),
- **Supervisor:** Prof. Seyed Mahdi Rafiaei

RESEARCH INTERESTS

- Advanced Materials (Shape Memory Alloys, High Strength Lightweight Alloys, Metal Matrix Composites (MMCs)) Additive Manufacturing, Welding, and Characterization.
- Computational Materials Engineering (CME), Data Science, Machine learning, Predictive Modeling, Neural Networks, FEM simulation, FEM for Manufacturing Processes

RESEARCH EXPERIENCES

Study on the wear behavior of NiAl-TiC-TiB_2 composite produced by the combustion synthesis process

2020 - present | *Supervisors: Prof. M. Adeli, Prof. M. Soltanieh, Prof. H. Saghafian*
School of Materials and Metallurgy Engineering, IUST

- **Fabricated NiAl / TiC-TiB_2 composites** using a combustion synthesis process
- **Enhanced** composite hardness profile due to **even distribution** of TiC-TiB_2 phases
- **Demonstrated** superior wear resistance in composites with higher TiC-TiB_2 using **Sliding wear** tests
- **Trained** an **ANN** model to **predict** the properties of composite with various TiC-TiB_2 content.

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

2021 - present | *Supervisor: Prof. M. Adeli, Prof. Seyed Hossein Seyedein*
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 **(EIS[1])** 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.

[1] Electrochemical Impedance Spectroscopy

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

2018 - 2020

Supervisors: Prof. M. Adeli, Prof. M. Soltanieh
School of Materials and Metallurgy Engineering, IUST

- Fabricated VCN-150 steel **joints and then** WC-Co / VCN-150 **dissimilar joints** via **combustion synthesis** in **Ni-Ti** compound
- **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)

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

2015 - 2017

Supervisors: Prof. M. S. Rafiaei
Department of Materials Engineering, IUT

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

PUBLICATIONS

JOURNAL ARTICLES

- F. Soleimani, M. Adeli, M. Soltanieh, H. Saghafian, A. Karimi, **Fabrication and wear behavior of TiC/TiB_2-reinforced NiAl intermetallic matrix composites**, Ceramics International, (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, https://doi.org/10.1016/j.jmapro.2022.03.043
- 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

CONFERENCE PAPER

- 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, https://civilica.com/doc/963690/

HONORS AND AWARDS

Patent (In process): Design, Manufacture, and Implement an intelligent atmosphere supply system for sinter furnaces.

- **Facilitated** the atmosphere-controlling process of box furnaces
- **Recognized as a key contributor to problem-solving** skills and **innovation**

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

- Issued by the Ministry of Science, Research and Technology due to national entrance exam for 2 years of M.Sc. (2017)

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

- Issued by Ministry of Science, Research and Technology due to national entrance exam for 4 years of B.Sc. (2013)

TEACHING EXPERIENCES

Graduate Teaching Assistant (Metallurgical Processes Laboratory-Hydrometallurgy, Pyrometallurgy)

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

Metallurgical Laboratory Manager

Sep2021-present | *SEPAHAN FOOLAD ATASHGAH (STEEL CASTING)*

- **Teamwork leadership** in the **research and technological** development group.
- **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 characterization** equipment (SEM, OM), **OES**[2], Mechanical testing Equipment (**Fatigue**, **Micro-Hardness**), and NDT[3] analysis approaches.
- Customer **Scientific consultation** to make the best decision in **choosing a metallurgical analysis**.

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

[2] Optical Emission Spectroscopy
[3] Non-Destructive Test

English: Fluent, **TOEFL (iBT):** On November 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	• Acquired through my experience as a **Materials selection consulting specialist** in Hamiran Co. and My experience as an **English and Math tutor**
Managerial skills	• Metallurgical laboratory **manager** (currently responsible for a team of **14 people**)
Computer skills	• ANSYS, Tecplot, HighScore (plus), SOLIDWORKS, Origin, Minitab, ZsimpWin, EC-Lab, Microsoft Office, **Python** programming language

CERTIFICATES

- ***TEM*** (Coursera, EPFL)
- ***Python*** (Coursera, University of Michigan)
- ***Conference Presentation*** (International **Imat** Conference)
- ***Data science*** (Coursera, IBM)
- ***Materials Data Science*** (Coursera, Georgia Tech)
- ***HSE*** certificate (IUST)

REFERENCES

- Dr. Mandana Adeli, Assistant Professor of Materials and Metallurgical Engineering, IUST, **adelim@iust.ac.ir**
- Dr. Mansour Soltanieh, Professor of Materials and Metallurgical Engineering, IUST, **mansour_soltanieh@iust.ac.ir**
- Dr. Seyed Hossein Seyedein, Professor of Materials and Metallurgical Engineering, IUST, **seyedein@iust.ac.ir**
- Dr. Seyed Mahdi Rafiaei, Associate Professor of Materials and Metallurgical Engineering, IUT, **rafiaei@gut.ac.ir**