



CURRICULUM VITAE

ALIREZA KARIMI

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EDUCATION

- 2017-2020 | *Iran University of Science and Technology (IUST)* *TEHRAN, IRAN*
M.Sc. in Materials Engineering
- **GPA:** 81 / 100
 - **Thesis Title:** Investigating the parameters affecting the joining of tungsten carbide to low-alloy steel using combustion synthesis reactions of Ni-Ti powder mixture
 - **Supervisors:** Prof. M. Adeli (adelim@iust.ac.ir) and Prof. M. Soltanieh (mansour_soltanieh@iust.ac.ir)
- 2013-2017 | *Golpayegan College, Isfahan University of Technology (IUT)* *ISFAHAN, IRAN*
B.Sc. in Metallurgy and Materials Engineering
- **GPA:** 73 / 100 (via 142 credits), last two years = 90 / 100
 - **Thesis Title:** Production of amorphous Fe-Ni-Cr coatings by electric deposition process
 - **Supervisor:** Prof. S. M. Rafiaei (rafiaei@gut.ac.ir)

RESEARCH INTERESTS

- Advanced Materials (e.g., Shape Memory Alloys, Metal Matrix Composites (MMCs), Refractory Metals, Titanium Alloys, Metal Foams, Energy Storage Materials) Synthesis, Welding, Processing and Characterization
- Additive Manufacturing (3-D Printing)
- Data analysis and data science
- Numerical Modelling (FEM, CFD)

RESEARCH EXPERIENCES

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

- 2021 - Now | *Supervisors: Prof. M. Adeli*
School of Materials and Metallurgy Engineering, IUST
- Fabricated **TiAl Intermetallic compounds** with various MAD via SHS process
 - Performed **microstructural characterization** (SEM) of TiAl samples with various MADs.
 - Investigated **corrosion behavior** of TiAl samples with **various MAD**

Fabrication and wear behavior of TiC/TiB₂-reinforced NiAl intermetallic matrix composites

- 2020 - Now | *Supervisors: Prof. M. Adeli, Prof. M. Soltanieh*
School of Materials and Metallurgy Engineering, IUST
- fabrication of **NiAl-matrix** composites using combustion synthesis with **TiC/TiB₂** reinforcements.

- **XRD** and **SEM** confirm **uniform** TiC-TiB₂ distribution, **boosting hardness** and **reducing density**
- **Sliding wear** tests and **ANN modeling** demonstrate superior wear resistance in composites with higher TiC-TiB₂ content

Joining of tungsten carbide to low carbon steel by using combustion synthesis reactions

2018-2020 | Supervisors: Prof. M. Adeli, Prof. M. Soltanieh
School of Materials and Metallurgy Engineering, IUST

- Fabricated WC-Co / VCN-150 **dissimilar joint** 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 characterization** of joint layer using (**SEM**), **mechanical characterization** of joint using **Shear strength** test and **Micro hardness** Profile test and phase analysis of interlayer via **XRD** techniques

Investigating the possibility of establishing steel-steel joints using combustion synthesis reactions

2018-2019 | Supervisors: Prof. M. Adeli, Prof. M. Soltanieh
School of Materials and Metallurgy Engineering, IUST

- **Fabricated** VCN-150 steel **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 for the sake of decreasing interlayer **porosity**
- Analyzed joint **microstructure** and **interlayer** phases using **SEM** and **XRD**

Effect of space holder materials on the porosity of synthesized Ni-Ti products

2018-2019 | Supervisors: Prof. M. Adeli
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 | Supervisors: Prof. M. S. Rafiaei
Department of Materials Engineering, IUT

- Investigated **current density's** impact on coating **thickness** and **structure** (amorphous/crystalline)

PUBLICATIONS

JOURNAL ARTICLES

- F. Soleimani, M. Adeli, M. Soltanieh, H. Saghaian, A. Karimi, **Fabrication and wear behavior of TiC/TiB₂-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](https://doi.org/10.1001.1.22285946.1399.11.41.8.2)

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

- **Awarded governmental full scholarship (Tuition Waiver) and governmental fund (Research Grant) from Iran University of Science and Technology**
 - Issued by Ministry of Science, Research and Technology · Sep 2017
 - Awarded to the results of national entrance exam for 2-3 years of M.Sc.
- **Awarded governmental full scholarship (Tuition Waiver) and governmental fund (Research Grant) from Isfahan University of Technology**
 - Issued by Ministry of Science, Research and Technology · Sep 2013
 - Awarded to the results of national entrance exam for 4-5 years of B.Sc.

TEACHING EXPERIENCES

Graduate Teaching Assistant of Metallurgical Process Laboratory (Sept 2017 – Jan 2018)

- **Instructor:** Prof. M. Adeli (adelim@iust.ac.ir),
- School of Materials and Metallurgy Engineering, Iran University of Science and Technology

WORK EXPERIENCES

Research Assistant

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| Sep2018-Now | IRAN UNIVERSITY OF SCIENCE AND TECHNOLOGY | ISFAHAN, IRAN |
| | <ul style="list-style-type: none"> • As a diligent research assistant, I actively contributed to data analysis and interpretation. • I assist in literature reviews, experiment design, and research documentation. • Detail-oriented and proactive, I thrive in a collaborative research environment. | |

Metallurgical Laboratory Manager

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|-------------|--|---------------|
| Sep2021-Now | ATASHGAH STEEL COMPANY | ISFAHAN, IRAN |
| | <ul style="list-style-type: none"> • Teamwork leadership in the research and technological development group • Performed workshops for laboratory members to improve their laboratory skills • Supervision of equipment's calibration | |

Metallurgical Laboratory Expert

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|---------------|---|--------------|
| 2021(Feb-Sep) | HAMIRAN STEEL COMPANY | TEHRAN, IRAN |
| | <ul style="list-style-type: none"> • Acquired Hands-on experience with microstructural characterization equipment (SEM, FESEM, EBSD, OM), Optical Emission Spectroscopy (Foundry Master), Universal tensile testing (Gotech) | |

Patent Engineer (USPTO)

2020(Jan-Oct)

IDI COMPANY

TEHRAN, IRAN

- **Preparing** and prosecuting patent applications related to **materials science** inventions.

Scientific Student Administrator (Volunteer)

2015-2017

SCHOOL OF MATERIALS AND METALLURGY ENGINEERING, IUT

ISFAHAN, IRAN

- **Organized** extracurricular activities and **administrated** industrial visits for students.

Engineering Internship

2016(Apr-Sep)

ISFAHAN STEEL COMPANY

ISFAHAN, IRAN

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

TECHNICAL SKILLS AND CERTIFICATES

Laboratory Skills

- **Hands-on experience** working with **microstructural characterization equipment** (Field Emission Scanning Electron Microscope, Scanning Electron Microscope, Optical Microscope, Laser Microscope), **Optical Emission Spectroscopy** (Foundry Master), **Universal tensile testing** (Gotech), **Universal Hardness Tester**, and **pyrometallurgy lab equipment** (e.g., tube furnace & induction furnace)

Certificates

- **Transmission electron microscopy** for materials science (EPFL)
- **Programming for Everybody (Getting Started with Python)** (University of Michigan)
- **Conference Presentation** certificate (8th International **Imat** Conference)
- **What is Data Science?** (IBM)
- **Materials Data Science and Informatics** (Georgia Institute of Technology)
- **HSE** certificate (Iran University of Science and Technology)

COMPUTER SKILLS

Engineering Software

- ANSYS, Tecplot
- HighScore (plus)
- Microsoft Office
- EC-Lab
- SOLIDWORKS
- Origin
- Minitab
- Zsim

Programming Language

- Python

LANGUAGE SKILLS

Persian: Native Language

English: Fluent

- **TOEFL (iBT):** On September 2023

REFERENCES

- Dr. Mansour Soltanieh, Professor of Materials and Metallurgical Engineering, Iran University of Science and Technology, mansour_soltanieh@iust.ac.ir
- Dr. Mandana Adeli, Assistant Professor of Materials and Metallurgical Engineering, Iran University of Science and Technology, adelim@iust.ac.ir
- Dr. S. M. Rafiaei, Assistant Professor of Materials and Metallurgical Engineering, Golpayegan College of Engineering, Isfahan University of Technology, rafiaei@gut.ac.ir