

Hossein Mahani

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Research Interests

- Additive manufacturing (metal and polymer 3d printing)
- Nanocomposites
- Powder Processing
- Materials characterization
- Finite Element Analysis

Education

- **Isfahan University of Technology**, Isfahan 2017-2020
Msc in mechanical Engineering GPA: 3/4

Thesis Project: Study of mechanical, thermal, and structural properties of nanocomposite filament of polylactic acid/ thermoplastic starch/ nanoclay used in 3D printing

Thesis score: A⁺

- **Islamic Azad University of Najafabad**, Isfahan 2013-2017
Bsc in mechanical Engineering GPA: 3/4

Publications

Journal:

1. **Mahani H**, Karevan M, Safavi M. Comparative performance of fused deposit modeling 3D-printed and injection molded polylactic acid/thermoplastic starch/nanoclay bio-based nanocomposites. *Polym Adv Technol*. 2023; 34(6): 1901-1917.
Link: <https://doi.org/10.1002/pat.6019>
2. **Mahani H**, Karevan M, Abtahi SA, Khorasani SN. Spherical polystyrene/zinc oxide nanocomposite powder fabricated by continuous process chain of melt mixing and indirect heating. *Powder Technology*. 2024 Aug 1;444:120010.
Link: <https://doi.org/10.1016/j.powtec.2024.120010>
3. **(under preparation)** Characterization and numerical modeling of titanium alloy scaffolds for spinal cage implants manufactured by 3D printing

Conference:

1. **Mahani, H** and KAREVAN, M and SAFAVI, M, 1399, Characterization of Biodegradable Thermoplastic Starch/Poly Lactic Acid/NanoClay Filaments Used in 3D Printing, The 7th International Conference on Composites: Characterization, Fabrication and Application, Tabriz
Link: <https://civilica.com/doc/1226031>

Patents

1. Thermoplastic polymer nanocomposite powder for use in 3D printing technology, selective laser sintering, and other melt compounding methods
IR patent No. 103189. Dec 21, 2020.
2. Lightweight rail guideplate with graded variable width capability
IR patent No. 109293. May 24, 2023.

Academic Experiences

- **Research Assistant** (*under the supervision of Dr. Karevan*) **Sep 2018 – Sep 2020**

The objectives of the research were material characterization through measuring mechanical, thermal and structural properties of a wide range of laboratory devices and also processing of nanocomposites for the intended application.

- **Teaching Assistant** (*under the supervision of Dr. Karevan*) **Jan 2019 – May 2020**

Course: Statics and Mechanics of Materials

- **Poster Representation** **Dec 2019**

Title: Micropowders Processing for Additive Manufacturing and Pharmaceutical Materials

- **Design and Fabrication Downer Tower** (*under the supervision of Dr. Karevan*) **July 2019 - Dec 2019**

As a team leader, a lab-scale Tower was made in order to heat polymer powders and change their geometry to spheres.

Work Experiences

- **R&D Engineer** (*Hejrat Naghshe Jahan Co.*) **Jan 2021 – Aug 2023**

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|---|--|
| - Quality Assurance | - Design and fabrication measuring gauge |
| - CNC programming | - CAD/CAM |
| - Simulation of Manufacturing Processes | - Design and modelling new parts |

Technical Skills

- Modelling by SolidWorks and Autodesk Inventor (Part, Drawing, Assembly, Surface design CAD)

- Abaqus simulation
- Microsoft Office (Word, Excel, PowerPoint)
- OriginPro (Plotting curves for research)
- FDM 3d printing (Design for 3d printing, Control parameters, material selection, filament fabrication)
- CNC Programming Manual
- Design and analysis mechanical and structural properties of lattice structures
- Fabrication of spherical nanocomposite powder
- Performing lab tests, characterization, and analysis:
 - Thermal Tests (DSC, TGA)
 - Mechanical Tests (Tensile Test, Compression Test, Flexural Test, Impact Test)
 - Morphological Tests (MFI, Density)
 - Processing methods (Extrusion, Injection molding, Rolling, Hot press)

Certificates

Prototyping with 3d printing FDM (Nu. 7222-41-033-1) <i>Iran Technical & Vocational Training Organization</i>	2018
Advanced Autodesk Inventor (Nu. 311830410100171) <i>Iran Technical & Vocational Training Organization</i>	2020
SolidWorks Advanced Modelling (Nu. 311830410100181) <i>Iran Technical & Vocational Training Organization</i>	2018
CNC Milling (Nu. 8-33/86/2/3) <i>Iran Technical & Vocational Training Organization</i>	2019
Welding Visual Testing (VT) level II (Nu. 311730110070001) <i>Iran Technical & Vocational Training Organization</i>	2019
Heat Treatment of Metals and the Key to Steel (Nu. 311930330030001) <i>Iran Technical & Vocational Training Organization</i>	2019
Metallography (Nu. 311730330020001) <i>Iran Technical & Vocational Training Organization</i>	2021
Design for Manufacturing and Assembly (DFMA) Workshop <i>Isfahan University of Technology, Mechanical Engineering Department</i>	2018

Awards

Second Rank in “**Feasibility of 3d printing Heat Exchangers**” competition **2020**
(Number: 498394-15/15171)
Iran's National Elites Foundation

Second rank in “**Design a Specific Bioprinter Nozzle**” competition **2020**
Iran's National Elites Foundation

Languages

IELTS

Overall: 7 (L: 8 , R: 6.5, W: 6, S: 6.5)

GRE General Test

Verbal: 154, Quantitative: 161, Writing: 3.5

References

1. Dr. Mehdi Karevan

Assistant Professor of Mechanical Engineering, Isfahan University of Technology
([Link](#))

2. Dr. Saied Nouri Khorasani

Professor of Chemical Engineering, Isfahan University of Technology ([Link](#))

3. Dr. Ahmad Kermanpur

Professor of Materials Engineering, Isfahan University of Technology ([Link](#))

4. Dr. Mohsen Safavi

Professor of Mechanical Engineering, Isfahan University of Technology ([Link](#))