

Kiarash Farajzadehahary

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 San Sebastian, Spain
 July 20, 1994



✓ SUMMARY

Polymer scientist and machine learning researcher combining experimental and computational expertise to develop chemistry-informed models that bring polymer knowledge to AI and deploying it for reactor control, with proven track record in collaborative R&D and high-impact publications.

🎓 EDUCATION

Doctor of Philosophy in Applied Chemistry and Polymeric Materials

Dept. of Polymer Sci. & Tech., Faculty of Chemistry, University of the Basque Country

May 2022 – Present

San Sebastian, Spain

Thesis Evaluation: [To be determined]

Thesis: Utilizing machine learning in emulsion polymerization

Supervisors: Prof. Nicholas Ballard, Prof. José M. Asua

Master of Science in Polymer Engineering, Polymer Processing

Dept. of Polymer Engineering, School of Chemical Engineering, University of Tehran

Sep. 2017 – Oct. 2020

Tehran, Iran

Cum. GPA: **18.44/20 (4.0/4)**

Thesis: Compatibilization of PHB/PCL blend: Morphological, rheological, mechanical, and thermal study

Supervisors: Prof. Mohammad Najafi, Prof. Babak Kaffashi; Advisor: Prof. Shervin Ahmadi

Bachelor of Science in Polymer Engineering, Polymer Industries

Dept. of Polymer Engineering, School of Chemical Engineering, University of Tehran

Sep. 2012 – Feb. 2017

Tehran, Iran

Cum. GPA: **15.39/20 (3.0/4)**

Research: Investigation on restorative dental resin composites

Supervisor: Prof. Mohammad Najafi

💼 WORK EXPERIENCE

Visiting Researcher

LCPO, University of Bordeaux

Feb. 2026 – Apr. 2026

Bordeaux, France

- Develop polymer chemistry informed neural networks (PCINNs) for RAFT polymerization
- Implement optimization to guide automated flow reactor experiments toward optimal conditions

Research Assistant (RA)

POLYMAT, Institute for Polymer Materials

May 2022 – Present

San Sebastian, Spain

- Conduct research on machine learning applications in emulsion polymerization
- Develop neural network models and reinforcement learning algorithms for reactor control
- Design and execute experiments using reaction calorimetry and characterization techniques
- Prepare manuscripts for peer-reviewed journals, and present findings at international conferences
- Mentor undergraduate and master's students in laboratory techniques and computational methods

Software Instructor/Tutor (Remote)

Maktabkhooneh Online Platform

Mar. 2019 – Present

Tehran, Iran

- Autodesk Moldflow: Prepare course materials, assist students, and assess final projects

Teaching Assistant (TA)

University of Tehran

Sep. 2016 – Dec. 2020

Tehran, Iran

- Prepared and presented lectures, held discussion sessions, designed and graded assignments and exams
 - Application of Computers in Polymer Engineering (Ph.D.), Spring 2019
 - Advanced Polymerization Process Engineering (Master's), Fall 2018–20
 - Principles of Polymerization Engineering (Bachelor's), Fall 2017–19
 - Industrial Resins Engineering (Bachelor's), Fall 2016–17
- Supervised laboratory sessions and assisted in preparation and execution of experiments
 - General Chemistry Laboratory, spring 2018–19

Quality Control Laboratory Technician

Khosh Paint & Resin Company

May 2016 – Aug. 2016

Tehran, Iran

- B.Sc. internship: Conducted physical and chemical analyses on paint and resin products

SKILLS

Language

- Persian: Native
- Arabic: Elementary
- Spanish: Intermediate
- English: Fluent

Soft Skills

- Interdisciplinary Teamwork
- Self-directed Research
- Scientific Communication
- Mentoring & Teaching
- Adaptability & Flexibility
- Time Management

Computer

- **Software Applications**
 - Office: Word, Excel, PowerPoint, Visio
 - Design: Moldflow, Inventor, AutoCAD
 - Graphic: Blender, Photoshop, Illustrator
 - Others: Origin, ChemDraw, Mendeley, Aspen
- **Programming & Computing**
 - Languages: Python, MATLAB, LaTeX, Bash
 - HPC: Slurm, Linux clusters, parallel computing
- **Machine Learning**
 - Frameworks: TensorFlow, PyTorch, Scikit-learn
 - Deep Learning: Neural Networks, CNN, RNN, GAN
 - Other: Ensemble, Boosting, Reinforcement Learning

Technical

- Reaction Engineering
- Reaction Calorimetry
- Injection molding
- Extrusion process
- Mechanical testing (Tensile, Shear, Creep)
- Chromatography (GC, GPC, AF4)
- Thermal analysis (DSC, DMTA, TGA)
- Electron microscopy (SEM, TEM)
- Spectroscopy (NMR, FTIR)

PUBLICATIONS

- [1] Farajzadehahary, Kiarash, Hamzehlou, Shaghayegh, Ballard, Nicholas. "Adding Machine Learning to the Polymer Reaction Engineering Toolbox". In: *Progress in Polymer Science* (2025), p. 102029.
- [2] Naderi, Mehdi, Farajzadehahary, Kiarash, Melchin, Timo, Weitzel, Hans-Peter, Leiza, Jose R, Asua, José M. "Alkali-Soluble Resins as pH-Responsive Protective Colloids". In: *ACS Applied Materials & Interfaces* 17.30 (2025), pp. 43750–43760.
- [3] Ballard, Nicholas, Farajzadehahary, Kiarash, Hamzehlou, Shaghayegh, Mori, Usue, Asua, José M. "Reinforcement learning for the optimization and online control of emulsion polymerization reactors: Particle morphology". In: *Computers & Chemical Engineering* 187 (2024), p. 108739.
- [4] Ballard, Nicholas, Larrañaga, Jon, Farajzadehahary, Kiarash, Asua, José M. "Polymer chemistry informed neural networks (PCINNs) for data-driven modelling of polymerization processes". In: *Polymer Chemistry* 15.44 (2024), pp. 4580–4590.
- [5] Farajzadehahary, Kiarash, Hamzehlou, Shaghayegh, Ballard, Nicholas, Asua, José M. "The hidden secrets of the average number of radicals per particle (\bar{n}) and their implications in control of emulsion polymerization reactors". In: *Chemical Engineering Journal* 487 (2024), p. 150681.
- [6] Farajzadehahary, Kiarash, Telleria-Allika, Xabier, Asua, José M, Ballard, Nicholas. "An artificial neural network to predict reactivity ratios in radical copolymerization". In: *Polymer Chemistry* 14.23 (2023), pp. 2779–2787.

RECENT CONFERENCES & REVIEWS

Conference Presentations

- [1] Farajzadehahary, Kiarash. "Machine Learning Approaches for the Modeling and Control of Complex Polymerization Processes". In: *European Polymer Congress 2025 (EPF 2025)*. Oral presentation. Groningen, Netherlands, June 2025.
- [2] Farajzadehahary, Kiarash. "Polymer Chemistry Informed Neural Networks for Modeling of Polymerization Reactions". In: *13th PhD-Workshop on Polymer Reaction Engineering (WPPRE 2025)*. Oral presentation. Prague, Czech Republic, May 2025.
- [3] Farajzadehahary, Kiarash. "Machine learning models for predicting key properties in free radical emulsion polymerization". In: *Artificial Intelligence for Advanced Materials (AI4AM2025)*. Conference Poster. San Sebastián - Donostia, Spain, Apr. 2025.
- [4] Farajzadehahary, Kiarash. "Navigating Polymerization Complexity with Artificial Intelligence: A New Era of MWD Control and Optimization". In: *12th PhD-Workshop on Polymer Reaction Engineering (WPPRE 2024)*. Oral presentation. Lyon, France, Oct. 2024.

Peer Review Activities

- [1] *Chemical engineering journal*. In: (Feb. 2026). Elsevier B.V., ISSN: 1385-8947.
- [2] *Digital Discovery*. In: (Oct. 2025). Royal Society of Chemistry, ISSN: 2635-098X.
- [3] *Nanoscale*. In: (May 2024). Royal Society of Chemistry, ISSN: 2040-3372.

REFERENCES

References available upon request.