

Iliya Baktash

Iran University of Science and Technology, Department of Mechanical Engineering



Baktashiliya@gmail.com



iliyaBaktash.ir



www.linkedin.com/in/iliya-baktash

Education

Iran University of Science and Technology

Master of Science Degree in Mechanical Engineering- Energy Conversion (Sept 2023-Sept 2025)

Thesis title: Technical, Economic, and Environmental Analysis of a Photoelectrochemical System for Hydrogen Production and Storage (Supervisor: Dr. Ghandehariun)

Grade: 16.57/20.00 | Relevant Courses: Advanced Energy Conversion, Computational Fluid Dynamics, Turbulence, Boundary Layer Theory, Convective Heat Transfer, Advanced Fluid Mechanics.

Iran University of Science and Technology

Bachelor Degree in Mechanical Engineering (Sept 2019-Sept 2023)

Thesis title: Application of machine learning in hydrogen production system using solar energy (Supervisor: Dr. Ghandehariun)

Grade: 17.54/20.00 | Relevant Courses: Renewable energies, Introduction to Computational Fluid Dynamics, Internal Combustion Engines, Power Plants, Turbomachinery.

National Organization for Development of Exceptional Talents (Shahid Soltani 4)

Diploma in Mathematics (Sept 2016-Sept 2019)

Grade: 19.76/20.00

Research Interests

- Renewable Energy Systems
- Hydrogen Production and Storage
- Energy Management
- Computational Fluid Dynamics
- Data-driven Fluid Mechanics
- Turbulence Modeling

Experience

Mechanical & Piping Engineer

Tavazon Farab Co.

Full Time 2025 – Present

Designing pipe and equipment supports for wastewater recycling plant.

Piping wastewater recycling plant for Tabriz petrochemical Co and Arfa steel Co.

Design & Piping Engineer

TTS Group

Full Time 2023 – 2024

Designing waste separation system in Sari.

Piping some parts of the waste-to-power power plant in Sari.

Intern

Moshanir Power Engineering Services Co

Manjil Green Power Generation Co

Part-time 2020 and 2021

Research Assistant

Iran University of Science and Technology

Part-time 2022 – Present

Applied Sustainable Energy Research Laboratory (ASERL)

Supervisor: Dr. Samane Ghandehariun

Application of machine learning in hydrogen production

Hydrogen storage, including metal hydrides and cryogenics

Optimizing Renewable Energy Systems: Tech, Environmental & Economic

Teaching Assistant

Iran University of Science and Technology

Part-time 2022 – Present

Fluid Mechanics I presented by Dr. Hojat Ghasemi

Thermodynamics II presented by Dr. Samane Ghandehariun

Mechanics of Materials II presented by Dr. MirSaeed Safizade

Publications

- Baktash I, Mohebi H, Ghandehariun S. “Real-Data-Driven Machine Learning Framework for Solar-Based Hydrogen Production” (doi.org/10.1016/j.rineng.2026.111807)
- Ahmadi L, Baktash I, Heydari Moghaddam H, Heidari A, Alhosseini S, Zahedi R. “Optimizing Waste Heat Recovery in Cryptocurrency Mining: A Dual Approach of Building Heating Integration and ORC Power Generation” (doi.org/10.1016/j.csite.2026.107826)
- Baktash I, Ghandehariun S, Naterer G.F. “Modeling of Solar-Driven Hydrogen Production and Storage in a Photoelectrochemical System with Porous Metal Hydride Cathodes” (under review)
- Baktash I, Ghandehariun S. “Techno-Economic Analysis of a Photoelectrochemical Hydrogen Production System with Integrated Porous Metal Hydride Storage” (under review)

Projects

Photoelectrochemical Hydrogen Production and Storage System

Simulation and analysis of a photoelectrochemical (PEC) hydrogen production system with a metal hydride cathode using MATLAB, life cycle assessment with SimaPro, economic and technical optimization using a Genetic algorithm, mathematical modeling with validation, and performance comparison with PV-electrolyzer (PVE) systems.

Sama PV Power Plant

Simulation and analysis of Sama Zahedan PV power plant using PVsyst and MATLAB: life cycle assessment, economic evaluation (payback, LCOE, total cost), hydrogen production via PEM electrolyzer, and next-day prediction/optimization of temperature, GHI, power, and hydrogen output using Python-based machine learning.

Piping Waste-to-Energy Power Plant

Modeled the piping system of the Sari Waste-to-Energy Power Plant in 3D using PDMS and performed stress analysis for pipes, routes, and fittings using CAESAR II. Reviewed P&ID drawings, prepared line lists, and ensured consistency with project specifications. Coordinated layouts with process and design teams, managed Piping Material Specifications (PMS), and supported Material Take-Offs (MTO) as well as the generation and checking of isometric drawings for fabrication and construction.

Wastewater Treatment Cycle Plant

Contributed to the detailed engineering and construction of industrial wastewater treatment plants for Tabriz Petrochemical Company (670 m³/h) and Arfa Steel Company (290 m³/h). Designed piping layouts, pipe supports, and equipment supports, and developed 3D models of RO and UF skids using SolidWorks. Performed structural analysis of skids and supports using SolidWorks Simulation, created 3D piping models in PDMS, and conducted piping stress analysis of critical piping systems using CAESAR II. Prepared engineering documentation including Line Lists, Piping Material Specifications, Manual Valve Lists, Skid Drawings, and Material Take-Offs. Performed quality control inspections of skid fabrication, pipe supports, piping installation, and protective painting procedures to ensure compliance with project specifications, engineering standards, and inspection requirements.

Designing Conveyor System

Designed, analyzed, and implemented 12-line conveyors for Sari Waste Separation System: 3D modeling, FEA, MATLAB-based power and belt calculations, and construction documentation.

PIV Methods for Turbulence Analysis

Presented a seminar on Particle Image Velocimetry (PIV) techniques in the Turbulence course, analyzing flow field measurements for turbulent jet flows using MATLAB for data post-processing. Demonstrated application of PIV in validating CFD models, enhancing understanding of turbulence structures.

Boundary Layer Analysis and Convective Heat Transfer

Simulated velocity and thermal boundary layers on flat and sloped surfaces using MATLAB; visualized streamlines and heatlines to optimize convective heat transfer. Analyzed the impact of surface geometry on heat transfer efficiency, validated with theoretical correlations.

Waste Heat Recovery in Cryptocurrency Data Center with ORC

Conducted Exergy, economic, and LCA analysis of Organic Rankine Cycle (ORC) for waste heat recovery in a cryptocurrency data center using MATLAB and SimaPro, reducing energy costs by 12%. Optimized ORC design for 15% improved power generation efficiency, supporting sustainable data center operations.

Numerical Analysis of Nanofluids in Automotive Radiators

Simulated heat transfer enhancement using Al₂O₃ and CuO nanofluids at varying Reynolds numbers in ANSYS Fluent.

CFD Modeling of Vertical Axis Wind Turbine (Savonius Turbine)

Modeled turbulence for a Savonius turbine using the k-omega method and moving reference frame in ANSYS Fluent.

CFD modeling of a 19-tube bundle flow straightener

Simulating a 19-tube bundle flow straightener to reduce the swirl in the interior and exterior region using the K-Epsilon method in Ansys Fluent.

Languages

- **English: Full Proficiency** IELTS Overall score: 7.5 Listening: 7.5 Reading: 8.5 Writing: 6.5 Speaking: 7
- **French: Pre-intermediate**
- **Persian: Native**

Skills

CAD:

SolidWorks, Autocad

Piping:

PDMS, CAESAR II, AFT impulse, PIPENET, Pipe flow Expert

Electrical:

Proteus, Arduino

CAE:

ANSYS, ABAQUS

Simulation:

PVSyst, HOMER, PVSOL, HTRI, Sidewinder, AC3, ProNest, SimaPro

Microsoft Office:

Excel, Word, PowerPoint, Project

Programming:

Python, MATLAB, C/C++, C#, EES

CAM:

SolidCam, Powermill

Soft Skills:

Time Management, Teamwork, Problem-Solving

Honors and Awards

Offered direct admission for Master's in Energy Conversion Engineering at Iran University of Science and Technology.

Offered direct admission for PhDs in Energy Conversion Engineering at Iran University of Science and Technology.

Ranked among the top 5 percent of all Bachelor's students in Mechanical Engineering at Iran University of Science and Technology.

Ranked among the top 10 percent of all Master's students in Mechanical Engineering at Iran University of Science and Technology.

Ranked among the top 3 of all Diploma Students in Shahid Soltani 4 High School.

References

Dr. Samane Ghandehariun:

Assistant Professor at IUST

Email: Samane_ghandehariun@iust.ac.ir

Dr. Rohollah Talebitooti:

Professor at IUST

Email: rtalebi@iust.ac.ir

Dr. Mir Saeed Safizadeh:

Associate Professor at IUST

Email: Safizadeh@iust.ac.ir