Saeid Bahrami Eynolghasi

HPC CFD Researcher | Fluid Mechanics Engineer | US Patent Inventor

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Profile Summary

Innovative Fluid Mechanics Engineer and HPC CFD Researcher with an M.Sc. from Grenoble INP. Experienced in conducting advanced computational research at the Barcelona Supercomputing Center (BSC) and recognized as an inventor with a registered US Patent (US 11,124,953). Passionate about bridging the gap between mathematical theory, High-Performance Computing, and real-world fluid dynamics applications. Seeking opportunities to contribute to cutting-edge CFD research and development in an academic or highly innovative industrial setting.

Patents

Anti-Leak System for Sanitary Appliances (US Patent)

September 21, 2021

Link: https://patents.google.com/patent/US11124953B2/en

Patent No.: US 11,124,953 B2. A novel device for solving permeability problems

A device for solving the Permeability problem of Sanitary Products

2015

Iran's Invention Office, Patent Reg. No.: 87107

Removing the Traditional Sanitary's Permeability Problem of Iranian Facilities

2013

Iran's Invention Office, Patent Reg. No.: 81620

Device Installable in or on Socket without Considering the Installation Place of Phase and Neutral for Providing Full Safety Against Electrical Shock

2003

Iran's Invention Office, Patent Book No.: 29180

Education

Master of Fluid Mechanics

Branch: Computational Fluid Dynamics
University: Grenoble Institute of Technology (Grenoble INP)
Grenoble, France
2016 - 2017

Graduated from a highly competitive international Master's program, bridging advanced theoretical physics with applied engineering.

- **Core Focus:** Specialized heavily in Computational Fluid Dynamics (CFD), turbulence modeling, and energetic systems, executing hands-on numerical projects.
- **Global Environment:** Thrived in a multicultural and multinational academic setting, developing strong adaptability, cross-cultural communication, and collaborative skills in international teams.
- **Practical & Research Experience:** Completed a rigorous internship focused on heat and mass transfer in porous media at physics institute of Rennes, effectively translating academic knowledge into practical engineering solutions.

Master of Mechanical Engineering

Branch: Energy Conversion
University: Islamic Azad University
Iran
2010 - 2012

- **Specialization:** Energy Conversion and thermal sciences, with a strong emphasis on HVAC system simulations and energy efficiency.
- **Key Achievements:** Developed foundational expertise in thermodynamics and numerical analysis, laying the groundwork for subsequent advanced research in CFD.

Bachelor of HVAC/R (Heating, Ventilation, Air-conditioning, Refrigeration)

University: Islamic Azad University
Iran
2008 - 2010

- Acquired a solid foundation in fluid dynamics, heat transfer, and mechanical design, combined with practical, hands-on projects in Heating, Ventilation, Air-Conditioning, and Refrigeration (HVAC/R) systems.

Associate in Refrigeration and Air-Conditioning

University: Islamic Azad University
Iran
2005 - 2008

Research

Conceptual Design of an Infundibular Tunnel for Turbine Efficiency

2025

- Conducted independent theoretical research and preliminary fluid dynamics analysis on a novel infundibular tunnel concept.
- Aimed to significantly increase the hydrodynamic and aerodynamic efficiency of wind, underwater, and hydraulic turbines.
- Currently finalizing the technical documentation for future patent registration and prototyping.

M.Sc. Thesis: Heat and Mass Transfer in Porous Media

Grenoble INP / Physics Institute of Rennes
2017

- Academic dissertation aimed at modeling and analyzing the thermodynamic behavior of fluids inside porous structures.
- Extracted and processed experimental data to formulate new theoretical correlations.
- Defended the research successfully as the final milestone for the Master's degree in Fluid Mechanics

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Projects

Computational Fluid Dynamics (CFD) & Numerical Simulations

For: Interdisciplinary Research Projects

- **Programmed and executed** fluid mechanics simulations by solving **Navier-Stokes** and related complex Partial Differential Equations (PDEs).
- **Developed robust numerical solvers** utilizing the **Finite Difference Method (FDM)** as the core computational framework, supplemented by practical experience with **Finite Element Method (FEM).**
- **Ensured algorithm stability and accuracy** in transient (time-dependent) simulations by rigorously applying convergence criteria, notably the **Courant-Friedrichs-Lewy (CFL) condition.**
- **Delivered interdisciplinary projects** through advanced mathematical modeling, algorithm design, and code optimization.

Smart Device Control using Arduino

For: Independent Projects

- Designed and developed multiple projects for controlling electrical devices.
- Programmed Arduino microcontrollers to interface with various hardware components.
- Implemented smart control systems, enabling remote operation and monitoring of devices via smartphones.

Advanced Image Processing and Restoration

For: Academic / Independent Projects

- Completed multiple complex image processing projects using MATLAB.
- Developed algorithms for art image detection and artistic filters.
- Implemented image restoration techniques utilizing the heat equation.
- Successfully revealed invisible parts in medical images by manipulating specific numerical data sets.

Large-scale Residential and Commercial HVAC Design

For: Construction Engineering System Organization

- Designed and delivered comprehensive HVAC systems for large-scale residential and commercial projects.
- Ensured strict compliance with international codes and standards, including SOLAS and NFPA.
- Optimized HVAC systems for maximum safety, energy efficiency, and cost-effectiveness.

Language

English ●●●●●

Work Experience

Research Engineer

Barcelona Supercomputing Center (BSC)
Barcelona, Catalonia, Spain
March 2024 - October 2024

Tasks and Achievements

- Engaged in advanced research on fluid mechanics and computational modeling.
- Focused on the development and optimization of finite element methods (FEM) for large-scale simulations on high-performance computing (HPC) systems.
- Collaborated effectively within a multicultural, cross-functional environment to achieve project goals.

Research Intern

Physics Institute of Rennes
Rennes, Brittany, France
February 2017 - July 2017

Tasks and Achievements

- Conducted advanced research on heat and mass transfer within porous media.
- Focused on successfully coupling experimental data with advanced numerical models.

Senior Mechanical Engineer

Construction Engineering System Organization of Alborz Province
Karaj, Alborz, Iran
February 2015 - Present

Tasks and Achievements

- Delivered HVAC designs for large-scale residential and commercial projects.
- Ensured strict compliance with international codes and standards, including SOLAS and NFPA.
- Conducted thorough reviews of HVAC design documents, successfully optimizing systems for safety, efficiency, and cost-effectiveness.

Mechanical Engineer

Omran Energy Company
Tehran, Iran
June 2012 - January 2015

Tasks and Achievements

- Led HVAC system design and installation for offshore and onshore oil and gas facilities.
- Conducted risk assessments and provided effective solutions for scope changes in HVAC engineering.
- Collaborated with multidisciplinary teams to ensure project timelines and quality standards were consistently met.

Teaching

University Lecturer (Mechanical & HVAC Engineering)

Univ. of Applied Science and Technology / Shahid Beheshti Univ. / Azad Univ.
Taught specialized courses in mechanical engineering, developed academic curricula, and bridged the gap between theoretical physics and industrial applications.

Soft Skills

• Interdisciplinary Collaboration • Complex Problem Solving • Adaptability in Multicultural Environments