

ALI BAHARI (EIT in progress)

Vancouver, BC, Canada

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Highlights

Mechanical Engineering graduate with robust project management and technical design expertise. Proven in transforming design concepts into production-ready prototypes while ensuring strict compliance with ISO controls. Adept at collecting design inputs, building proof-of-concept models, and guiding projects through rigorous risk management and documentation—skills that support transitions from design to manufacturing in regulated environments.

Experience

Hill Lab, University of British Columbia

Jul. 2022 – Jan. 2025

Graduate Research Assistant

Vancouver, BC

- Collected and clarified design input requirements for the development of a reusable breath sampler, ensuring alignment with ISO 13485 design controls.
- Managed the transformation of conceptual designs into working prototypes using SolidWorks and rapid prototyping (filament & resin 3D prints), while overseeing risk management and technical documentation.
- Coordinated the design of a miniaturized PCB integrating CO₂ and pressure sensors plus a BLE module, ensuring smooth transition to manufacturing and supporting verification testing.
- Engineered a miniature magnetic valving mechanism with validated CFD performance (error <2%), with invention disclosure filed and under PCT investigation.
- Developed a breath cartridge system and extraction tool, managing iterative prototyping and manufacturing process improvements to support regulatory compliance.
- Produced comprehensive engineering design documentation including drawings, work instructions, and test reports, facilitating successful production release and cross-functional training.

Saramad Laboratory Equipment Manufacturing

Jun. 2019 – May 2022

Junior Mechanical Engineer

Tehran, Iran

- Led the design and development of an enclosure for a PCR thermal cycler using SolidWorks; gathered design inputs and iterated prototypes via resin & filament 3D printing with user feedback.
- Implemented a PID-controlled thermal cycler system, producing detailed engineering documentation and test reports to verify performance.
- Developed a custom PCB integrating Peltier thermoelectric modules and RTD sensors, ensuring compliance with industry standards and supporting risk management practices.

Micro-Nano System Laboratory (MNSL), Sharif University of Technology

Jun. 2019 – Dec. 2020

Undergraduate Research Assistant

Tehran, Iran

- Contributed to the design and development of a digital microfluidic point-of-care coagulometer by compiling design requirements and supporting risk analysis documentation.
- Fabricated a cost-effective 3D H-filter via Xurography, incorporating iterative design improvements based on technical reviews.
- Investigated electrowetting-based devices and developed a transparent electrowetting-on-dielectric system with permanent liquid electrodes, documenting test protocols and performance data.

Education

University of British Columbia

2022 – 2025

Master of Applied Science in Biomedical Engineering

Vancouver, BC, Canada

- GPA: 4.0/4.0 (or 91/100)
- Thesis: Design, development, and testing of the BreathPod—a portable, modular breath sampling device for VOC analysis. Integrated a miniaturized PCB with sensors, a magnetic valving mechanism, a CFD-optimized baffle system, and a cartridge system compatible with industry-standard thermal desorption tubes.
- Supervisor: Dr. Jane Hill.

Sharif University of Technology

2016 – 2021

Bachelor of Science in Mechanical Engineering

Tehran, Iran

- GPA: 3.88/4.0 (or 86/100)
- Thesis: Design and development of a digital microfluidic point-of-care coagulometer.
- Supervisor: Dr. Mojtaba Taghipoor.

Technical Skills

Software: SOLIDWORKS, CATIA, Autodesk Fusion 360, ANSYS Fluent, COMSOL, AutoCAD, CorelDraw, Adobe Photoshop, Roland CutStudio, KeyShot, ImageJ, Adobe Premiere Pro CC, Microsoft Office (Word, Excel, Outlook, Project)

Programming: MATLAB, Python, Arduino, C, C++, OpenCV, HTML, CSS, L^AT_EX

Projects

ISO Standards Review for a Coagulometer — Clinical and Industrial Biomedical Engineering **Winter 2023**

- Developed comprehensive review documents covering product concept, architectural design, requirement specifications, and risk management in strict adherence with ISO 13485.
- Synthesized multidisciplinary engineering principles and regulatory guidelines to optimize device design and streamline technical submissions.
- Collaborated in a team-based project (2023W1 term) to integrate risk mitigation strategies and maintain rigorous design controls.

Transparent EWOD with Liquid Electrodes — Fundamental of MEMS **Winter 2022**

- Authored a research paper investigating liquid electrodes in EWOD systems, emphasizing hands-on proof-of-concept and technical review.
- Analyzed droplet actuation forces and dynamics to compare liquid and conventional solid electrodes.
- Demonstrated enhanced optical transparency and mechanical stability, indicating potential for flexible and wearable microfluidic devices.

MHD Microfluidic Pump — Lab-On-a-Chip **Spring 2019**

- Developed a magneto-hydrodynamic microfluidic pump, managing design iterations from concept to functional prototype and documenting key design inputs.

Molecular Dynamics of Protein Fragments — Micro-Nano Technology **Fall 2019**

- Conducted molecular dynamics studies to elucidate protein fragment behavior, emphasizing analytical methods and process documentation.

Blood Glucometer — Measurement and Control Systems **Fall 2019**

- Developed a point-of-care blood sugar testing device, integrating sensor and UI design while generating detailed engineering documentation.

Fog Harvesting Optimization — Interfacial Fluid Mechanics **Fall 2018**

- Optimized fog harvesting through experimental studies on mesh geometry, significantly enhancing water collection efficiency and recording process improvements.

Automatizing Gearbox Design — Machine Element Design II **Spring 2019**

- Automated gearbox design using Python, streamlining design workflows and enhancing computational efficiency while documenting design iterations.

Publications

I. J. E. Hill, M. Mwanza, **A. Bahari**, *Breath Sampling Apparatus* ([PCT Published – US and EU Patents, Under investigation](#))

II. **A. Bahari**, A. Mirzaei, M. Taghipoor, *Cost-effective 3D H-filter fabricated by Xurographic method, Microfluidics and Nanofluidics*, 2022. [\[Link\]](#)

III. **A. Bahari**, M. Abdar Esfahani, M. Taghipoor, *Transparent electrowetting-on-dielectric device with permanent liquid electrodes, Microfluidics and Nanofluidics*, 2023. [\[Link\]](#)

Extracurricular

- Provided over 500 hours of tutoring in Mathematics and Science to high school students in Canada, enhancing their academic performance.
- Served as Secretary for MEHVAR, the Scientific Association of the Mechanical Department at Sharif University of Technology.
- Conducted over 100 hours of Adobe Premiere Pro instruction as a video editing instructor.
- Led the Advertisement Team in organizing major events such as Researcher Day 2019 and YALDA 2018 at Sharif University of Technology.