Nazim Belabbaci

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Summary

I am a Research Engineer/Scientist focused on applying AI and biosensing for health monitoring and disease diagnosis. Experienced in generative modeling, multimodal physiological data, and multi-omics analysis. Proven track record in developing end-to-end systems, from sensor/embedded design to signal processing, model development, and deployment. Comfortable leading a team as serving as a team member.

Education

PhD, Computer Science, University of Massachusetts Lowell, Lowell, MA | 2026 (Expected)
Master, Computer Science, University of Massachusetts Lowell, Lowell, MA | 2023
Master, Computer Engineering, National Institute of E&E Engineering, Boumerdès, DZ | 2019
Bachelor, Electrical & Electronic Engineering, National Institute of E&E Engineering, Boumerdès, DZ | 2017

Research & Academic Experience

Graduate Research Assistant, *University of Massachusetts Lowell*, Lowell, MA | 2022–Present
◊ Built an optical sensing wearable for hydration monitoring with on-device inference. Demonstrated feasibility and secured IRB approval to validate the prototype against ground-truth (saliva-osmolarity).
◊ Developed a diffusion model to generate synthetic spectroscopy signals. This data augmentation boosted cancer detection accuracy by 4% and specifically by 12% while maintaining sensitivity.
◊ Built attention-based models for fatigue, emotion, and activity recognition from a public multimodal wearable dataset (HR, respiration, EDA, temperature, accelerometer), achieving stable cross-task performance and up to +15 pp accuracy gains over published baselines.

PhD Research Intern, *Beth Israel Deaconess Medical Center (BIDMC)*, Boston, MA | 2025–Present
◊ Built a reproducible computational pipeline on an HPC to process 5 large RNA-seq datasets for viral splicing analysis. Complemented this with Python scripts to automate statistical filtering and downstream functional analysis, effectively identifying key isoform switching events.
◊ Extracted COVID symptoms from unstructured clinical notes using zero-shot classification (BART), then linked symptoms to transcriptomic pathway activity scores to quantify symptom–pathway relationships in COVID. Contributed to a paper published in *Nature Immunology*.

Graduate Teaching Assistant, *University of Massachusetts Lowell*, Lowell, MA | 2023–Present
◊ Teaching Artificial Intelligence and Assembly Language; led weekly labs/recitations for 100+ students.

Graduate Research Assistant, *University of North Dakota,* Grand Forks, ND | 2021–2022
◊ Developed interpretable ML models to detect cancer signatures from cfDNA and ATAC-seq data, identifying key regulatory chromatin features; published in *Nature Communications Biology.*
◊ Co-developed MotifXplorer, a web-based platform for visualizing model predictions and interpretability outputs, enabling researchers to link transcription-factor binding motifs to disease outcomes.

Industry Experience

Co-Founder & Embedded Systems Engineer, *Deadline Technologies*, Bouira, DZ | 2020–2021
◊ Designed Wi-Fi/BLE-enabled development boards for sensor data acquisition and telemetry.
◊ Managed full product lifecycle: from PCB design and firmware development to manufacturing and sales.

Embedded Software Engineer, *EURL Microtechnologies Lab*, Boumerdès, DZ | 2019–2020
◊ Developed firmware and software for laboratory-grade electrical measurement instruments used in national educational institutions. Contributed to project planning, debugging & testing.
◊ I helped define key design requirements and delivered products later adopted by local universities.

Awards & Honors

Finalist of the $200K Challenge**,** an annual start-up competition hosted by **M2D2 |** 2024**.**
Recipient, LaTorre Family Scholarship Endowment Fund (UML), 2023.

Winner of the UND Big Idea Challenge | 2022
◊ Pitched a deep learning approach for early COVID-19 detection using wearable device data.
◊ Wrote a 30-page business plan and presented it to a panel of business and industry experts.
◊ Gained valuable experience in business planning, market analysis, and financial modeling.

Winner of Leapfrog International Hackathon of Algiers | 2018
Project: eHealth, An IoT Medical Monitoring Device.
◊ Led a 48-hour team sprint that delivered a multi-sensor health monitoring prototype and real-time dashboard. Programmed a micro-controller to interface with custom circuitry as long as a mobile app.
◊ Demonstrated the system to a panel of industry experts.

Civic Engagement

Chair, Student Initiative*, AAASTE*, Pembroke Pines, FL | 2022-2024
◊ Led a team of students to plan and to deliver online STEM webinars to 200+ students.
President & Head Project Manager, *Wameedh Scientific Club*, Boumerdès, DZ | 2016-2019
◊ Managed Club structure, events & activities; Secured funding and delivered workshops (100+ students).