

Bilal Shihab

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EDUCATION

UNIVERSITY OF TEXAS AUSTIN

Bachelor of Science, Biomedical Engineering

Austin, TX

May 2027

- **Organizations:** Biomedical Engineering Society, Texas Guadalupe, Texas Engineering World Health
- **Relevant Coursework:** Intro to Computational Engineering Design, Intro to Computing, Introduction to Python & C++, Statistics, Circuits, Biomechanics, Numerical Methods, Differential Equations & Linear Algebra

SKILLS AND INTERESTS

- **Technology/Skills:** Python, C++, MatLab, R, Jupyter, Google Cloud, Pandas, Matplotlib, Android Studio/IntelliJ, Pytorch, Keras, Machine Learning, SolidWorks, Fusion 360, Captum, Optuna
- **Languages:** Arabic (Native), French (Beginner)

EXPERIENCE

FUNCTIONAL OPTICAL IMAGING LABORATORY

Austin, TX

Researcher and Programmer

Sep 2023 - Present

- Developed a comprehensive Laser Speckle Analysis UI using Python and PySide6, integrating real-time image capture and analysis with Basler cameras and Arduino control for auto laser intensity adjustment.
- Enhancing precision in speckle pattern evaluation and optimizing laser current recommendations through advanced histogram, pixel count, and contrast analysis methods.
- Optimized contrast adjustment script, rewriting it from MATLAB to Python, enhancing the system's efficiency.

LONGHORN NEUROTECH

Austin, TX

AI/ML Developer

Sep 2024 - Present

- Collaborated on developing machine learning models for Brain-Computer Interfaces (BCI) aimed at controlling a prosthetic arm, leveraging advanced techniques such as Convolutional Neural Networks, Capsule Networks, & Radial Basis Function Networks.
- Explored and implemented various interpretability techniques, including Optuna for hyperparameter optimization, to improve model transparency and provide insights into model decision-making processes, enhancing the reliability of BCI applications.

MATH INSTRUCTOR

Mountain View, CA

Mathnasium

Apr 2022 - Jun 2023

- Mentored grade school students in mathematics, developing personalized curriculum and innovative teaching techniques tailored to each student's learning style and pace, fostering a deeper understanding and appreciation of mathematical concepts.
- Facilitated conflict resolution among students and employees, employing effective communication strategies to promote a collaborative learning and working environment.

BIOMEDICAL ENGINEERING SOCIETY

Austin, TX

Competition Director

Aug 2023 - Present

- Spearheaded the entire competition process, ensuring alignment with strategic objectives and seamless execution, while also developing the competition prompt.
- Managed logistics and facilitated effective communication with participants, ensuring all aspects of the event ran smoothly.
- Designated tasks to team members and optimized resource allocation, contributing to the successful outcome of the event

PROJECTS

MOTORMIND PROJECT

Austin, TX

- Developing a framework for converting brain signals into speech using EEG data and Google's Gemini AI.
- Implemented advanced tokenization methods to process and interpret EEG signals for accurate speech generation and integrated Supabase for efficient storage and management of EEG token embeddings.
- Planned the next phase of the project to design a specialized headset for real-time brain-to-speech conversion, enhancing accessibility and communication.

HEALTHCARE AI PROJECT

Austin, TX

- Creating a system for uploading and managing DICOM files using Google Cloud Healthcare API.
- Implemented a Pub/Sub notification system to monitor DICOM uploads, enabling real-time data processing.
- Configured Google Cloud resources, including DICOM stores and Pub/Sub topics, to support healthcare data workflows.
- Planned integration of AI-powered analysis for DICOM images to enhance diagnostic capabilities.

COLLEGE AI PROJECT

Austin, TX

- Developing an AI chatbot using Langchain and Google Cloud to assist students with college selection, enhancing user experience through personalized recommendations.
- Managed a comprehensive database of colleges and majors on Google Cloud for efficient data retrieval.
- Implemented AI features through Vertex AI, integrating natural language processing and retrieval-augmented generation (RAG) to enhance chatbot functionality.
- Strengthened expertise in cloud infrastructure, database management, and algorithm design through hands-on project development.