

Akshit Monga

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Education

B.S. in Biomedical Engineering

San Jose State University, San Jose CA

August 2021 - May 2025

Professional Experience

Research and Development Intern

Jabil Circuit, Inc.

August 2024 - June 2025

- Completed formal lab training in common instrumentation and analytical techniques, and gained experience with experimental design and SOPs, equipment handling, and data management in an R&D environment.
- Worked in a 4 member interdisciplinary team to complete the development of a machine learning-based AI assistant to automate information retrieval for manufacturability (DfM), accelerating design information retrieval by 87%.
- Engineered a complete RAG (Retrieval-Augmented Generation) pipeline using OpenAI's gpt-4o-mini, integrated with LangChain and ChromaDB for intelligent document retrieval from internal documentation.
- Integrated the RAG model into Jabil's design ecosystem via cloud deployment on the DFX website.
- Collaborated cross-functionally with manufacturing engineers and regulatory teams, validating chatbot function.

Projects

Surface EMG-Controlled Prosthetic Hand

BioMEMS

December 2025 - Present

- Designed a 3-phase development pipeline for a myoelectric prosthetic hand, using surface EMG sensors and Raspberry Pi
- Developed Python-based control algorithms with signal filtering (moving average, hysteresis) to convert EMG signals into servo motor actuation with >85% response accuracy
- Designed and 3D printed finger and hand components in PLA, PETG, TPU; integrated tendon routing and servo-based actuation for individual finger and wrist movement
- Built scalable DOF control logic to support full-hand coordination; implemented modular control framework for both EMG and potentiometer-assisted inputs
- Conducted iterative testing, refining mechanical tolerances, control thresholds, and system responsiveness over 10+ iterations

Microneedle Insulin Delivery Model

COMSOL Fluids Project

February 2024 - May 2024

- Engineered a 2D COMSOL simulation for microneedle-based insulin delivery, capturing circadian drug kinetics and optimizing needle geometry
- Designed 3 prototype arrays using boundary layer modeling and dermal and transdermal constraints; visualized >92% insulin uptake efficiency via heat maps
- 3D-printed a 256-needle array with biocompatible resins; validated dose uniformity with agarose diffusion analogs
- Modeled diffusion coefficients across varied epidermal thicknesses; simulated PK response profiles and stress-strain behavior of microneedle insertion

Coronary Stent Design and Analysis

Solidworks Project

February 2024 - May 2024

- Developed and evaluated three stent geometries (diamond mesh, auxetic, twisted-link) using SolidWorks and ANSYS.
- Simulated angioplasty loading conditions and vessel compliance via non-linear FEA; reduced peak stress regions by >20%
- Compared materials nitinol, Ti-6Al-4V for fatigue life and radial strength; validated designs with >2.0 safety factor
- Created crimp-expansion models with balloon catheter systems; achieved <5% elastic recoil post-deployment.
- Fabricated MVP using resin stereolithography and mechanically tested in Instron

SKILLS

- Lab & Research Techniques:** ELISA • HPLC • MALS • LC-MS • PCR • Gel Electrophoresis • DLS • SEM • FTIR • Biocompatibility Testing • Experimental Design • Statistical Analysis (ANOVA, Regression)
- Technical Tools:** SolidWorks • COMSOL Multiphysics • MATLAB • ImageJ/FIJI FEA
- Programming & Data Analysis:** Python Scripting (Bash, NumPy, scikit-learn, spaCy) • R • Java • TensorFlow (basic) • PowerShell Data • Visualization • AWS Lambda • Microsoft Azure
- Languages:** English (*Native*), Hindi (*Proficient*), Japanese (*Limited Proficiency*)

PASSIONS

- Artificial Intelligence; Computer Science; Brain-Computer Interfaces; Cardiological Devices; Neuroengineering; IPSCs; Cancer RnD; Tissue Engineering