BHARATH CHANDRA VADDARAM

Biomedical engineering student with a strong background in Electronics and Therapeutics

(602) 756-2288 • bharath.vbcr@gmail.com • https://www.linkedin.com/in/bharath-vbcr • https://bharathvbcr.github.io/bharath.github.io/

EDUCATION

Master of Science in Biomedical Engineering **December 2024**
Arizona State University (ASU), Tempe, AZ *GPA: 4.0/4.0*
Coursework: Bio-sensing Technologies, Principles of Immunoengineering, Biomedical Microdevices

Bachelor of Technology in Electronics and Communication Engineering - Biomedical Engineering **May 2022**
SRM Institute of Science and Technology (SRM IST), Chennai, India *GPA: 3.42/4.0*

TECHNICAL SKILLS

Technical Skills: Electronics, Cell Culture, Wet Lab, Preventive Maintenance, Product Development, Microfluidics, Biomaterials, Bioimaging, Toxicology

Testing & Research: Data Analysis, RF Testing, Calibration, Performance Testing, Cancer Research, Microbiology, Characterization Techniques

Simulation Software & Tools: Ansys, AutoCAD, MATLAB, OriginPro, PyTorch, SolidWorks, Xilinx, ImageJ, MySQL

Programming Languages: C, Java, Python, SQL

PROFESSIONAL EXPERIENCE

Associate Researcher, Adidas - Center for Engagement Science, ASU, Tempe, AZ **August 2023 – Present**
- Analyze behavior across physical, emotional, and cognitive domains using multi-faceted biometric data.
- Pioneer research initiatives harnessing sensor-derived data and human perception to drive product development and innovation.

Intern, SVIMS Hospital, Tirupati, India **June 2022 – September 2022**
- Minimized downtime and maximized equipment lifespan through proactive maintenance, including thorough diagnostics, effective repairs, and meticulous service record management.
- Provided support and training to healthcare staff on equipment utilization, patient care, issue resolution, and reporting of problems.
- Installed new equipment and performed steering setup, calibration, and performance testing procedures.

Research Assistant, ANTs Research Group, SRM IST, Chennai, India **June 2021 – May 2022**
- Led cross-functional team of 4 in researching utilizing iron-based nanoparticles to generate localized heat for cancer hyperthermia treatment applications.
- Presented research on the ”Feasibility of radiofrequency hyperthermia using iron oxide hydrogel for prostate cancer treatment” at the Dr. Paarivendhar Research Colloquium, SRM Institute of Science and Technology.
- Collaborated on a project ”Designing microfluidic chips to isolate circulating tumor cells” while contributing expertise to the progress of innovative technologies in cancer research.
- Created and characterized tissue-mimicking phantom suitable for in-vivo studies by demonstrating proficiency in experimental design and execution.
- Re-engineered bright-field microscope into fluorescence microscope to enhance bio-imaging purposes capabilities.

ACADEMIC PROJECTS

Neural Spike Sorting and Analysis using Principal Component Analysis **January 2024 – February 2024**
- Developed a data-driven thresholding method for identifying action potentials.
- Implemented PCA-based clustering to differentiate action potential waveforms from noise.
- Visualized results through comprehensive plots of individual spikes, mean waveforms, and PCA projections.

Research Proposal - 3D-Printed Gold Nanoparticle for Localized Surface Plasmon Resonance **October 2023 – December 2023**
- Develop 3D-printed gold nanoparticle biosensors using surface plasmon resonance for affordable point-of-care diagnostics.
- Optimize 3D printing and surface functionalization for selective biomolecule detection.

Research Proposal - Wearable for Accurate stress detection **November 2023 – December 2023**
- Develop wearable sensors to measure cortisol, heart rate variability, and skin temperature for continuous stress monitoring.
- Build machine learning models to classify personalized stress levels from sensor data features.
- Design intuitive visualizations and UX to display stress insights for optimized user adoption.

Classification of chest diseases using NIH chest X-ray dataset **February 2023 – April 2023**
- Leveraged a Swin Transformer model to accurately identify 14 distinct chest diseases from the NIH-Chest Dataset.
- Utilized pre-trained ImageNet models, achieving a promising AUC score of 0.78 for robust disease classification.

Development of Iron-Based Nanoparticles for Hyperthermia **January 2022 – April 2022**

- Synthesized iron oxide nanoparticles (IONP) with yield size of 11nm through co-precipitation method, showcasing nanomaterial synthesis proficiency.
- Pioneered a novel approach to achieve homogeneous heating and enhanced biocompatibility by developing IONP conjugated with HA gel, resulting in a 13nm particle size.
- Performed experiments demonstrating magnetic hyperthermia potential of HA-IONPs, reaching 48°C under RF exposure and inducing 26% greater cytotoxicity versus controls.
- Conducted testing of HA-IONPs in a tissue-mimicking phantom by evaluating the efficacy of hyperthermia applications through practical contributions to medical research.

Conversion of Compound Microscope into Fluorescence Microscope for Bioimaging **July 2022 – December 2021**

- Engineered cost-effective microscopy system achieving high-end image quality at 10% of the cost, unveiling potential for affordable advanced imaging solutions.
- Spearheaded validation of cost-effective microscopy system by imaging DAPI-stained endothelial cells under UV light and benchmarking against high-end microscope results..
- Improved diagnostic capabilities of the microscope by enabling swift image acquisition/streamlined analysis processes.

Finite Element Analysis of Femur Bone **March – May 2023**

- Created a three-dimensional model of the femur bone from DICOM files obtained from a CT scan.
- Imported the model into ANSYS, a finite element code, to perform stress analysis.
- Analyzed the results of the stress analysis to identify areas of high-stress concentration.

PUBLICATIONS

FEASIBILITY STUDY OF A THERANOSTIC SPION's - HA GEL FOR KNEE OA PAIN MANAGEMENT

- Selected for publishing a full-length research paper in **Springer Nature** conference proceedings demonstrating the theranostic potential of HA-IONPs to serve as an imaging agent and pain relief method for knee osteoarthritis. The paper was selected for the **ICNOC-2022** conference proceedings.

PRESENTATIONS

- Presented a poster on "Feasibility study of a Theranostic SPIONs- HA Gel for Knee OA pain management" at "International Conference on Nanotechnology (ICNOC): opportunities and challenges," November'22.
- Presented a poster on "Feasibility of RF Hyperthermia using SPIONS Impregnated Hydrogel for Prostate Cancer" at "Dr. Paarivendhar Research Colloquium (DPRC)," SRMIST, March'22.