

SAURABH VIKAS RAUT
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CONTACT

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SUMMARY

- Bioengineer with experience in research and development
- Proficient in MATLAB image processing and biosignal processing
- Highly motivated, collaborative team player with sound written and verbal communication skills

EDUCATION

The University of Texas at Dallas

May 2020

Master of Science in Bioengineering and Biomedical Engineering(THESIS)

GPA: 3.9/4.0

M.S. Ramaiah Institute of Technology, Bangalore, India

June 2017

Bachelor of Engineering in Medical Electronics

GPA: 8.91/10

Languages

English Kannada Marathi Hindi

TECHNICAL SKILLS:

Programming Languages: Embedded C, C++, MATLAB, Java, Python

Data Acquisition & Analysis tools: MATLAB, LabView, Arduino IDEs, MSP430 (Energia IDE)

Design/Simulation tools: LTSPice, NI-myRIO, MATLAB Simulink

CAD tools: SolidWorks

Regulatory: cGMP, FDA, 21 CFR 820, ISO 13485, ISO 14971, ISO 9001, GCPs, GLPs, cGMPs

Quality: FMEA, Hazards Analysis (HA), CAPA, documenting SOPs & ECOs, DMAIC (Six sigma)

Microsoft office: Excel, PowerPoint, Word, Outlook

EXPERIENCE

Biomedical Engineer Co-Op - Battelle, Columbus OH

January, 2020-May 2020

- Assist Sr. Research scientist in running experiments in a regulated setting in compliance with QMS
- Data acquisition, processing, analysis and device calibration during clinical trial/Human Subject study for NeuroLife™ Functional Electrode Stimulation (FES) Sleeve
- Conducting the sessions for spinal cord injury (SCI) subject and testing portable FES system for user feedback
- Signal processing, data visualization for multiple projects in feasibility stage of product development life cycle
- Assisted in regulatory filing for pre-clinical studies, developed ECOs, FMEA, CAPA reports for NeuroLife™ products
- Assisted in IRB documents, Hazard analysis (HA), SOP development for clinical trial/Human Subject study for NeuroLife™ Functional Electrode Stimulation (FES) Sleeve
- Assisted in inventory monitoring, procurement of lab supplies, equipment maintenance and troubleshooting

Graduate Research Assistant- University of Texas at Dallas, TX, USA

August 2017-May 2020

- Thesis project on ‘Non-invasive pressure estimation of tumor cell’, using focused ultrasound and phase change contrast agent (PCCA), to improve the efficiency of targeted drug delivery
- Developed system and method for noninvasive pressure estimation using ultrasound and phase change agents

- Evaluated impact of physical conditions on activation threshold of PCCA using pulsed ultrasound

Graduate Teaching Assistant (3 courses) - University of Texas at Dallas, TX, USA

August 2018-December 2019

- Assisted the faculty for Biomedical Feedback systems, Biomedical Lab components and Introduction to bioengineering- Circuits course with research, course structure, grading of assignments and exams, laboratory providing extensive training for microcontroller programming skills
- Mentored students to setup and implement different PID controllers for artificial pancreas, DC Motor, heating, microcontroller sensing device
- Assisted students in developing strategies and implementing modeling and simulation using MATLAB and LabVIEW

Laboratory Manager- University of Texas at Dallas, TX, USA

August 2018-January 2019

- Managed and maintained entire supplies, equipment and information technology inventory of the Biomedical teaching laboratories
- Assisted faculty and Teaching Assistants in setup, ordering supplies and scheduling of classes along with technical support

R&D Engineering Internship- Indira Gandhi Centre for Atomic Research, Kalpakkam, Tamil Nadu, India

August 2016-March 2017

- Assisted Quality Assurance Division for project on early diagnosis of breast cancer using thermal imaging
- Assisted QAD for clinical data acquisition during cancer awareness camp in accordance with the organization's QMS policies
- Accelerated the software tool development, for image processing and analysis, progress by 2 months

Biomedical Engineer Internship - M.S. Ramaiah Memorial Hospital, Bangalore, Karnataka, India

June 2016 – July 2016

- Assisted Biomedical Engineer and technician, monitored periodically the efficient working of equipment, and documenting records of the inventory for the same in multiple departments- Non-invasive Testing Lab, Critical Care unit, Rehabilitation center, Biomedical Department
- Improved response time by 50% and troubleshoot time by 20%

PROJECTS

Portable FES system for Upper Limb Reanimation (Jan 2020- May 2020)

- Piloted an easily operated, wheelchair mounted FES system that provided hand function reanimation to tetraplegic subjects for performing functional grasps associated with activities of daily living at home
- Technical set-up and device calibration, along with conducting sessions for system optimization and user experience improvement
- Analyzed FES data and generated 2D & 3D visualizations of stimulation patterns for optimizing system towards automated calibration

Non-invasive pressure estimation of tumor using Ultrasound imaging and phase change contrast agent (PCCA) (2017-2020):

- Developed system and method for invitro pressure estimation using US and PCCA in accordance to GLP
- Analyzed and formulated interdependence of pressure, temperature, and frequency of transducer on vaporization threshold of PCCA
- Simulated PCCA behavior to estimate the dependence of various parameters on pressure threshold upon application of acoustic energy

SBIR grant proposal- Glaucoma Management Contact Lens

Aug 2018 – Dec 2018

- Implemented novel electro-mechanical feedback-based system for intraocular sensing and drug delivery through contact lens for alleviating glaucoma
- Developed a model and simulated real-time results (MATLAB and LabVIEW) based on the device design and specifications
- Proposed a mock grant including research strategy

Global Regulatory Strategy for introduction of novel Naso-gastric tube (Blowfish™ NGT, Baylor Scott & White)- 2018:

- Developed global regulatory strategy to introduce a patented product into the global market •Identified and implemented a regulatory pathway for FDA, Health Canada, European Union, ANVISA (Brazil), PMDA (Japan)
- Analyzed the current market trend and formulated an efficient plan for approval of the device in the global market
- Analyzed and interpreted requirements from diverse regulatory environments throughout the product development life-cycle according to standards such as ISO 13485 Medical Devices – Quality Management System, ISO 9001 – Quality Management Systems, and ISO 14971 Medical Devices – Risk Management

Novel standard care approach for Anaplastic Thyroid Cancer

Jan 2018 – Apr 2018

- Developed a feedback based targeted drug delivery treatment regimen for anaplastic thyroid cancer
- Implemented biomaterial structures (iodoliposomes) for chemotherapeutic agent loading and controlled release to reduce toxic effects and efficient shrinking of the tumor
- Improved targeted delivery by rationalizing the use of focused ultrasound and monitoring the progress of tumor dynamics using X-ray fluorescence for safe surgical resection of the tumor

Product Teardown- MicroLife:PF 100 Asthma Monitor

Jan 2018 – Apr 2018

- Evaluated competitive benchmarking of the product and performed delineated component breakdown
- Estimated working and principle of the device using a functional model
- Acquired and analyzed data for asthma and healthy subjects for sensitivity and performance tests
- Developed the extrapolation model using a nanoscale approach for the same product functioning
- Rationalized the use nano-vent skin replacing the turbine to improve sensor gain, signal capture and achieve self-sustained system eliminating the need for a battery

Study and development of Computer Aided Diagnostic tool for breast thermogram- 2017:

- Developed a MATLAB based GUI software for visualization, and image processing
- Implemented deep learning for high efficiency classification of cancerous and non-cancerous breast thermal images
- Improved classification sensitivity, accuracy, and runtime performance

Classification of sex based on speech differentiation in healthy human beings based on voiced and unvoiced components

Aug 2016 – Jan 2017

Comparing the statistical parameters between male and female speech signals using MATLAB for acquisition and processing.

Acquisition of Pulse Rate- 2016: Designed and implemented Photoplethysmography sensor; interfaced using NI-myRIO and LabVIEW software to monitor the pulse rate.

- Designed Photoplethysmography sensor
- Implemented real-time pulse wave and heart rate display for monitoring purpose

- Utilized NI-myRIO embedded device and LabVIEW programming to interface acquisition and signal processing circuits

ACADEMIC ACHIEVEMENTS

- Received Best project at “Pradarshana-2017”, M S Ramaiah Institute of Technology, Bangalore, for project titled, “Study and development of Computer Aided Diagnostic tool for breast thermogram”

CONFERENCES

1. Saurabh Raut et al., *System and method for noninvasive pressure estimation using ultrasound and phase change agents*, IEEE International Symposium on Biomedical Imaging, Venice, Italy, April 8-11, 2019
2. Saurabh Raut et al., *Classification of sex based speech differentiation in healthy human beings based on voiced and unvoiced components* International Conference on recent trends in Mechatronics, Electronics & Cloud Computing (ICRMEC- December, 2016), Bangalore, Karnataka

PUBLICATIONS

1. Master of Science Thesis: “Non-invasive pressure estimation using ultrasound imaging and phase change contrast agents”, Department of Bioengineering, The University of Texas at Dallas
2. “Impact of hydrostatic pressure on phase-change contrast agent activation by pulsed ultrasound” The Journal of the Acoustical Society of America 145, 3457 (2019); DOI: 10.1121/1.5111345
3. "Toward noninvasive pressure estimation using ultrasound and phase-change contrast agents," 2019 IEEE International Ultrasonics Symposium (IUS), Glasgow, United Kingdom, 2019, pp. 139-142.
4. “Classification of sex based speech differentiation in healthy human beings based on voiced and unvoiced components” Indian Journal of Science and Technology, DOI: 10.17485/ijst/2017/v10i1/109386

CERTIFICATIONS

Android Studio-App development Manipal-ProLearn

VOLUNTEERING/ACTIVITIES

- Enactus, USA (UT Dallas Chapter), August, 2017- May, 2018: Project Co-ordinator and Communications Officer – Built & maintained relationship amongst project team and corporate organizations and work towards achieving corporate social responsibilities, compiled project reports and monitored progress
- Former member of IEEE EMBS Bangalore Chapter- Organized and participated in technical workshops, conferences and competitions