

ANUJ AGARWAL

4119 Katherine Place, Lexington, KY 40515

Cell: (859) 285-0069

an.agarwal84@gmail.com

OBJECTIVE

To work in a fast-paced, dynamic environment ripe with opportunities to apply and enhance my biomedical engineering skills and experience.

SUMMARY

- Biomedical engineer with 4+ years of experience in medical device product development (related to pulmonary disorders)
- Experience in working under an FDA Part 820 and ISO 13485 compliant quality management system
- Experience in design and development of prototypes/algorithms, conducting feasibility/ proof of concept studies, development of specifications / test methodologies, and technical writing (patents and grants)
- Experience with Design Verification and Validation, Risk Management, PFMEA, NCR's, CAPA's, and ECR's
- 7+ years of experience in developing algorithms and working with sensors such as piezoelectric and pressure sensors
- Proficient at programming in MATLAB and LabVIEW for applications related to data acquisition, signal and image processing, and mathematical modeling

SKILLS

Software: MATLAB, LabVIEW, C, Visual Basic, Microsoft Office, Python (entry-level)

Analytical skills:

- Signal and image processing
- Machine learning, Predictive modeling
- Cardiac optical fluorescence mapping with high-speed CCD cameras using potentiometric dyes

WORK EXPERIENCE

1) Liberate Medical LLC, Kentucky

Oct 2017 - Present

Director of Engineering Research

- Developed the electrical stimulation algorithm for **VentFree, a Respiratory Muscle Stimulator device**, designed to help patients wean from mechanical ventilation
- Developed a **novel version of VentFree for use during COVID-19**, that used a sensing modality external to the ventilator circuit, reducing the exposure of healthcare workers to the virus
- Involved in developing software for a **Cloud based data hub**, which will allow remote data collection from medical devices and storage to a Cloud based database

2) Signal Solutions LLC, Kentucky

Dec 2013 - Jun 2020

Sr. Biomedical Engineer

- Developed software for a high-throughput system for **automated non-invasive tracking and characterization of rodent sleep and behavior**
- Developed a **Behavior Disruption System**, capable of providing total and partial sleep deprivation in rodents, for use in Epilepsy related research
- Developed and tested a **Classification algorithm** to detect phases of sleep (REM, NREM) in mice using

piezo sensor data, which is on-track for commercialization and use in preclinical Sleep studies.

3) Cardiac Rhythm Laboratory

Aug 2006 – Dec 2012

Dept. of Biomedical Engineering, University of Kentucky

Research Assistant

- Conducted experiments and used mathematical modeling to investigate mechanisms that lead to a disturbance of the rhythmic electrical activity of the heart to degenerate into lethal ventricular arrhythmia that causes sudden cardiac death
- Used time and frequency domain analysis to study characteristics of a system used to predict electrical instability in the heart
- Used optical data captured with a CCD camera, to make isochronal and isopotential maps and movies to detect patterns in spread of electrical activation over the heart surface. Image analysis included masking, data extraction, and filtering

EDUCATION

Ph.D. Biomedical Engineering

GPA 3.66

University of Kentucky, Lexington, KY

Sept 2013

Ph.D. Thesis: *Effects of Acute Stretch on Cardiac Electrical Properties in Swine*

Bachelor of Biomedical Engineering,

GPA 3.8

S.G.S. Institute of Technology & Science, R.G.P.V. University, India

May 2006

SELECTED PUBLICATIONS

1. "Radiofrequency and Cryo-Ablation Effect on Transvenous Pacing and Defibrillatory Lead Integrity: An *In Vitro* Study," Yousef Darrat, **Anuj Agarwal**, Gustavo X. Morales, Joseph Thompson, Ahmed Abdel-Latif, Kelly Waespe, Luigi Di Biase, Andrea Natale, Abhijit Patwardhan, Claude-Samy Elayi. *Journal of Cardiovascular Electrophysiology*. Vol. 27 pp. 976-980, August 2016
2. "Lumbar Contribution to the Trunk Forward Bending and Backward Return; Age-related Differences," Milad Vazirian, Iman Shojaei, **Anuj Agarwal**, Babak Bazrgari. *Ergonomics*. Vol. 60, Issue 7, 967-976, 2016
3. "Hypertension-induced remodeling of cardiac excitation-contraction coupling in ventricular myocytes occurs prior to hypertrophy development," Ye Chen-Izu, Ling Chen, Tamás Bányász, Stacey L. McCulle, Byron Norton, Steven M. Scharf, **Anuj Agarwal**, Abhijit Patwardhan, Leighton T. Izu, and C. William Balke. *AJP- Heart and Circulatory Physiology* 293: H3301-H3310, 2007

PATENTS

1. Michael E. Lhamon, **Anuj Agarwal**, "Monitoring system using piezo-electric cable sensing", Patent # US 10,939,669. Filed May 2017, Issued March 2021
2. **Anuj Agarwal**, Michael E. Lhamon, "Monitoring using piezo-electric cable sensing", Patent # US 10,804,456. Filed April 2020, issued October 2020
3. **Anuj Agarwal**, Michael E. Lhamon, "Monitoring using piezo-electric cable sensing", Patent # US 10,615,332. Filed May 2017, issued April 2020
4. Michael E. Lhamon, **Anuj Agarwal**, "Monitoring using passive infra-red sensing", Patent # US 9,534,958. Filed October 2015, issued January 2017
5. **Anuj Agarwal**, Michael E. Lhamon, "Piezoelectric sensor assembly", Publication # US 2021/0066576
6. **Anuj Agarwal**, Michael E. Lhamon, Kevin Donohue, "Piezoelectric sensor assembly and Integrated base", Publication # US 2021/0059219

AWARDS

Max Steckler Fellowship, University of Kentucky

2009-2010

Graduate School Academic Year Fellowship, University of Kentucky

2006-2009

Research Assistantship, University of Kentucky

2009-2012