NAUBAHAR AGHA, PH.D.

Biomedical Device Engineer

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PROFESSIONAL SUMMARY

- Biomedical device development engineer with surgical implantation experience leading to successful design, software development and implementation of 3 custom, experimental Class 3 biomedical devices in 2 distinct animal models.
- Experience working under ISO 7864 and ISO 9626 and conducting Hazard Assessments and Design FMEA.
- Proficient in creating physical prototypes from technical sketches 3D CAD designs with 2 animal behavioral interaction products, and over 6 products designed and built with >9 peer-reviewed scientific publications.
- Flexible and open-minded individual, having worked in 4 research labs across 3 states in the US and in Germany with multi-cultural experience and deadline-driven project management contribution in a project funded by the EU for € 4.2 million.

EXPERIENCE

Senior Device Engineer

Genentech

April 2020 – Ongoing South San Francisco, CA

- Initiated, led and provided support to project teams developing cutting edge combination drug delivery devices in projects over half a million USD.
- Drafted, reviewed and approved ISO 13485 compliant DHF documents within a controlled environment, such as protocols, reports, design V&V, failure modes effects and analysis, and ISO 14971 compliant risk management plans.
- Successfully led multiple Design Reviews for novel medical devices, achieving project milestones and earning approval from subject matter experts as well as external reviewers.

Patent Examiner

United States Patent and Trademark Office (USPTO)

August 2019 – April 2020 San Jose, CA

- Review patent applications for biomedical devices to ensure conformity to formal requirements.
- Evaluation of special claim constructions, the requirement of restrictions, the recognition and development of probable interferences.

Device Development Engineer - Post Doctoral

German Primate Center (DPZ)

June 2017 – August 2019 Göttingen, Germany

- Reliably Led animal model behavioral and neuroscientific device testing on 3 non-human primate models within a single study
- Successfully performed survival surgical implantation of more than 6 neural probe devices.
- Collected and analyzed brain signal data from over 300 channels simultaneously, utilizing and testing a novel, wireless neural recording system.
- Developed, built, and tested a freely-moving, portable, wireless behavioral and neural recording environment for non-human primates

Engineering Consultant

Wyss Center for Bio and Neuroengineering

March 2016 – August 2016 Providence, RI

- Conducted tech transfer toward the application of a 510(k) of a Class 3 implantable biomedical device.

SKILLS

ISO 14971 | ISO 13485 | Six Sigma | Microsoldering | Wirebonding | CAD Design | Rapid Prototyping | dFMEA | Additive Manufacturing | MATLAB | Minitab | JMP | Autodesk Fusion 360 | Design Verification and Validation

CERTIFICATIONS

CAD and Digital Manufacturing, a 5-course specialization

Autodesk - Coursera

June 2019

Six Sigma Yellow Belt, a 4-course specialization

University System of Georgia - Coursera

June 2019

Engineering Design Process with Autodesk Fusion 360

Autodesk - Coursera

May 2019

EDUCATION

Ph.D. in Biomedical Engineering

Brown University

Sept 2009 – Nov 2015

B.S. in Bioengineering

University of California, Riverside

2005 – 2008

- Excellent teamwork and collaboration skills demonstrated by the transfer of technical data from a research lab in the US to a research company in Switzerland via lawyers, engineers and administrators.

EXPERIENCE CONT.

Research Engineer - Doctoral

Brown University

September 2009 – December 2015 Providence, RI

- Successfully led survival neural implantation surgeries on animal models: over 30 rodent, over 10 porcine, and over 6 non-human primate models
- Collaborated with neuro- and general surgeons to design, develop, and perform regulatory testing on a Class 3 biomedical device
- Resourceful innovator and regulatory awareness with expertise in implementing commercial standards into an implantable device resulting in meeting ISO 14708-3 standards while wireless charging, reducing the thermal footprint from over 10 °C to under the limit of 2 °C.

Doctoral Research Projects:

Integration of a Wireless Charging Standard in an Implantable Device

I designed an extremely small but powerful wireless charging printed circuit board (PCB) in order to integrate it into small, battery-powered implantable devices. The circuit board has the capability of receiving wireless power from a compatible coil and then charging an attached Lithium-Ion battery. This new circuit board, once integrated, allows the charging time of the implantable device to reduce from 4 hours down to under 30 minutes with a similar thermal footprint.

Transfer of Intellectual Property

I compiled all relevant work done in application specific Integrated circuit (ASIC) design including testing boards and all design files and transferred them to an outside company for managing the manufacture of the ASICs. I determined what was needed by the company to move forward and collected the required data including contacting previous students who had worked on the designs.

Non-human Primate Sleep Study

I attached a wireless neural data transmitter (Cereplex-W) to an external pedestal on a freely-moving non-human primate for the purpose of recording neural data during natural behavior. The animal was then allowed to sleep in its home cage and data during the onset, duration and end of sleep was recorded from the motor cortex and analyzed.

Freely-Moving Behavioral Swine Study

I took part in multiple surgeries to implant small battery-powered, wireless, neural recording devices in pig models. I developed a battery-powered, wireless, fully instrumented swine feeding tray using commercially available Arduino and Zigbee devices. This device was used to conduct freely-moving behavioral experiments and the behavioral data was wirelessly correlated with neural recordings conducted simultaneously

Polymeric Encapsulation

I set up a Plasma-Enhanced Chemical Vapor Deposition device within a cleanroom environment for the purpose of depositing monolayer polymeric encapsulants on active electronic implantable devices. I also encapsulated many thin flexible polyimide based microelectronic circuit boards with PolyDiMethylSiloxane (PDMS) as well as Parylene in order to compare the two encapsulation methodologies.

LANGUAGES

English
Urdu
German (A1 Level)
Spanish

PUBLICATIONS

Wireless recording from unrestrained monkeys reveals motor goal encoding beyond immediate reach in frontoparietal cortex

eLife

May 1, 2020

Optogenetically-induced spatiotemporal gamma oscillations and neuronal spiking activity in primate motor cortex

Journal of Neurophysiology

Mar 11, 2015

Detection of optogenetic stimulation in somatosensory cortex by non-human primates–towards artificial tactile sensation

PloS One

Dec 26, 2014

Wireless neurosensor for full-spectrum electrophysiology recordings during free behavior

Neuron

Dec 4, 2014

A fully wireless platform for correlating behavior and neural data from an implanted, neural recording device: Demonstration in a freely moving swine model

Neural Engineering (NER), 2013 6th International IEEE/EMBS Conference

Nov 6, 2013

VOLUNTEERING

Clean up the Hike To the C!
Started a University group to lead and conduct hikes through the Box Springs Mountain Reserve Park and clean up the hiking trail

SeaLife Steward
Water-based volunteer program run by the CA state parks that aims to reduce human-caused disturbance to wildlife and increase public awareness.