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NIKHIL B LAL

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VISION

The unification of all spatially distributed data sensing into a predictive platform that can effectively map or predict pandemics, earthquakes, climate change, and chaotic, macroscopic change. A particular emphasis on hardware enablement, from environmental sensors to wearables, the sensors shall be mass produced, often novel, and accessible.

RESEARCH AND WORK ACTIVITIES

e25bio, Cambridge MA – Lead Engineer

MARCH 2020 - PRESENT

- Owned hardware technology roadmap and led all engineering activities for a seed round funded startup based out of the Engine, the MIT tough tech incubator.
- Developed a series of electromechanical systems to concentrate and purify proteins prior to testing.
- Designed, conducted, and evaluated biological experiments to confirm efficacy of device design in BioSafety Level 2 (BSL2) Lab.
- Led supply chain for hard goods with expected yearly volumes exceeding 12MM units.
- Managed software team on the creation of the e25bio software platform including front-end, back-end and UI dev.

iSee AI, Cambridge MA – Mechanical Engineer

SEPTEMBER 2019 - MARCH 2020

- Designed human-computer interactive sensors for a seed round funded startup based out of the Engine, the MIT tough tech incubator.
- Engineered a Force Sensing Resistor (FSR) based pedal sensor for unique challenges faced by the air braking system, including Schmitt-Trigger design, PCB layout, and assembly manufacturing.
- Developing a steering sensor to ensure humans can regain control of the vehicle in the event of a high-risk failure.

Biobot Analytics, Somerville MA – Hardware Design Engineer

SEPTEMBER 2018 - JUNE 2019

- Led hardware development and owned technology roadmap for a seed round funded startup based out of Greentown Labs. *Patent applied.*
- Sourced and vetted external suppliers to ensure long term viability and short term cost, and took the device through alpha, beta, and gamma prototype stages.
- Built out fully functional hardware lab from 65 sq. ft. storage space to a 500 sq. ft with an R&D testing facility, refreshment space, and hardware development lab.
- Successfully led R&D activities to develop wireless communication from directly within the manhole to enable distributed sensing.

Sensata Technologies (former Texas Instruments), Attleboro MA – Design Engineer

FEBRUARY 2014 - JUNE 2018

- Led process development for emerging technologies in R&D, and developed novel manufacturing techniques. *Patent applied.*
- Created and developed a sensor design that I took from Concept through Launch, 1MM+ units/year. *Patent awarded.*
- Troubleshoot factory and manufacturing issues in excess of \$1MM
- Presented at 4 technical poster conferences including a regional and global conference.

Cornell Rapid Prototyping Laboratory, Ithaca NY – Co-Founder

SEPTEMBER 2013 - JUNE 2014

- Led on-boarding of 8 printers, a laser cutter, and other prototyping tools; developed methodologies for efficient usage including scheduler.
- Advised and mentored engineering students on best practices for 3D printing design.
- Designed lab space and methodology for high throughput rapid prototyping.

Organic Robotics Lab (ORL), Ithaca NY – Researcher

JANUARY 2014 - MAY 2014

- Developed heated Field's Alloy pump to move low temperature metal into prototype hybrid actuators.
- Built soft airfoil with adjustable internal structure and novel actuation.

Leidos, Alexandria VA & Barstow, CA – Systems Engineering Intern

MAY 2013 - DECEMBER 2014

- Aggregated, transformed and managed raw and processed data of various advanced and complex FMV sensors on DARPA aerial sensor unification project.
- Created tools in Java to accomplish these tasks, along with data visualizations that enabled geospatial and Cartesian evaluation of autonomous sensor tracking.
- Developed a distributed back-end cluster for the storage and organization of sensor data output, including establishing Hadoop servers and writing MapReduce functions for efficient data management.
- Worked on-site in Ft. Irwin at Barstow CA building solar trailers to power off-grid distributed sensing systems.

Laboratory for Intelligent Machine Systems (LIMS), Ithaca NY – Undergraduate Researcher

SEPTEMBER 2011 - DECEMBER 2013

- Built prototype "wingmill" for energy harvesting, including design and fabrication of 7ft wings
- Assembled sensor suite to monitor energy data
- Presented research at AIAA conference

EDUCATION

Cornell University, Systems Engineering, Ithaca NY – Master of Engineering (M.Eng.)

AUGUST 2014 - MAY 2015

Cornell University, Mechanical Engineering, Ithaca NY – Bachelor of Science (B.S.)

AUGUST 2010 - MAY 2014

PATENTS

#2020/0072709, *Modular system for upstream wastewater sampling*. Filed 2019

#2020/0072651, *Fluid level sensor apparatus with inter-digitated planar capacitors for directly inserting into a fluid*, Filed 2018

#10,288,513, *Integrated pressure and temperature sensor*, Filed 2016, Granted 2019.

VOLUNTEER EXPERIENCE

Artisan's Asylum PPE Initiative, Somerville MA – Reusable Face Shields Lead

FEBRUARY 2020 - JUNE 2020

- Designed and lead reusable face shields for Personal Protective Equipment (PPE) crisis at the beginning of the SARS-Cov-2 pandemic
- Directed, scheduled, and guided 30 volunteers to build 3,300 shields out of sustainable materials.

Sensata Technologies STEM Program, Attleboro MA – Mentor

SEPTEMBER 2017 - JUNE 2018

- Supported middle school outreach program and taught courses on thermodynamics.
- Mentored a student and guided him through the basics of engineering.

Recommendations

Irene Hu, Postdoctoral Associate, Massachusetts Institute of Technology, - Colleague

Nik and I worked together at Biobot Analytics to design, develop, and build an in situ electromechanical sampling device for wastewater networks. He is a phenomenal and incredibly innovative engineer, possessing both practical skills (including machining, CAD, white sheet design, troubleshooting, problem solving) and theoretical knowledge that spans the gamut of the mechanical engineering field (electrical, solid mechanics, systems, fluids, polymers, etc...). He is able to think quickly and on his feet, understand interdisciplinary needs (e.g. chemistry, biology), and generate creative, out-of-the-box, and yet extremely thoughtful ideas. He also possesses excellent project management and leadership skills, and did an amazing job driving our project forward and leading our hardware team. He is incredibly dedicated as well as a genuinely fun person to work with. I would not hesitate to recommend him for future roles in this field.

Matt Murphy, Mechanical Design Engineer Intern, Titan Advanced Energy Systems - Intern

Nik is an incredible engineer with a contagious drive to get things done. He solves problems efficiently and with ease. He knows how to inspire a team to work to their full potential while teaching them invaluable skills and methodologies. He is an exceptional leader with the expertise to get projects done, no matter the deadline (even if it means leading an incubator-wide build sprint). I feel honored and fortunate to have worked under him. I strongly recommend anyone looking for a well-respected, motivated and inspirational technical leader to send Nik a message.