

CURRICULUM VITAE

Sathyakumar S Kuntaegowdanahalli

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EDUCATION

School & Location	Degree/ Certificate	Year	Field
Florida International University, Miami, FL	Ph.D.	Aug 2018 – Dec 2022	Biomedical Engineering
University of Cincinnati Cincinnati, OH	M.S.	Sep 2006 - June 2009	Electrical Engineering
Birla Institute of Technology and Science Pilani, India	B.E. (Hons)	Aug 2001 - June 2006	Electronics and Instrumentation
Birla Institute of Technology and Science Pilani, India	M.Sc. (Hons)	Aug 2001 - June 2006	Mathematics

EMPLOYEMENT & WORK EXPERIENCE

Dec 2021-Present	<p>Senior Research Scientist, Institute for Integrative and Innovative Research (I³R), University of Arkansas, Fayetteville, Arkansas, US</p> <ul style="list-style-type: none"> Responsible for conceptualizing and performing projects related to areas of neural engineering, and integrative systems neuroscience. Handle regulatory submissions to the FDA, IRB. Conduct clinical evaluation of medical devices.
Jan 2018-Dec 2021	<p>Research Specialist II, Adaptive Neural Systems Lab, Florida International University, Miami, US</p> <p><i>Translating novel neurotechnology from bench to bedside:</i></p> <ul style="list-style-type: none"> Managed research projects (including those involving human subjects) related to the development of neurotechnology devices. Presented research findings at scientific meetings and publish in refereed journals. Played key role in developing grant proposals to federal and private funding agencies. The team received over \$7 million in funding. Handled regulatory submissions to the FDA for new and existing medical devices at the ANS lab.

May 2011-Jan 2018	<p>Research Scientist, Adaptive Neural Systems Lab, Florida International University, Miami, US</p> <p><i>Working to develop a next generation hand prosthesis that will allow amputees to feel.</i></p> <ul style="list-style-type: none"> • Developed a sensor device to track hand span during clinical research experiments. • Engaged in the development of a lead management and packaging system for implantable neural electrodes. Developed an improved process to fabricate implantable neural electrodes. • Developed multiple clinical research software tools using Python to manage and conduct research experiments. • Carried out verification and validation activities for an implantable neural stimulation device (FDA-class III medical device). • Created and currently maintaining DHF, DMR for a class III medical device. • Prepared successful regulatory submission (IDE) to the FDA for a class III medical device. Participated in review meetings with the FDA. • Engaged in the development of an implantable inline connector for neural stimulation and recording applications. • Assisted in preparing and submitting grants to funding agencies (NIH/DARPA/CDMRP). Team received over \$2 million in funding.
January 2011-April 2011	<p>Graduate Assistant, Adaptive Neural Systems Lab, Florida International University, Miami, US.</p> <ul style="list-style-type: none"> • Developed a process to fabricate implantable neural electrodes. • Conducted Verification and Validation of DSP firmware scripts written to control an implantable neural stimulation device. • Prepared pre-submission documents (Q-Sub: Pre-IDE) to be submitted to the FDA. • Developed clinical protocols to test novel neural stimulation device.
August 2009-December 2010	<p>Graduate Research Associate, Center for Adaptive Neural Systems, Arizona State University, Phoenix, AZ</p> <ul style="list-style-type: none"> • Fabricated intrafascicular neural electrodes for non-clinical testing. • Designed custom hardware circuits to link commercial myoelectric hand prosthesis to a commercial neural stimulation device (class III medical device). Conducted verification and validation activities to test fabricated hardware units. Documented design and testing activities for FDA-IDE submission. • Developed microcontroller firmware modules to link custom hardware unit with neural stimulation device. Developed test scripts in python to verify and validate developed firmware modules in neural stimulation device. • Conducted FMECA analysis on modified neural stimulation device with custom hardware circuit.
June 2007- May 2009	<p>Graduate Research Assistant to Dr. Ian Papautsky, BioMicro Systems Lab, University of Cincinnati, Cincinnati, US</p> <p><u>Thesis Project:</u> High throughput separation of microparticles using inertial microfluidics.</p> <ul style="list-style-type: none"> • Designed particle separators using spiral microchannel geometries for multiple particle separation • Fabricated the designed microchannels using soft lithography process • Successfully optimized microchannel design to demonstrate separation of a three particle mixture
July 2005- June 2006	<p>Co-op Engineer, Cypress Semiconductor Corporation, Bangalore, India</p> <ul style="list-style-type: none"> • Designed a fully configurable I2C/SMBus controller using Verilog Preprocessor • Developed a software tool using TCL/Tk to estimate the dynamic IR-drop for digital systems

	<ul style="list-style-type: none"> Developed validation methods for fast debug of silicon failures in PCI Express products using Perl and C++
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TRAININGS AND COURSES

- Attended two day training session on “Medical Device Risk Management A to Z - Best Practices for Effectiveness and Efficiency”.
- Attended two day training session on “FDA's GMP Expectations for Phase I Clinical Trials”.
- Completed Medical Product Development certification from UC-Irvine Extension.
- Completed Regulatory Affairs Management certification from UC-Irvine Extension.

AWARDS AND ACHIEVEMENTS

2020	Part of team that was placed 3 rd in “2020 Cade Prize for Innovation” (CADE Museum)
2020	Part of team selected for C3i Concept to Clinic: Commercializing Innovation Programs of the National Institutes of Health. August (C3i) 2020.
2009-2010	Recipient Science Foundation Arizona Fellowship, Arizona State University
2006 - 2007	Recipient of the University Graduate Scholarship, University of Cincinnati
2008	Recipient of the Institute of Nanoscale Science and Technology Grant, University of Cincinnati

PUBLICATIONS

Journal Publications

- Jung R, Abbas JJ, **Kuntaegowdanahalli S**, Thota AK. “Bionic intrafascicular interfaces for recording and stimulating peripheral nerve fibers.” *Bioelectronics in Medicine* 1(1), 55-69 (2018)
- A. E. Pena, **S. S. Kuntaegowdanahalli**, J. J. Abbas, J. Patrick, K. W. Horch, and R. Jung, "Mechanical fatigue resistance of an implantable branched lead system for a distributed set of longitudinal intrafascicular electrodes," *J Neural Eng*, vol. 14, p. 066014, 2017.
- A. K. Thota, **S. Kuntaegowdanahalli**, A. K. Starosciak, J. J. Abbas, J. Orbay, K. W. Horch, and R. Jung, "A system and method to interface with multiple groups of axons in several fascicles of peripheral nerves," *Journal of neuroscience methods*, vol. 244, pp. 78-84, 2015.
- S. S. Kuntaegowdanahalli**, A. A. S. Bhagat, and I. Papautsky, “Inertial microfluidics for continuous particle separation in spiral microchannels,” *Lab on a Chip*, vol. 9, pp. 2973–2980, 2009.
- A. A. S. Bhagat, **S. S. Kuntaegowdanahalli** and I. Papautsky, “Continuous particle separation in spiral microchannels using Dean flows and differential migration”, *Lab on a chip*, vol. 8, pp. 1906-1914, 2008.
- A. A. S. Bhagat, **S. S. Kuntaegowdanahalli** and I. Papautsky, “Inertial microfluidics for continuous particle filtration and extraction”, *Microfluid. Nanofluid.*, vol. 7, pp. 217-226, 2009.
- A. A. S. Bhagat, **S. S. Kuntaegowdanahalli**, and I. Papautsky, “Inertial microfluidics for sheath-less high-throughput flow cytometry,” *Biomed. Microdev.*, vol. 12, pp. 187–195, 2010

Conference Proceedings

- SS Kuntaegowdanahalli**, A Pena, A Thota, JJ Abbas, R Jung. Neural enabled prosthesis with an intrafascicular peripheral nerve interface: A long term First in Human Study. 4th Annual Neural Engineering Symposium, Miami, FL, October 26-27, 2020 (Virtual talk (**Kuntaegowdanahalli**)).
- SS Kuntaegowdanahalli**, A Pena, A Thota, JJ Abbas, R Jung. A First-in-Human trial of a Neural Enabled Prosthetic Hand System designed to provide sensory feedback. Abstract #MHSRS-20-01846, (Poster (**Kuntaegowdanahalli**)) at Military Health Systems Research Symposium. August 24-27, 2020, Kissimmee, FL, USA.
- R Jung, JJ Abbas, **SS Kuntaegowdanahalli**, KW Horch, AJ Berger, AK Thota, AE Pena, L Rincon-Gonzalez, BK Hillen, D Aguilar, T Bukacheski, JL Horstmyer, BA Swanson, J Leavens, JF Patrick. A Neural Enabled Prosthetic Hand System for Sensory Restoration, 42nd Annual International Conference

of the IEEE Engineering in Medicine and Biology Society, Montreal, Canada, July 20-24, 2020 via the EMBS Virtual Academy (Virtual talk (**Kuntaegowdanahalli**)).

4. Abbas, JJ, **S Kuntaegowdanahalli**, A Thota, A Pena, R Jung. Development of a sensory enabled neuroprosthetic hand systems. Abstract #MHSRS-18-2122 – Rehabilitation Following Limb Trauma and Amputation, (Oral talk (Jung) at Military Health Systems Research Symposium. August 20-23, 2018, Kissimmee, FL, USA
5. R Jung, **S. S. Kuntaegowdanahalli**, A. K. Thota, A. E. Pena, K. Horch, J. Patrick, and J. J. Abbas. Neural-enabled prosthetic hand system to restore sensation in upper-limb amputees. Program No. 404.10. 2018 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2018. Online.
6. J Abbas, **S. S. Kuntaegowdanahalli**, K. Horch, L. R. Gonzalez, A. E. Pena, A. K. Thota, B. Hillen, D. Aguilar, R. Jung. Assessment of functional benefits afforded by sensory-enabled prostheses to upper-limb amputees. Program No. 404.09. 2018 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2018. Online.
7. Rojas D, D Aguilar, A Pena, **S Kuntaegowdanahalli**, L Rincon Gonzalez, R Jung. Design and Development of a Fragile Object Simulator. 8th Annual BME Undergraduate Research Day, Miami, FL. October 18, 2017. (Poster: Rojas)
8. A. K. Thota, **S. Kuntaegowdanahalli**, R. Siu, J. Abbas, and R. Jung, "Evaluation of an implantable intrafascicular electrode System in rodents," in *45th Annual Meeting of the Society for Neuroscience*, Chicago, Illinois, 2015.
9. A. K. Thota, **S. Kuntaegowdanahalli**, K. Horch, J. Abbas, and R. Jung, "Biocompatibility testing of an implantable intrafascicular electrode system in rabbits," in *45th Annual Meeting of the Society for Neuroscience*, Chicago, Illinois, 2015.
10. A. E. Pena, **S. S. Kuntaegowdanahalli**, J. J. Abbas, and R. Jung, "Mechanical fatigue testing of an implantable intrafascicular electrode system," in *Society of Neuroscience*, Chicago, Illinois, 2015.
11. Rincon-Gonzalez L, **Kuntaegowdanahalli SS**, Abbas JJ, Horch KW, and Jung R, "Experimental assessment of fitting procedures for a neural enabled prosthetic hand," in *45th Annual Meeting of the Society for Neuroscience*, Chicago, Illinois, 2015.
12. Thota AK, **S Kuntaegowdanahalli**, J Orbay, AK Starosciak, J Abbas, K Horch, R. Jung. A Multi-Lead Multi-Electrode System for Neural-Interface Enabled Advanced Prostheses. 2013 29th Southern Biomedical Engineering Conference (Miami, FL, May 3-5, 2013). pg. 109-110. IEEE Xplore DOI 10.1109/SBEC.2013.63.
13. Pena, A.; **Kuntaegowdanahalli, S.S.**; Abbas, J.; Jung, R., "Design and Development of Hand-opening and Pinch Force Sensors," Biomedical Engineering Conference (SBEC), 2013 29th Southern, vol., no., pp.167, 168, 3-5 May 2013. DOI: 10.1109/SBEC.2013.92
14. **S. S. Kuntaegowdanahalli**, A. A. S. Bhagat and I. Papautsky, "Continuous multiparticle separation using deterministic focusing in spiral microchannels", in Proc. International Conference on Solid-State Sensors and Actuators (Transducers '09), Denver, CO, Jun 21-25, 2009
15. A. A. S. Bhagat, **S. S. Kuntaegowdanahalli** and I. Papautsky, "High-throughput flow cytometry using inertial microfluidics," in Proc. Of the 13th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS2009), Jeju, South Korea, Nov 1-5, 2009

PATENTS GRANTED

- US 9,427,565 B2, August 30, 2016. "Modular Multi-channel Inline Connector System", **Sathyakumar S Kuntaegowdanahalli**, James J. Abbas, Ranu Jung, Kenneth Horch. Priority Nov 7, 2012.
- US 9,409,009 B2, August 9, 2016. "Multi-lead Multi-electrode Management System." Anil K. Thota, Ranu Jung, **Sathyakumar S Kuntaegowdanahalli**, Priority, Nov 7, 2012.
- US 10,384,057 B2, August 20, 2019. "Multi-lead Multi-electrode Management System", Anil K. Thota, Ranu Jung, **Sathyakumar S Kuntaegowdanahalli**.