Vijay Sadashivaiah

Ph.D. Student in Computer Science

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Education

Rensselaer Polytechnic Institute — Troy, NY
- Doctor of Philosophy in Computer Science — January 2021 - Present
- Master of Science in Computer Science — December 2022 (expected)
- GPA: 4.00/4.00

Johns Hopkins University — Baltimore, MD
- Master of Science in Biomedical Engineering — August 2015 - May 2017
- GPA: 3.87/4.00

PES Institute of Technology — Bangalore, India
- Bachelor of Engineering in Electrical Engineering — August 2011 - May 2015
- Visiting student at Massachusetts Institute of Technology — 2014
- GPA: 9.32/10.00

Skills

Programming: (Proficient) Python, MATLAB, R, Bash, LaTeX; (familiar) C, Java, Perl
Frameworks and tools: Pytorch, TensorFlow, Keras, CUDA, MPI, Git, NEURON, Docker
Relevant courses: Learning Theory, Information Theory, Machine Learning (ML) from Data, ML and Optimization, Deep Learning, Parallel Computing, Probability Theory, Image Processing

Research Experience

Rensselaer Polytechnic Institute — Troy, NY
Research Assistant, Advisors: Profs. James Hendler and Chris R. Sims — January 2022 - Present

- Exploring research ideas at the intersection of model interpretability and transfer learning
- Spearheading a joint collaboration between scientists at IBM Research and Rensselaer

IBM Thomas J. Watson Research Center — Remote
Summer Intern in Trustworthy AI group — May 2021 – September 2021

- Worked on multi-armed bandit and reinforcement learning based approaches to improve transfer learning
- Explored visual explanation techniques to understand transfer learning algorithms

Lieber Institute for Brain Development — Baltimore, MD
Staff Scientist in Machine Learning and Data Science — August 2017 - January 2021

- Explored novel data-driven methods on heterogeneous datasets to identify the underlying biological pathways involved in Schizophrenia and other neurodevelopmental disorders
- Applied transfer learning based methods to extract relevant biomarkers in neuroimaging data

Johns Hopkins University — Baltimore, MD
Research Assistant in Neuromedical Control Systems Lab — September 2015 – May 2017

- Spearheaded collaboration between 3 principal investigators for masters thesis
- Constructed probabilistic, functional & mechanistic models of a mammalian nerve fiber and quantified different interactions to test the performance of electrical nerve stimulation in treating chronic pain

École Polytechnique Fédérale de Lausanne Lausanne, Switzerland
Summer Researcher in Laboratory of Sensory Processing June 2015 - August 2015

- Accepted into a highly competitive international research program (5% acceptance rate).
- Analyzed voltage–sensitive dye images of mouse neocortex to study the neural circuits involved in goal-directed sensorimotor interactions

Massachusetts Institute of Technology Cambridge, MA
Visiting Student Researcher in Camera Culture Lab June 2014 - September 2014

- Designed a high–speed imaging system to capture light in motion (Bachelor's thesis)
- Improved the depth resolution of the conventional imaging system using multi-frequency light sources

Publications

1 Brate, R., Dang, M. H., Hoppe, F., He, Y., Meroño-Peñuela, A., **Sadashivaiah, V.** Improving Language Model Predictions via Prompts Enriched with Knowledge Graphs. ISWC workshop on Deep Learning for Knowledge Graphs 2022.

2 Murugesan, K*., **Sadashivaiah, V.***, Luss, R., Shanmugam, K., Chen, P. Y., & Dhurandhar, A. Auto-Transfer: Learning to Route Transferable Representations. ICLR 2022. (* equal contribution)

3 **Sadashivaiah, V.**, Tippani, M., Page, S. C., Kwon, SH, Bach, S. V., Bharadwaj, R. A., Hyde, T. M., Kleinman, J. E., Jaffe, A. E., Maynard, K.R. SUFI: An automated approach to spectral unmixing of fluorescent biological images. BioRxiv 2021.

4 Tran, M. N., Maynard, K. R., Spangler, A., Torres, L. C., **Sadashivaiah, V.**, Tippani, M., ... & Jaffe, A. E. Single-nucleus transcriptome analysis reveals cell type-specific molecular signatures across reward circuitry in the human brain. Neuron 2021.

5 Ren, M., Hu, Z., Chen, Q., Jaffe, A., Li, Y., **Sadashivaiah, V.**, Li, Y., ..., Yang, F. KCNH2-3.1 mediates aberrant complement activation to impair hippocampal-medial prefrontal circuitry associated with working memory deficits. Molecular Psychiatry 2020.

6 **Sadashivaiah V.**, Sacre P., Guan Y., Anderson W. S., Sarma S. V. Modeling the interactions between stimulation and physiologically induced APs in a mammalian nerve fiber: dependence on frequency and fiber diameter. Journal of Computational Neuroscience 2018.

7 **Sadashivaiah, V.**, Sacré, P., Guan, Y., Anderson, W. S., Sarma, S. V. Studying the Interactions in a Mammalian Nerve Fiber: A Functional Modeling Approach. EMBC 2018.

8 **Sadashivaiah, V.**, Sacré, P., Guan, Y., Anderson, W. S., Sarma, S. V. Selective Relay of Afferent Sensory Induced Action Potentials from Peripheral Nerve to Brain and the Effects of Electrical Stimulation. EMBC 2018.

9 **Sadashivaiah, V.**, Sacré, P., Guan, Y., Anderson, W. S., Sarma, S. V. Electrical neurostimulation of a mammalian nerve fibers: A probabilistic versus mechanistic approach. EMBC 2017.

10 Gunnarsdottir, K., **Sadashivaiah, V.**, Kerr, M., Santaniello, S., Sarma, S. V.; Using Demographic and Time Series Physiological Features to Classify Sepsis in the Intensive Care Unit. EMBC 2016.

11 Kyriakatos A., **Sadashivaiah V.**, Zhang Y., Motta A., Auffret M., Petersen C. H. Voltage-sensitive dye imaging of mouse neocortex during a whisker detection task. Neurophotonics 2016.

Conference Abstracts

1 **Sadashivaiah, V.**, Goldman, A., Ulrich, B., Radulescu, E., Breman, K. F., Mattay, V. S., Weinberger, D. R., Chen, Q. Using machine learning to identify novel neuroimaging phenotypes associated with cognitive dysfunction in Schizophrenia. SfN 2019.

2 **Sadashivaiah, V.**, Goldman, A., Ulrich, B., Straub, R. E., Calliott, J. H., Breman, K. F., Mattay, V. S., Weinberger, D. R., Chen, Q.; Exploring Shared Brain Cognitive Networks and the Related Genetic Components using Three-way Parallel ICA. SoBP 2018.

Institutional & Community Experience

Center for Social Concern – Johns Hopkins University Baltimore, MD
Volunteer November 2015 – September 2020

- Refurbishing and repairing old computer systems before donating them to local schools in Baltimore
- Teaching basic computer skills like programming and word processing to students in 3rd through 5th grade

Graduate Representative Organization – Johns Hopkins University Baltimore, MD
Advocacy Chair May 2016 – May 2017

- Organized town halls every quarter with university administration to advocate graduate student needs and issues
- Facilitated discussion of topics including student healthcare, maternity leave and dining options on campus
- Assisted Social Chairs in organizing social and cultural events on campus

Varsity Field Hockey – PES Institute of Technology Bangalore, India
Goal-Keeper May 2012 – May 2014

- Participated in practices, weekly drills, competitions, and community service events
- Drafted for state team trails at 2013 inter-collegiate tournament

Awards and Fellowships

Best Poster award - International Semantic Web Summer School	2022
Distinguished Biomedical Engineering Fellowship - Johns Hopkins University	2015 - 2017
Data Incubator Challenge (Semi-finalist) - The Data Incubator	2017
Foundation Leenaards' Summer Research Fellowship - EPFL	2015
University Merit Scholarship - PES Institute of Technology	2011 - 2015
“Code Something that Matters" Scholarship - Vecna Robotics	2015
TEQIP Travel Grant - PES Institute of Technology and Government of India	2014, 2013
Vertech City Challenge (Global finalist) - Vertech Symposium	2014
Best Student Project - IEEE International Conference on Impact of E-Technology	2014
Intel Global Challenge (Global finalist) - UC Berkeley	2013
Biotechnology Entrepreneurship Student Teams - Department of Biotechnology, India	2013
Go Green in the City (Global semi-finalist) - Schneider Electric	2013

Interests

Rock Climbing, Running, Hiking, Backpacking, Homelabbing and recently into Swimming