

Sachin Salim

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EDUCATION

University of Southern California, Los Angeles, CA

PhD - Electrical and Computer Engineering

Advisor: Dr. Anand Joshi, Biomedical Imaging Group

Aug 2024 – Present

University of Michigan, Ann Arbor, MI

Masters - Data Science and Machine Learning, Electrical and Computer Engineering

Dec 2023

GPA: 4.00/4.00

Courses: Computer Vision (A+), M. Methods for Signal Processing & Machine Learning (A+), Data Analysis (A+)

Graduate Certificate in Computational Neuroscience

Dec 2023

Courses: Neural Engineering (A+), Computational Neuroscience*

Indian Institute of Technology Kanpur, India

Bachelor of Technology - Computer Science and Engineering

May 2018

PUBLICATIONS & PRESENTATIONS

- Computational modeling of electrophysiology recordings can predict octopus arm movement, Nitish Gedela, **Sachin Salim**, Julianna Richie, Cynthia Chestek, Anne Draelos, Galit Pelled (*In preparation*)
- Real-time behavioral analysis on octopus arm using transfer learning and streaming dimension reduction (Oral Presentation), **Sachin Salim**, Neural Networks Journal Club, University of Michigan, October 2023
- Translating Cartoon to Natural Images using Stable Diffusion (Poster Presentation), **Sachin Salim**, Shrikant Arvasu, Nowrin Mohamed, December 2023

RESEARCH EXPERIENCE

Draelos Lab, University of Michigan

May 2023 – Present

Research Assistant | Mentor: Dr. Anne Draelos

- Led a project analysing octopus arm motion using deep learning (DeepLabCut) & unsupervised (ProSVD) methods
- Discovered significant statistical variations in kinematic features to stimulations across different arm locations

Cortical Neural Prosthetics Lab, University of Michigan

Jan 2023 – Apr 2023

Research Assistant | Mentors: Dr. Cynthia Chestek, Joseph Costello

- Developed a real-time finger kinematics prediction model using reinforcement learning tools (Gym, RLlib-Ray)
- Finetuned a feed-forward neural network that decodes the neural signals from motor cortex of non-human primates

Movement Control Lab, Indian Institute of Science, Bengaluru, India

Oct 2020 - Dec 2020

Research Intern | Mentors: Dr. Aditya Murthy, Dr. Varsha Vasudevan

- Investigated internal fast feedback controls in hand movements through statistical analyses on inter-trial variability

Computational Economics Lab, Indian Institute of Technology Kanpur, India

Jan 2018 - Apr 2018

Undergraduate Researcher | Mentor: Dr. Swaprava Nath

- Quantified environmental improvement when passengers share ride and follow route using minimum spanning trees

TEACHING

Graduate Student Instructor, University of Michigan

- **EECS 504: Graduate Computer Vision**, Robotics, Dr. Jason Corso

Aug 2023 – Dec 2023

- **EECS 442: Computer Vision**, Computer Science & Engineering, Dr. David Fouhey

Jan 2023 – Apr 2023

PROFESSIONAL EXPERIENCE

- Skellam AI**, Bengaluru, India *Aug 2021 - Aug 2022*
Applied Machine Learning Engineer
- Created a marketing automation tool featuring hyper-personalized recommendations using collaborative filtering
 - Implemented activity tracking system for anonymous customers, boosting quarterly revenue by 130%
- Adobe Inc.**, Noida / Bengaluru, India *June 2018 - July 2021*
Software Development Engineer – 2
- Collaborated cross-functionally with managers, design team, and engineers to develop ‘Adobe Captivate’
 - Implemented a space-efficient solution using shape objects for incorporating text, reducing build size by 27%
- Samsung R & D**, Bengaluru, India *May 2017 - July 2017*
Software Development Intern
- Implemented IoTivity on Samsung’s ‘ARTIK’ Smart IoT platform, addressing dynamic connectivity needs

PROJECTS

- Modeling APL-Mediated Local Inhibition in the Fruit Fly Mushroom Body** *Sep 2023 – Dec 2023*
- Demonstrated that local inhibition regulates sparsity of Kenyon Cell (KC) outputs comparably to global inhibition
 - Substantiated through simulations that local-random PN-KC connectivity enhances odor recognition accuracy
- Translating Cartoon to Natural Images using Stable Diffusion** *Oct 2023 – Dec 2023*
- Trained a latent diffusion model to unconditionally generate images of both domains
 - Used a pre-trained image captioning model (BLIP) as a guidance to condition the diffusion generation
- Brain Tumor Segmentation using an ensemble of 3D U-Nets** *Oct 2022 - Dec 2022*
- Implemented highly scalable 3D U-net, a deep CNN classifier, to segment tumor subregions
 - Created an ensemble of models trained with different hyper-parameters achieving a high dice score of 80.5%
- Parkinson's Disease Progression Prediction** *Feb 2023 - Apr 2023*
- Developed a machine learning regression model to identify biomarkers using protein and peptide data
 - Submitted the model with 63.4% sMAPE score to AMP PD program's prestigious Kaggle coding competition
- Seizure Detection and Closed-Loop Control** *Mar 2023 – Apr 2023*
- Developed control methods using Simulink and explored mathematical frameworks to understand seizure dynamics
 - Detected seizure on EEG data via SVM-trained machine learning model with 96.9% accuracy

OUTREACH ACTIVITIES

- Volunteer, **BrainsRule!** - Outreach project to get middle schoolers excited about brain *Mar 2023*
- Demonstrated the motor control in arms by letting them send electrical signals from their arm to my arm
- Member, **Neural Networks Journal Club** *Jan 2023 – Present*
- Member, **Translational Neural Engineering Journal Club** *Jan 2023 – Present*

SKILLS

Languages: Python, C/C++, Java, JavaScript, MATLAB, SQL, Julia
Technologies: PyTorch, Neuron, COMSOL, Jupyter, AWS, Git/GitHub, Simulink, LaTeX

LEADERSHIP & EXTRA-CURRICULAR

- Head of Events, Udghosh - IIT Kanpur inter-collegiate sports meet *Jan 2017 – Oct 2017*
- Member, Athletics: represented IIT Kanpur and won 10+ medals in national meets *Sep 2014 – Mar 2018*

REFERENCES

- Anand Joshi** (University of Southern California) ajoshi@usc.edu
- Anne Draelos** (University of Michigan) adraelos@umich.edu
- Cynthia Chestek** (University of Michigan) cchestek@umich.edu
- Swaprava Nath** (IIT Bombay/Kanpur) swaprava@cse.iitb.ac.in
- David Fouhey** (NYU/University of Michigan) david.fouhey@nyu.edu