Sachin Salim

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EDUCATION

University of Michigan, Ann Arbor, MI
Masters - Data Science and Machine Learning, Electrical and Computer Engineering *Dec 2023*
GPA: 4.00/4.00
Courses: M. Methods for Signal Processing & Machine Learning (A+), Computer Vision (A+), Data Analysis (A+)

Graduate Certificate in Computational Neuroscience *Dec 2023*
Courses: Neural Engineering (A+), Computational Neuroscience*

Indian Institute of Technology Kanpur, India *May 2018*
Bachelor of Technology - Computer Science and Engineering

PUBLICATIONS

- Computational modeling of electrophysiology recordings can predict octopus arm movement, Nitish Gedela, **Sachin Salim**, Julianna Richie, Autumn M. Svoboda, Cynthia Chestek, Anne Draelos, Galit Pelled *(In preparation)*

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

FELLOWSHIPS & ACHIEVEMENTS

- Performer of the Quarter, Skellam AI *Mar 2022*
- KVPY Fellowship by Indian Institute of Science (for securing 78th rank in India) *Feb 2014*
- Qualified to national stage in Maths, Physics and Chemistry Olympiads conducted by Govt of India *Jan 2014*
- Secured 583rd rank among 1.3 Million candidates in JEE Main - Indian Engineering Entrance Exam *Apr 2014*

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*

TALKS

Neural Networks Journal Club, University of Michigan *March 2023*
- Real-time behavioral analysis on octopus arm using transfer learning and streaming dimension reduction

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

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

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