Tarun Sharma

Personal Data

Place and Date of Birth: Bangalore, India | 10 September 1994
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Research Interests

Theoretical and Computational Neuroscience, Computer Vision and Machine Learning

Education

Sept 2018 - Present	PhD in Computation & Neural Systems, Caltech, Pasadena, California Advisor: Prof. Michael Dickinson
Aug 2013 - May 2017	B.E in Computer Science & Engineering, PESIT, Bangalore, India CGPA: 9.30/10
May 2013	High School, Frank Anthony Public School (I.S.C), Bangalore, India Percentage: 96.2/100

Previous research Experience

Aug 2017 - Jun 2018	Research Assistant with Thomas Serre, Brown University, Providence, Rhode Island, U.S.A
Jan 2017 - June 2017	Intern at SAP Labs, Bangalore, India
May 2016 - Aug 2016	Research Intern with Thomas Serre, Brown University, Providence, Rhode Island, U.S.A
Aug 2015 - May 2016	Research Intern at Center for Cloud Computing and Big Data, PESIT, Bangalore, India
May 2015 - Aug 2015	Summer Research Intern at MAD Street Den Systems, Chennai, India
June 2014 - Aug 2014	Summer Intern at Microsoft Mobile Innovation Lab, PESIT, Bangalore, India

Publications

Granted July 2019	Thematic segmentation of content using deep learning and contextual cues - **US Patent with SAP Labs** *link to patent*
Published May 2019	Diverse Food-Sensing Neurons Trigger Idiothetic Local Search in Drosophila **Current Biology Vol 29 Issue 10** *link to paper*
Published April 2018	Neural computing on a raspberry pi: Applications to zebrafish behavior monitoring **Visual observation and analysis of Vertebrate And Insect Behavior** (ICPR 2018) *link to paper*
Published March 2018	Learning to predict action potentials end-to-end from calcium imaging data **IEEE Conference on Information Sciences and Systems** (CISS 2018) *link to paper*
Published Aug 2017	What are the visual features underlying human versus machine vision? **ICCV Workshop on Mutual Benefits of Cognitive and Computer Vision** (ICCV 2017) *link to paper*
Published July 2016	Towards Quantifying the Amount of Uncollected Garbage through Image Analysis - **Tenth Indian Conference on Computer Vision, Graphics and Image Processing** (ICVGIP 2016) *link to paper*
Published April 2016	NAVI - Navigation Assistance for the Visually Impaired - **International Conference on Computing, Communication and Automation** (ICCCA 2016) *link to paper*
Published March 2016	Real Time Video Content Based Contextual Advertising - **International Conference on Advancement in Computer Engineering & Information Technology** (ACEIT 2016) *link to paper*

Ongoing Projects

Aug 2019 - Current | Analysis of stabilization circuit of the fruit fly
Professor Michael Dickinson, Caltech
Manipulation of neural activity to determine the neural underpinnings of the flight stabilization circuit. Involves 3D head tracking using rendering engine and neural networks, image processing to track wing motion, a behavioral rig which spins the fly using a motor, genetic manipulations of the neurons in flight using lasers and subsequent data analysis. Behavioral rig operates using ROS.

Other Projects

Mar 2019 | Analyzing Deep Neural Networks for 3D Scene Representation as a Proxy for the Brain's Geometric Engine : Analyzing representations in DeepMind's GQN network using systems neuroscience approaches. (Caltech, USA)

July 2018 | Smart Playroom : Automated behavioural analysis (using computer vision) of children playing in a naturalistic setup, in order to identify early indicators of Autism. (Brown University, USA)

July 2017 | Smart detection and visualization of uncollected garbage : Detection, classification and spot fix detection of garbage dumps using computer vision (PESIT, Bangalore)

May 2016 | DARPA Research Project : Towards more humanlike learning with 3D shape information (analyzing and visualizing representations of deep networks when trained with 3D information) (Brown University, USA)

Feb 2016 | Pothole Detection and Ranking using Machine Learning and mobile phone accelerometer data (Inmobi Hackday Spring, India)

July 2015 | Assistive Vision Simulator - Simulator using oculus rift, to test out the best form of feedback (tactile vs audio) to be used for assistive technologies(MIT RedX)

Jan 2015 | Sense Makers - Location based semantic data visualization for spreading awareness on current issues (MIT Design Innovation Workshop, Gujarat)

Apr 2014 | Hands Free Cake Book - Windows store app which uses computer vision and allows scrolling using hand gestures (Microsoft bootcamp, PESIT)

Achievements

Nov 2019 | Chen Graduate Innovator Grant, **Chen Institute, Caltech**

Awarded this grant for a side project on our proposal, Sensorimotor Computations Underlying the Praying Mantis Predatory Strike.

Dec 2014 | Runner up at "What the Hack 2.0", **SAP Labs India**

Was awarded this prize for idea and execution of "Voice prompted Contextual Advertisements" at a hackathon held by SAP Labs India, which consisted of students from all over the country and also SAP Labs employees.

Feb 2015 | Best Out of the Box Idea, **SimpliLearn Solutions India**

Was awarded this prize for idea and execution at the hackathon "SimpliHack", conducted by SimpliLearn, which consisted of participants (including employees) from all over the country. Idea was on how to make a Smarter Education System, with Real time doubt tagging, a ranking system and Geolocation to find people to work with.

July 2015 | Certificate of Appreciation, **MIT Media Labs** and **LV Prasad Eye Institute**

Was one among the 65 students selected from a pool of 7000 plus applicants from all over the country to participate in the seven day RedX Workshop on technological innovation and advancements in healthcare for the human eye, held in collaboration with LV Prasad Eye Institute at Hyderabad.

Jan 2015 | Certificate of Participation, **MIT Media Lab**

Was one among the 300 students selected from a pool of 8000 plus applicants from all over the country including engineers,designers,entrepreneurs etc. , to participate in the 'civic innovation' track at the MIT Media Lab 5th Design Innovation Workshop 2015 at Gandhinagar, Gujarat.

July 2014 | Certificate of Recognition, **Microsoft Corporation, India**

Was awarded this prize for of the initial students from college to have built and published a Windows Store app, 'Hands Free Cake Book'. The app currently has 5000 plus downloads from 120 countries.

June 2013 | Certificate of Merit, **Frank Anthony Public School, Bangalore**

Was awarded this prize for topping the school in the class 12 ISC board examination in the science stream.