SUSHRUT THORAT

Contact Information

Address:
Platolaan 680 A
6525 KJ Nijmegen, NL

mobile: +31-6-85-47-67-20
email: sushrut.thorat94@gmail.com
webpage: http://novelmartis.github.io

Interests

The role of attention and awareness in the brain, the nature of object-scene interactions in the visual system, problem of Identity

Education

PhD in Cognitive Neuroscience *Ongoing*
Donders Centre for Cognition, Radboud University, The Netherlands

M.Sc. (Hons.) in Cognitive Neuroscience *July 2017*
Center for Mind/Brain Sciences (CIMeC), University of Trento, Italy

B.Tech. in Engineering Physics *August 2015*
Department of Physics, Indian Institute of Technology - Bombay (IIT-B), India

Theses

M.Sc. Thesis: Using Convolutional Neural Networks to measure the contribution of visual features to the representation of object animacy in the brain
Advisor: Marius Peelen *Spring 2017*
Representations in the CNN layers correlate highly with the visual ventral stream representations, even in the case of stimuli confounding visual features as in Proklova, et.al., 2016. Visual features are rich contributors to semantic representations. This project specifically aims to assess the level of visual contribution to the representation of 'animacy' in ventral temporal cortex, using a CNN as a model for feed-forward visual information processing.

B.Tech. Thesis: Quadcopter Flight Control using Modular Spiking Neural Networks
Advisor: Bipin Rajendran *Spring 2015*
We developed a model-based control scheme for velocity-waypoint navigation in the presence of wind, noisy and delayed IMU data, for a quadcopter. We built small spiking neural networks with simple spike-triggered adaptive synapses for implementing arithmetic operations. We outlined a method of developing a spiking neural network for quadcopter Control to analyse the gain in computational power and stability provided by spike-based networks.

Publications

Thorat, S. and Choudhari, V. (2016) Implementing a Reverse Dictionary, based on word definitions, using a Node-Graph Architecture, *Proceedings of COLING 2016, the 26th International Conference on Computational Linguistics: Technical Papers*, Osaka, 2016, pp. 2797 – 2806.

Thorat, S. and Rajendran, B. (2015) Arithmetic computing via rate coding in neural circuits with spike-triggered adaptive synapses, *2015 International Joint Conference on Neural Networks (IJCNN)*, Killarney, 2015, pp. 1 – 8. doi: 10.1109/IJCNN.2015.7280822

Conference Talks/Posters

Using convolutional neural networks to measure the contribution of visual features to the representation of object animacy in the brain
(Poster) *Donders Discussions*, Nijmegen, 2017
(Talk & Poster) *Rovereto Workshop on Concepts, Actions and Objects (CAOs)*, Rovereto, 2017
(Tweets) *Brain Twitter Conference (brainTC)*, 2017

Arithmetic computing via rate coding in neural circuits with spike-triggered adaptive synapses
(Poster) *International Joint Conference on Neural Networks (IJCNN)*, Killarney, 2015

Attended Workshops

IBRO-SIMONS Computational Neuroscience Imbizo (ISi-CNI) *January 2017*
Cape Town, South Africa
Project: Assessing the role of feature attention in object detection with CNNs.

Computational Approaches to Memory and Plasticity (CAMP) *June 2015*
Bangalore, India
Project: The role of the billions of granule cells in the cerebellum.

Other Achievements

- Recipient of the **Merit Award** (2017), awarded to students who achieve remarkable results at the end of their Degree, by the University of Trento, Italy.
- **Abstract Award Winner** at the Rovereto Workshop on Concepts, Actions and Objects (2017).
- Ranked **721 among 450,000 students** in the Joint Entrance Examination **(JEE, 2011)** conducted towards admission to the Indian Institute of Technology.
- Recipient of the **KVPY scholarship** (2009), awarded to **215 promising young researchers** throughout India, by the Dept. of Science & Technology, Govt. of India.
- **Winner** at the **Annual All India Web-Design Contest** (2008) hosted by SJIIT, Pune (India).
- Recipient of the **NTSE scholarship** (2007), awarded to **1000 students** throughout India with **excellent all-round skills**, by the National Centre for Educational Research and Technology, Govt. of India.

Technical Skills

Programming: Python (TensorFlow), MATLAB (PsychToolbox, MatConvNet, SPM)

Web-Design: HTML5, CSS3, JavaScript

Neuro-Imaging: EEG, fMRI

Other Notable Work

The functional relevance of neuronal clustering (*report*) *2016*

Understanding human visual processing with deep neural networks (*pres.*) *2016*

Predisposition to towards-gravity periodic motion in chicks (*report*) *2015*

Gesture Lock (*report*) *2013*

Work Experience

General Secretary *2014-15*
Undergraduate division - Department of Physics, IIT Bombay

Content Developer *Summer 2013*
Avanti Fellows, Delhi

Other Activities

- Co-founded **Neuro Mondays** in 2015, a weekly meeting at CIMeC, where students discuss a review, a specific paper, or their work about cutting-edge ideas in neuroscience and psychology.
- Maintain a blog, **Meadows**, of my writings.