Aditya UPADHYAYULA

Cognitive Scientist, Computer Engineer & Physicist

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Baltimore, MD International student on F-1 visa

Graduate student working towards understanding the functionality of human and machine intelligence systems using computational tools, algorithms, and cognitive science. Experienced with Python, Matlab, R, javascript, graph theory and big data analyses. Looking for summer internships.

EDUCATION

August 2016 – Present
Johns Hopkins University, BALTIMORE, MD
PhD. Psychological & Brain Sciences
Probabilistic models of Visual Cortex | Bayesian Statistics | Computational Psycholinguistics | Deep Learning Seminar | Deep Learning | Vision Seminar | Research seminar on Computational Cognitive Science

August 2016 – May 2018
Johns Hopkins University, BALTIMORE, MD
M.A. Psychological & Brain Sciences
Advanced Statistical Methods | Fundamentals of Cognitive Psychology | Fundamentals of Neuroscience | Advanced Seminar in Human Vision

January 2015 – May 2016
North Carolina State University, RALEIGH, NC
M.S. Electrical & Computer Engineering | GPA : 3.75/4
Biomedical Signal Processing | Detection & Estimation | Computer Vision | Advanced Biomedical Imaging | Neural Interfacing | Probabilistic Graphical Models | Medical Instrumentation | Pattern Recognition & Machine Learning

August 2008 – May 2013
Birla Institute of Technology & Science, PILANI, India
M.Sc. Physics
B.E. (Hons) Electronics & Communications Engineering | GPA : 7.54/10
Quantum Mechanics | Particle Physics | Statistical Mechanics | Mathematical Methods in Physics | Digital Image Processing | Analog & Digital Electronics | VLSI Design

RECENT RESEARCH EXPERIENCE

August 2016 – Present
Graduate Student, JOHNS HOPKINS UNIVERSITY, Baltimore, MD
Visual Thinking Lab | Advisor : Dr. Jonathan Flombaum

- Currently investigating the performance limitations of human cognition and the structure & format of the underlying mental representations of human cognition.
- Developed the analysis pipeline and setup the Eyelink 1000 plus eye tracker to be used in various cognitive neuroscience experiments.

Python | Matlab | R | Eyetracking | Javascript | html | css | Pytorch | Tensorflow

August 2015 – May 2016
Graduate Student, NORTH CAROLINA STATE UNIVERSITY, Raleigh, NC
Advisor : Dr. David S. Lalush

- Master's Thesis
- Developed image processing algorithms to remove angular sampling respiratory artifacts in self gated sequential MRI

Matlab | DICOM

January 2016 – May 2016
Graduate Research Assistant, UNIVERSITY OF NORTH CAROLINA , Chapel Hill, NC
Advisor : Dr. Flavio Frohlich

- Developed a pipeline to analyze resting state EEG data for patients with Major Depressive Disorder.

Matlab | EEGLAB

Recent Projects

Hierarchical structure in processing visual narratives August 2019 - Present

This project uses computational methods to investigate if our ability to process visual narratives is similar to the way we speak written languages. In the grand scheme of things, it provides insights into how humans are able to think, speak and communicate unlike other animal species

Python | Svgling | Earley Parser | Hidden Markov Models | NLTK | PyTorch

Distortions of Temporal processing August 2018 - Present

Unlike spatial processing, we do not have dedicated neural systems for processing time. Yet, we are able to have a sense of time. This project aims to investigate how we represent time in mind, and what kind of cognitive distortions affect the way we process time

Python | MATLAB | Psychopy | Psychophysics | Spatio-temporal processing | Rapid Serial Visual Presentation | Plotly

Understanding the limitations of human cognition August 2016 - January 2019

Our ability to attend to and remember multiple things in parallel is limited when compared to machines. What are the underlying mechanisms responsible for this behavior? Moreover, why are some individuals better than the others in multi-tasking? I used a Multiple Object Tracking paradigm combined with eye tracking and computational modelling to investigate this question

Python | MATLAB | Kalman Filters | LSTM | Eye Tracking | Psychopy | Psychtoolbox | Plotly

Publications (Manuscripts in prep & Under review)

2020 **Upadhyayula S.A.**., & Flombaum. J.I. (*Under Review*). A Model that Adopts Human Fixations Explains Individual Differences in Multiple Object Tracking

2020 **Upadhyayula S.A.**., Ian B. Phillips & Flombaum. J.I. (*In prep*). Space and Time Dissociate in the construction of a Visual Moment

2020 **Upadhyayula S.A.**., Ian B. Phillips & Flombaum. J.I. (*In prep*). Subjective Expansion of Time happens in our immediate memory, but not perceptual experience

Talks & Posters

2020 **Aditya Upadhyayula**, Ian Phillips & Flombaum. J.I. Space and Time Dissociate in the construction of the Visual Now, talk presented at V-VSS 2020

2020 Ian Phillips, **Aditya Upadhyayula** & Flombaum. J.I. Tachyspychia - subjective expansion of time - happens in immediate memory, and not in perceptual experience, poster presented at V-VSS 2020

2019 **Upadhyayula, Shanmukha**, and Jonathan Flombaum, "Distortions of time perception", presented at Mid Atlantic Memory and Attention conference

2019 **Upadhyayula, Shanmukha**, and Jonathan Flombaum, Two distortions of perceived space and time, presented at Object Perception Attention & Memory (OPAM)

2019 **Upadhyayula, Shanmukha**, and Jonathan Flombaum, The Visual Now across the visual field, presented at Captial Area Cognition Action & Perception

2018 **Upadhyayula, Shanmukha**, and Jonathan Flombaum, "Object size affects multiple object tracking performance (but not via frequency of close encounters)." Journal of Vision 18.10 (2018) : 1020-1020.

Skills

Programming	**Python MATLAB**, **R**, **C**, Javascript, HTML, Java
Operating Systems	MacOs, Linux, Windows
Software	**PyTorch**, **Psychopy**, **Psychtoolbox**, **Plotly**, Tensorflow, Eyelink 1000 plus, EEGLAB

Honors and Awards

2019 Travel Award, Object Perception Attention and Memory conference

2019 Departmental Collaborative Research Grant Award | Topic : Individual differences in temporal integration of music

2016 – present Robert S. Waldrop Graduate Student Fellowship

Teaching

Spring 2020	Instructor - Cognitive Neuroscience, Johns Hopkins University
Fall 2019	Teaching Assistant - Research Methods, Johns Hopkins University
Spring 2019	Teaching Assistant - Design & Experimental Analysis, Johns Hopkins University
Fall 2018	Teaching Assistant - Sensation & Perception, Johns Hopkins University
Spring 2018	Teaching Assistant - Introduction to Cognitive Psychology, Johns Hopkins University
Fall 2017	Teaching Assistant - Introduction to Psychology, Johns Hopkins University