Madhavun Candadai Vasu

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Website - http://mcandadai.com GitHub – https://github.com/madvn

EDUCATION

Indiana University, Bloomington – GPA 4.0/4.0 August 2015 – present
Doctoral Candidate, Ph.D. in Cognitive Science, minor in Computer Science

University of Cincinnati – GPA 3.98/4.0 March 2015
Master of Science, Electrical and Electronics Engineering

Amrita School of Engineering, India – GPA 8.16/10.0 March 2011
Bachelor of Technology, Electronics and Communication Engineering

JOURNAL AND PEER-REVIEWED CONFERENCE PROCEEDINGS

1. Candadai, M., Setzler, M., Izquierdo, E. J., & Froese, T. (2019). Embodied dyadic interaction increases complexity of neural dynamics: A minimal agent-based simulation model. Frontiers in Psychology, 10.
2. Candadai, M., & Izquierdo, E. J. (2018, May) Multifunctionality in embodied agents: Three levels of neural reuse. 40th Cognitive Science Conference. (Oral presentation)
3. Vasu, M. C., & Izquierdo, E. J. (2017, September). Information Bottleneck in Control Tasks with Recurrent Spiking Neural Networks. In International Conference on Artificial Neural Networks (ICANN) (pp. 236-244). Springer, Cham. (Oral presentation)
4. Vasu, M. C., & Izquierdo, E. J. (2017, July). Evolution and analysis of embodied spiking neural networks reveals task-specific clusters of effective networks. In Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) (pp. 75-82). ACM. (Oral presentation)

   Nominated for Best Student Paper, 2017 by International Society of Artificial Life – Student chapter.
5. Candadai, M., Vanarase, A., Mei, M., & Minai, A. A. (2015, July). ANSWER: An unsupervised attractor network method for detecting salient words in text corpora. In Neural Networks (IJCNN), 2015 International Joint Conference on (pp. 1-8). IEEE.

POSTERS

6. Dwiel, Z., Candadai, M., Phielipp, M., Bansal, A. (2019, May) Hierarchical Policy Learning is sensitive to goal space design. Task-Agnostic Reinforcement Learning workshop, International Conference on Learning Representations (ICLR).
7. Vasu, M. C., & Izquierdo, E. J. (2018, March) Multifunctionality Can Emerge from Brain-Body-Environment Interaction: An Information Theoretic and Dynamical Systems Theoretic Account. Greater Indiana, Society for Neuroscience Meeting.
8. Candadai, M. & Izquierdo, E. J. (2019, March) On the Role of Predictive Coding in Adaptive Behavior. Greater Indiana, Society for Neuroscience Meeting.

Talks

1. Candadai, M., & Izquierdo, E. J. (2019, May) Disentangling sources of predictive coding in embodied agents. Midwestern Cognitive Science Conference, Cognitive Science Society.
2. Candadai, M., & Izquierdo, E. J. (2018, April) Information theoretic exploration of the neural basis of behavior. Intelligent and Interactive Systems Seminar, School of Informatics, Computing and Engineering, Indiana University, Bloomington.
3. Candadai, M., & Izquierdo, E. J. (2018, May) Three levels of neural reuse in multifunctional neural networks. Midwestern Cognitive Science Conference, Cognitive Science Society.

Experience

Intel AI Lab – Intern — Summer 2018

- Research project on learning informative disentangled representations for deep reinforcement learning
- Contributed to research project on unsupervised learning of goal spaces
- Contributed to the team that participated in the WUR Autonomous Greenhouse Challenge

Cincinnati Children's Hospital Medical Center – Student Researcher — Aug 2014 – Mar 2015

- Constructing structural brain networks from DTI data – FSL, Diffusion Toolkit
- Simulating spatiotemporal dynamics and construct functional brain networks
- Modeling developmental changes in the functional network to construct age appropriate human brain atlases.

International Business Machines (IBM) – Associate System Engineer — July 2011 – July 2012

- Responsibilities included design and development of a Web Portal for a leading French Insurance provider.
- Application developed using - HTML/JSP for front end, Java for business layer and Web Services over SOAP.

Teaching

Instructor

- Q260: Programming for the Cognitive and Information Sciences – Python — Spring 2018
- Q320: Computation in the Cognitive and Information Sciences — Spring 2018

Associate Instructor/Teaching Assistant

- Q355: Neural networks and the brain — Spring 2019
- Q350: Math and Logic for Cognitive Science — Fall 2016, Fall 2017

Funding

- Supplemental Research Fellowship, Indiana University — 2017 & 2018
- ACM Graduate student travel grant to present at GECCO'17 — 2017
- Graduate Fellowship, Indiana University — 2015 - 16
- University Graduate Scholarship, University of Cincinnati — 2013 - 14
- University Graduate Scholarship, University of Cincinnati — 2012 - 13
- Merit based scholarship for higher education, Tata Welfare Trust — 2013

Awards

- Co-advised undergraduate to win the Wells-Fargo data analytics challenge — 2018
- Outstanding Graduate Teaching Award — 2017 - 2018
- Co -advised undergraduate student - people's choice poster award, SICE spring symposium — 2018
- RevolutionUC Hackathon – 2nd place – Quick Pick: intelligent restaurant recommendations — 2014
- Finisher, Cincinnati Flying Pig Marathon — 2014

Open-Source Software

Infotheory - http://mcandadai.com/infotheory/

- Python/C++ software created in collaboration with Dr. Eduardo Izquierdo, for information theoretic analysis of multivariate data
- Uses sparse data structures, and average shifted-histograms for scalable and efficient estimations

StochSearch - http://github.com/madvn/stochsearch

- Python package created in collaboration with Dr. Eduardo Izquierdo, that implements multiple stochastic search algorithms using the MPI parallel computing framework

CTRNN - https://github.com/madvn/CTRNN

- Python package to build and simulate continuous time recurrent neural networks

Turing Machine Simulator - http://mcandadai.com/q350/tm_sim_tuple.html

- A JavaScript implementation to build and simulate Turing machines and finite-state machines using tuple-based representations.

References

Dr. Eduardo J. Izquierdo (Ph.D. advisor) – edizquie@indiana.edu
Dr. John M. Beggs (Ph.D. committee member) – jmbeggs@indiana.edu