Sankaran 'Shifu' Vaidyanathan

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Education

Sep '19–Jun '21 *(expected)* **M.S., Computer Science**, *University of Massachusetts Amherst* **GPA**: 4.0/4.0
Courses: Machine Learning, Research Methods in Empirical CS, Quantum Information Systems, Probabilistic Graphical Models, Artificial Intelligence, Reinforcement Learning, Causal Inference

Aug '13–Jun '17 **B.E., Electrical and Electronics Engineering**, *SSN College of Engineering, Anna University*
Thesis Project: *Control of Autonomous Quadrotor for Real-Time Object Tracking*
Built an APM2.6 based quadcopter that tracked and followed objects selected from a PC interface. Implemented Lucas-Kanade optical flow for tracking, and Kalman filter based video stabilization.

Technical Skills

- **Programming Languages**: Python, C++
- **Frameworks**: PyTorch, TensorFlow, sklearn, numpy, OpenCV, Processing
- **Tools and Platforms**: Linux, Kubernetes, LaTeX, Git, Jupyter, Arduino

Experience

Jan '20–present **Graduate Research Assistant**, *Knowledge Discovery Lab, UMass Amherst*
- As part of the DARPA CAML (Competence Aware Machine Learning) program, using causal inference methods to predict the competence of an ML-based robot perception system and identify the conditions that cause its competence, given a high-level description of its environment
- Developing disentangled representation learning methods that enable causal modeling with independent components, to allow for an end-user to specify interventions that are actionable.

Jan–May '19 **Teaching Assistant, Machine Learning**, *Certification in Technology and Management, IIT Madras and IIM Bangalore*
- Developed iPython-based interactive demos and gave supplementary video lectures based on these, designed exams and programming assignments, and led in-person discussion sessions.

Jul '17–Jun '19 **Project Associate**, *IIT Madras - Robert Bosch Centre for Data Science and Artificial Intelligence*
- As part of a project on Network Representation Learning (NRL) with Intel, developed hypergraph clustering methods for bibliographic and social network data by extending the modularity maximization framework.
- Developed a method for improving clustering quality by iteratively balancing hyperedge cuts.
- On the side, set up a Kubernetes-based GPU cluster for the lab (50 GPUs and 70+ users at the time) and served as a system administrator.

Publications

Applied Network Science '20 **Hypergraph Clustering by Iteratively Reweighted Modularity Maximization**
Tarun Kumar, **Sankaran Vaidyanathan**, Harini Ananthapadmanabhan, Srinivasan Parthasarathy, Balaraman Ravindran

Complex Networks '19 **A New Measure of Modularity in Hypergraphs: Theoretical Insights and Implications for Effective Clustering**
Tarun Kumar*, **Sankaran Vaidyanathan***, Harini Ananthapadmanabhan, Srinivasan Parthasarathy, Balaraman Ravindran *(* denotes equal contribution)*

Extracurricular Activities

- Co-organizer for the **Machine Learning and Friends Lunch** at UMass, a weekly series of talks
- Organized a workshop for UMass CS graduate students on **responding to microaggressions**
- **Playwriting**: Produced an original 90-minute show (*Minutes Before Midnight*) and multiple 10-minute plays at Chennai theater festivals, and audited Playwriting classes at UMass.