

Videsh Suman

☎ (+1) (413) 409-1993 | ✉ vsuman@cs.umass.edu | 💻 sumanvid97 | 🌐 sumanvid97.github.io | 📷 sumanvid97

Interests: Deep Learning, Computer Vision, NLP, Graphical Models, Reinforcement Learning

Education

University of Massachusetts (UMass) Amherst

Sep '19 - May '21 (Expected)

M.S. IN COMPUTER SCIENCE (GPA: 3.97/4.00)

- Relevant Courses: Graphical Models, Computer Vision, Optimization, Advanced NLP, Data Science Algorithms, 3D Vision (spr '21)

Indian Institute of Technology (IIT) Bombay

Aug '15 - May '19

B. TECH. IN ENGINEERING

- Relevant Courses: Machine Learning I & II, Deep Learning, Reinforcement Learning, Medical Image Computing, Algorithm Design

Research & Work Experience

Risk-Aware Traffic Interaction Modeling for Autonomous Driving | University of Maryland

June '20 - Present

RESEARCH INTERNSHIP UNDER PROF. ANIKET BERA, GAMMA LAB

- Proposed a risk-aware driving framework for recognizing high-level tactical decisions to understand human driving behavior
- Leveraged graph convolutions for spatio-temporal message-passing to learn intentions and interactions amongst road users
- Achieved overall mAP scores of 47.7% and 49.8% on goal-oriented action and cause benchmarks of Honda Driving Dataset
- Evaluating robustness of this driving framework on the task of causal risk identification in a weakly-supervised manner

Data Informed Network Simulation | Microsoft Research India

May '19 - Jul '19

RESEARCH INTERNSHIP UNDER DR. SUNDARARAJAN S., DR. NAGARAJAN N. & DR. VENKAT PADMANABHAN

- Hypothesized a novel data-driven network simulator to learn the behaviour of network traces from ns-2 and real Skype calls
- Created probabilistic and LSTM-based state space forecasting models to estimate network sequences from the target distribution
- Achieved high distribution similarity for propagation delays and packet loss rates on inference runs of state-transition models
- Formulated a confidence score for any test inference based on log-likelihood of input traces from training distribution

Deep Super-Resolution of Rainfall Projections for Indian Landmass

Sep '18 - Apr '18

UNDERGRADUATE THESIS UNDER PROF. AMIT SETHI & PROF. SUBIMAL GHOSH

- Leveraged deep super-resolution to predict regional rainfall projections in 10x spatial resolution, from 9 climate parameters
- Designed an encoder-decoder CNN with dense blocks for learning parameters shared across seven zones of Indian landmass
- Improved state-of-the-art by achieving overall MSE of 5 mm/day rainfall by training on daily climate data of past 38 years

Intelligent Virtual Conversational Platform | Disney India

May '18 - Jul '18

INTERNSHIP IN CONSUMER TECHNOLOGIES UNDER MR. AFTAB SHEIKH

- Designed conversations, and trained the agents for conversational assistance with effective intent & context recognition
- Integrated the data with entities, and deployed them for fulfilled responses on tasks like voice search and Helpdesk assistance

Research Implementations

Discriminative Adversarial Search for Text Summarization [report] [code]

Oct '20 - Dec '20

ADVANCED NLP UNDER PROF. MOHIT IYER

- Demonstrated the effectiveness of discriminative adversarial beam reranking for text summarization on CNN DailyMail dataset
- Implemented reranking with UniLM based on the human-ness of generated sequences predicted by a trained discriminator

Semi-Supervised Learning for Vision and Language Tasks [report] [code]

Oct '19 - Dec '19

COMPUTER VISION UNDER PROF. SUBHRANSU MAJI

- Investigated the direction of SSL via self-training, mixup regularization and MixMatch algorithms for NLVR2 dataset using LXMERT
- Concluded the limitation of this paradigm for a hard multimodal task through extensive experimentation

Super-resolution using Adversarial Learning [report] [code]

Oct '18 - Nov '18

DEEP LEARNING UNDER PROF. P. BALAMURUGAN

- Implemented GAN for single image super-resolution using ResNet based generator and discriminator networks
- Achieved photo-realistic 4x super-resolution by training on Pascal VOC2012 using a perceptual loss based minimax objective

Progressive Networks for Multitask Reinforcement Learning [report] [code]

Oct '18 - Nov '18

REINFORCEMENT LEARNING UNDER PROF. SHIVARAM KALYANAKRISHNAN

- Explored knowledge transfer between 2 Atari environments by introducing frozen lateral connections to the actor-critic framework

Flappy Bird AI [blog] [code]

Mar '18 - Apr '18

MACHINE LEARNING UNDER PROF. AMIT SETHI

- Trained and compared two agents for the game using vanilla Q-learning and Deep Q-Network, both achieving superhuman results

Miscellaneous

- **Programming Tools:** Python, C++, MATLAB, R, Bash, SQL, Git, \LaTeX , Java
- **Machine Learning Tools:** PyTorch, Tensorflow, Keras, OpenCV, scikit-learn, pandas
- **Conferences Attended:** NeurIPS 2020, IROS 2020
- **Scholastic Achievements:** KVPY Fellowship (2015) from IISc Bangalore; national rank of 1490/140k in JEE Advanced (2015)
- **Extra-curricular Activities:** Volunteer at MLFL-UMass, former convener of the web and coding club (WnCC-IITB); former coordinator in marketing and technical teams of Mood Indigo; fine arts and music enthusiast