Nidhin Harilal

Senior Undergraduate
Discipline of Computer Science and Engineering
Indian Institute of Technology, Gandhinagar, India

Email: nidhin.harilal@iitgn.ac.in
Web: cryptonymous9.github.io
Phone: +91 9466283066

EDUCATION

Indian Institute of Technology, Gandhinagar *August 2017 - Present*
B.Tech. (with Honours) in Computer Science and Engineering Overall GPA: 8.63/10
· *Degree of **Honors** denotes 20 additional CS course credits*

PUBLICATIONS

[Re] SDE-Net: Equipping Deep Neural Networks with Uncertainty Estimates
Nidhin Harilal*, Rohan Patil*
Manuscript in preparation for ML Reproducibility Challenge **(RC2020)**

Deep HDR Video Reconstruction from LDR Sequences with Alternating Exposures
Chandan Kumar*, Nidhin Harilal*, Mrinal Anand*, Shanmuganathan Raman
Submitted to IEEE International Conference on Computational Photography **(ICCP'21)**

Augmented Convolutional LSTMs for Generation of High-Resolution Climate Change Projections
Nidhin Harilal, Udit Bhatia, Mayank Singh
Under revision in IEEE Access Journal, Arxiv pre-print [**PDF**]

CARO: An Empathetic Chatbot for People with Major Depression
Nidhin Harilal, Rushil Shah, Saumitra Sharma, Vedanta Bhutani
Young Researchers' Symposium, ACM Joint International Conference on Data Science and Management of Data, **(CoDS-COMAD)** 2020 [**PDF**]

* indicates equal contribution

INTERNSHIPS

Northeastern University, Boston July 2020 - Present
(Remote) Summer Research Intern *Advisor: Prof. Auroop R. Ganguly*

Indian Institute of Technology, Gandhinagar May - July 2019
Summer Research Intern *Advisor: Prof. Udit Bhatia*

Capgemini Technology Services Pvt. Ltd., Ahmedabad April - June 2019
Machine Learning Intern

SUPERVISED RESEARCH PROJECTS

Investigating Occam's Razor on Neural Networks with Uncertainties July 2020 - Present
Advisor: Prof. Auroop R. Ganguly, Northeastern University *Manuscript in preparation*
· Analysed performance vs complexity trade-offs of Monte-Carlo (MC) dropout Bayesian neural networks on varying depth, width and ensembles with a focus on noisy polynomials with varying degrees.
· Devised a loss-landscapes based approach for utilizing multiple configurations at once to study optimality in terms of model performance and efficiency in extracting signals from different noisy samples.

HDR video reconstrution from LDR sequences with alternating exposures May - Sept'20
Advisor: Prof. Shanmuganathan Raman, IIT Gandhinagar *Under Review, ICCP'21*
· Developed a Generative Adversarial Network (GAN) based framework for reconstructing High Dynamic Range (HDR) videos from Low Dynamic Range (LDR) frames with alternating exposures.
· Framework consisted of a self-supervised sub-network for noise correction and an optical-flow module to optically align consecutive sequence and produce temporally consistent video frames.

Deep Learning based Statistical Downscaling for Climate Projections May - Oct 2019
Advisor: Prof. Udit Bhatia, IIT Gandhinagar *Under Revision, IEEE Access Journal*

- Statistical downscaling involves generating high-resolution projections from Earth System Models (ESM) which are run at spatial resolutions too coarse for assessing the localized effects.
- Critiqued & found several problems including Concept Drift with current machine learning approaches in statistical downscaling. Utilized additional set of covariates along with ESM outputs and proposed a Conv-LSTM based recurrent structure considering both spatial & temporal domains for downscaling.

OTHER KEY PROJECTS

Fast and Approximate Network analysis using Graph Neural Networks June - July 2020
Prof. Anirban Dasgupta, Course: Introduction to Data Science

- Worked on finding the effectiveness of Graph Neural Networks (GNNs) on approximating various network centrality measures including degree, closeness and betweeness centrality. Implemented and tested GNNs on synthetically generated networks dataset including ER, BA and Gaussian partition graphs.

CARO: An Empathetic Chatbot for People with Major Depression Sept - Nov 2019
Prof. Mayank Singh, Course: Natural Language Processing *Presented at CoDS-COMAD'20*

- CARO is an attempt to tackle problems of the generalized health or monotonic responses associated with the current health/ counselling chatbots. Designed a transformer based empathetic response and a medical advice generation framework leading to a medical counselling based implementation.

TEACHING EXPERIENCE

Teaching Assistant Nov 2020 - Present
Courses: ES-102 (Introduction to Computing)

Mentor, Academic Discussion Hours (Weekly doubt clearance) Aug 2018 - April 2019
Courses: ES-102 (Introduction to Computing) & ES-112 (Computing)

TECHNICAL KNOWLEDGE

ML Frameworks	PyTorch, Keras, Tensorlflow
Programming Languages	Python, C, MATLAB, Javascript, HTML
Others	Flask, Django, NodeJS, Git, Arduino, LaTeX

HONORS AND AWARDS

- Reviewer, Winter Conference on Applications of Computer Vision (WACV'21). October 2020
- Awarded Travel Grant to attend CoDS-COMAD'20, Hyderabad, India January 2020
- Secured a position in Dean's List for excellent academic performance. 2018, '19
- Runner-up in BBC Fighting Fake News Hackathon at Google, Gurugram January 2019
- Selected for Coding Hackathon at annual Inter-IIT Tech meet, IIT Bombay December 2018
- Ranked in top 0.01 percentile in JEE Advanced examination 2017. June 2017
- Ranked in top 0.003 percentile in JEE Mains examination 2017. April 2017
- National Winner of CBSE All India Annual Science Exhibition, New Delhi. December 2014

KEY COURSES UNDERTAKEN

Computer Science	Advanced Machine Learning*, Data Science, 3D Computer Vision Introduction to Machine Learning , Natural Language Processing
Mathematics	Probability & Random Processes*, Statistics & Numerical Methods, Complex Analysis, Calculus, Linear Algebra & Differential Equations
Others	Computational Physics*, Nature Inspired Computing*, Networks & Complex Systems, Digital Image Processing

* to be completed by Dec '20