Nidhin Harilal

Doctoral Student
Department of Computer Science
University of Colorado, Boulder, CO, USA

Email: nidhin.harilal@colorado.edu
Web: cryptonymous9.github.io

EDUCATION

University of Colorado, Boulder — *August'21 - Present*
Ph.D. in Computer Science — GPA: 4.0/4.0

Indian Institute of Technology, Gandhinagar — *August'17 - May'21*
B.Tech. (with Honours) in Computer Science and Engineering — GPA: 8.51/10
· *Degree of **Honors** denotes 20 additional CS course credits*

PUBLICATIONS

Bayesian Deep Learning Hyperparameter Search for Robust Function Mapping to Polynomials with Noise
Nidhin Harilal, Udit Bhatia, Auroop Ganguly
Manuscript in preparation [**Arxiv pre-print**]

Deep HDR Video Reconstruction from LDR Sequences with Alternating Exposures
Chandan Kumar*, Nidhin Harilal*, Mrinal Anand*, Shanmuganathan Raman
Accepted in Indian Conference on Computer Vision, Graphics and Image Processing **(ICVGIP'21)**

Augmented Convolutional LSTMs for Generation of High-Resolution Climate Change Projections
Nidhin Harilal, Mayank Singh, Udit Bhatia
IEEE Access, Volume 9 (2021) [**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

HONORS AND AWARDS

· Recepient of Awtar and Teji Singh Graduate Fellowship 2021 ($20,000) — September 2021
· Received cash award ($350) for Active Research & Journal Publication by IIT GN. — May 2021
· 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
· 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

INTERNSHIPS

Northeastern University, Boston — July 2020 - Dec 2020
(Remote) 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 *Accepted, ICVGIP'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 *IEEE Access, Vol. 9*

- 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

University of Colorado, Boulder 2021 - 22
Teaching Assistant, Department of Computer Science
- *CSCI 4460: Machine Learning, Fall 2021*

Indian Institute of Technology, Gandhinagar 2020 - 21
Teaching Assistant, Department of Computer Science & Engineering
- *ES 654: Machine Learning, Spring 2020*
- *ES 102: Introduction to Computing, Fall 2020*

TECHNICAL KNOWLEDGE

ML Frameworks	PyTorch, Keras, Tensorflow
Programming Languages	Python, C, MATLAB, Javascript, HTML
Dev Frameworks	Flask, Django, NodeJS, Git