

# Nidhin Harilal

Doctoral Student  
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## EDUCATION

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**University of Colorado, Boulder**  
PhD in Computer Science

*August'21 - Present*

**Indian Institute of Technology, Gandhinagar**  
B.Tech. (with Honours) in Computer Science and Engineering  
· Degree of *Honors* denotes 20 additional CS course credits

*August'17 - May'21*  
Overall GPA: 8.51/10

## PUBLICATIONS

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**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

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|--|----------------|
| · Recipient 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

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**Northeastern University, Boston**  
(Remote) Research Intern

July 2020 - Dec 2020  
Advisor: [Prof. Auroop R. Ganguly](#)

**Indian Institute of Technology, Gandhinagar**  
Summer Research Intern

May - July 2019  
Advisor: [Prof. Udit Bhatia](#)

## SUPERVISED RESEARCH PROJECTS

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**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 reconstruction 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

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**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 betweenness 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

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**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

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