

# YADHU MANOJ KARTHA

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## Education

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### Georgia Institute of Technology — College of Computing

Atlanta, GA

PhD in Machine Learning 3.5/4.0

Aug 2022 — May 2026

- **Courses:** Machine Learning, Deep Learning, Image Processing, Computer Vision, Diffusion Models & Generative AI

### Indian Institute of Technology

India

Bachelors of Mechanical Engineering 3,0/4,0

Aug 2018 — May 2022

## Research Experience

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### Seismic Laboratory for Imaging and Modeling

Atlanta, GA

Graduate GenAI Researcher, Advised by Dr. Felix Herrmann

Aug 2022 – Present

- The SLIM Laboratory specializes in the application of machine learning techniques to areas including generative AI, image processing, and seismic imaging. As a member since the fall of 2022, I am now entering my second year of contributions to this cutting-edge research environment. My current focus is on the domain of generative AI, exploring methodologies such as Normalizing Flows, Diffusion Models, and Generative Adversarial Networks (GANs)
- In addition, my expertise extends to advanced computer vision techniques encompassing image and video processing, as well as Convolutional Neural Networks (CNNs). My ongoing project is centered around the application of style transfer through Conditional Generative Networks, targeting the manipulation of large-scale images, including earth models
- This work not only contributes to the advancement of AI and machine learning but also demonstrates the potential for innovative solutions in interpreting and processing complex visual data.

### Seismic Laboratory for Imaging and Modeling

Atlanta, GA

Machine Learning Research Intern

- Developed an artificial intelligence model capable of generating high-resolution images from lower-resolution inputs. These inputs consist of snapshots capturing wave propagation phenomena, which are inherently governed by complex physical principles and exhibit highly non-linear characteristics.
- Solution employs Convolutional Neural Networks (CNNs) that are trained to understand the physics and propagation dynamics of waves, with the aim of generating enhanced, time-propagated images

### Massachusetts Institute of Technology

Boston, MA

Machine Learning Research Intern

- Enhanced Physics-Informed Neural Networks (PINNs) efficiency through optimal sampling selection for solving Partial Differential Equations (PDEs).
- Contributed to DeepXDE, a library using neural networks for approximating PDE solutions, by integrating specific sampling methods.

## Publications

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### Rethinking Residual Point Sampling in PINNs

- Lu Lu, Yadhu M Kartha, Qinyang Yang. Rethinking Residual Point Sampling in PINNs. Journal of Computational Physics
- Paper: <https://arxiv.org/abs/2207.10289>

## Skills

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**Languages:** Julia, Python, JavaScript, C/C++, Java, Typescript, SQL, Dart, HTML, CSS, Swift

**Tooling:** MPI, Numpy, Scikit, TensorFlow, Keras, PyTorch, Pandas, ReactJS, Node.js, AWS, Docker, GCP, Firebase

**Interests:** Skateboarding, Gaming, Volleyball, Entrepreneurship, Hackathons, Chess, Arduino/Rpi

## Courses

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- Deep Learning
- Computer Vision
- Digital twins and Generative AI
- Medical Image Processing
- Diffusion Models