KRISHNANUNNI C G

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EDUCATION

The University of Texas at Austin, TX **January 2021 – Present**
Ph.D. in Aerospace Engineering & Engineering Mechanics (GPA: 3.81 / 4.0)

Indian Institute of Technology Madras, India **August 2017 – December 2019**
Master of Science in Structural Engineering (GPA: 9.41 / 10)

National Institute of Technology Calicut, India **August 2013 – August 2017**
Bachelor of Science in Civil Engineering (GPA: 9.15 / 10)

FELLOWSHIPS, SCHOLARSHIPS, and AWARDS

- Warren A. and Alice L. Meyer Endowed Scholarship in Engineering from the Cockrell School of Engineering, UT Austin. **June 2024**
- Travel Award by the United States Association for Computational Mechanics (USACM), Thematic Conference on Uncertainty Quantification for Machine Learning Integrated Physics Modeling, Virginia. **June 2024**
- Travel Award by the Society for Industrial and Applied Mathematics (SIAM), Annual Meeting of the SIAM Texas-Louisiana Section, Houston, USA. **November 2022**
- Best MS Thesis award, Indian Institute of Technology Madras. **August 2020**
- Best Major B. Tech project award, National Institute of Technology, Calicut, India. **August 2017**
- Summer research fellowship, Department of mathematics, IISc, Indian Academy of Sciences. **July 2015**

RECENT JOURNAL PUBLICATIONS

- C. G. Krishnanunni., Tan Bui-Thanh (2022). Layerwise sparsifying training and sequential learning strategy for neural architecture adaptation. (Link)
- Albert Orwa Akuno., L. Leticia Ramirez-Ramirez., Chahak Mehta., C. G. Krishnanunni., Tan Bui-Thanh., Jose Arturo Montoya (2022). Multi-patch epidemic models with partial mobility, residency, and demography. *Chaos, Solitons, & Fractals*. (Link)
- Jonathan Wittmer., C. G. Krishnanunni., Hai Van Nguyen., Tan Bui-Thanh (2023). On Unifying Randomized Methods for Inverse Problems. *Inverse Problems*. (Link)
- C. G. Krishnanunni., B. N. Rao., (2021). Indirect health monitoring of bridges using Tikhonov regularization scheme and signal averaging technique. *Structural Control and Health Monitoring*. (Link)

RECENT INVITED TALKS

- Layerwise sparsifying training and sequential learning strategy for neural architecture adaptation. *U. S. National Congress on Computational Mechanics*, New Mexico, July 23-27, 2023.
- A two-stage strategy for neural architecture adaptation. 5^{th} *Annual meeting of the SIAM Texas-Louisiana Section on Uncertainty Quantification*, Houston, November 4-6, 2022.

RESEARCH EXPERIENCE

Transformer-powered surrogate for solving inverse problems via joint modeling with forward process
Collaborator: Dr. Kowshik Thopalli, Dr. Yamen Mubarka, Dr. Vivek Narayanaswamy, Dr. Jayaraman J. Thiagarajan (Lawrence Livermore National Laboratory, USA)

- Designed a transformer architecture based generative model that transports samples from a prior distribution to samples from posterior parameter distribution conditioned on an input measurement.

Developing efficient algorithms for neural architecture adaptation
Collaborator: Dr. Tan Bui-Thanh (UT Austin, USA)

- Research in mathematical optimization and machine learning aimed at developing a mathematically principled way for automatically determining neural network architecture for a given data-set.

A new look at the Ensemble Kalman filter via duality
Collaborator: Dr. Tan Bui-Thanh (UT Austin, USA)

- Research aimed at the analysis of Ensemble Kalman filter for inverse problems in order to get insights into new convergence improvement strategies.

Mathematical epidemiology project
Collaborator: Dr. Tan Bui-Thanh (UT Austin, USA) & Leticia Ramirez-Ramirez (CIMAT, Mexico)

- Research aimed at developing an epidemic model that takes into account the effects of human mobility on the evolution of disease dynamics in a multi-population environment.

Indirect health monitoring strategy for bridges
Collaborator: Dr. B. N. Rao (IIT Madras, India)

- Research in the area of signal processing aimed at developing a framework for damage detection in bridges based on dynamic response of a passing vehicle where the vehicle acts as a moving sensor.

Solving an inverse eigen value problem in structural mechanics
Collaborator: Dr. Mohammed Ameen & Dr. A S. Sajith (NIT Calicut, India)

- Research aimed at developing a computationally fast and accurate optimization framework to detect and quantify structural damage based on vibrational characteristics.

MENTORSHIP

- Moncrief Summer Internship mentor
    - Mentored a summer intern on the work titled *Physics informed deep-learning approach enhanced by POD for forecasting solutions to time-dependent PDE.*
- SIAM-UT Mentorship program
    - Mentored a student on an applied math project related to the use of reinforcement learning for solving a combinatorial optimization problem (nonlinear dimension reduction).

PROFESSIONAL EXPERIENCE

Graduate Teaching/Research Assistant **January 2021 - Present**
Oden Institute of Computational Engineering & Sciences, UT Austin *Austin, TX*

- Research assistant to Prof. Tan Bui-Thanh, Institute of Computational Engineering and Sciences.
- Teaching assistant for courses: Analytical methods, Mathematical methods in Science and Engineering.

Graduate Research Assistant **January 2020 - December 2020**
Indian Institute of Technology Madras *Madras, India*

- Research assistant to Prof. B. N. Rao, Structural Engineering department, IIT Madras.

Graduate Teaching Assistant **August 2017 - December 2019**
Indian Institute of Technology Madras *Madras, India*

- Teaching assistant for courses: Structural optimization and Finite element analysis.

JOURNAL ROLES

Peer Reviewer, *Applied Ocean Research,* Elsevier.

SKILLS

Software: MATLAB®, LaTeX®, AutoCAD®, ORIGIN®, ANSYS ®

Programming Languages: C++, Java, Python

ML Library: TensorFlow, PyTorch

REFERENCES

- **Tan Bui-Thanh**
  Associate Professor,
  Leader of Pho-Ices group
  Department of Aerospace Engineering and Engineering Mechanics
  The Oden Institute for Computational Engineering and Sciences
  The University of Texas at Austin
  Austin, USA
  tanbui@ices.utexas.edu
- **Jayaraman J. Thiagarajan**
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- **B. Nageswara Rao**
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- **Phoolan Prasad**
  Professor emeritus
  Department of Mathematics
  Indian institute of Science Bangalore
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