AYYAPPAN UNNIKRISHNA PILLAI

Research Scholar (PMRF), School of Infrastructure, IIT Bhubaneswar

@ merclogyk@gmail.com, a22ce09004@iitbbs.ac.in   ☎ +91906130937/7306295658   ⚲ Date of birth: 03/02/1997, Kollam , Kerala

in https://www.linkedin.com/in/ayyappanua44265177/   % https://ayyappanu.github.io/PortfolioAyyappanU/

EDUCATION

Ph.D in Structural Engineering
Indian Institute of Technology, Bhubaneswar
🗓 2022 –   ⚲ Bhubaneswar , Odisha
- Semester grade: 9.59/10, Technical subject grade: 9.77/10

M.Tech in Structural Engineering
Indian Institute of Technology, Bhubaneswar
🗓 2020 – 2022   ⚲ Bhubaneswar , Odisha
- Grade: 9.44/10

B.Tech in Civil Engineering
TKM College of Engineering
🗓 2015 – 2019   ⚲ Kollam , Kerala
- Grade: 9.46/10, 7th rank in the University

Plus two in Science
Govt: Model HSS, Karunagappally
🗓 2013 – 2015   ⚲ Kollam , Kerala
- Grade: 98%

PROJECTS

Development of novel phase-field models for designing fracture and fatigue failure-resistant structural components
Ph.D, Indian Institute of Technology, Bhubaneswar
🗓 2022 -   ⚲ Bhubaneswar, Odisha

Novel continuum approaches for modeling material interfaces and brittle fracture
M.Tech, Indian Institute of Technology, Bhubaneswar
🗓 2021 - 2022   ⚲ Bhubaneswar, Odisha

Continuous flow electrocoagulation system for the treatment of coir industry wastewater
B.Tech, TKM College of Engineering, Kollam
🗓 2015 - 2019   ⚲ Kollam, Kerala

TEACHING ASSISTANT

- Solid Mechanics, Computational mechanics lab, Advanced Solid Mechanics, Finite element methods, Design of structures

TECHNICAL SKILLS

Julia
MATLAB
Mathematica
AutoCAD
Abaqus
ETABS
STAAD.Pro

ACADEMIC SEMINARS

- Attended ECCOMAS 2024, Portugal, and presented an article on fatigue failure under anisotropic crack propagation
- Prediction of compressive strength of concrete: machine learning approaches
- Non-destructive neural identification of the moisture content of saline ceramic bricks using Artificial Neural Networks.
- Predicting the strength properties of slurry infiltrated fibrous concrete (SIFCON) using Artificial neural network

CONFERENCE

1. A diffused material interface based analytical method for elastic analysis of composites with in-plane inhomogeneity (accepted)
8th International Congress on Computational Mechanics and Simulation

2. A phase-field model for fatigue failure of ceramic laminates under residual stress field (accepted)
9th International Congress on Computational Mechanics and Simulation

PUBLICATIONS

1. Pillai, A. U. and Mohammad Masiur Rahaman. A novel phase-field model for fatigue failure in functionally graded materials under thermo-mechanical loading, Composite Structures (First review completed)

2. Pillai, A. U., & Rahaman, M. M. (2025), A phase-field length scale insensitive micropolar fatigue model, Computer Methods in Applied Mechanics and Engineering, Volume 446, Part A, 2025, 118259.
🗓 https://doi.org/10.1016/j.cma.2025.118259

3. Pillai, A. U., & Rahaman, M. M. (2025), A phase-field length scale insensitive model for fatigue failure in brittle materials, International Journal of Fatigue, 196, 108875.
🗓 https://doi.org/10.1016/j.ijfatigue.2025.108875

4 Pillai, A. U., Behera, A. K., & Rahaman, M. M. (2024). A phase-field length scale insensitive mode-dependent fracture model for brittle failure. Engineering Fracture Mechanics, 309, 110385
🗓 https://doi.org/10.1016/j.engfracmech.2024.110385

5. Akash Kumar Behera, **Pillai, A. U.**, Aniruddha Das, and Mohammad Masiur Rahaman. A micropolar phase-field model for size-dependent electro-mechanical fracture. International Journal of Mechanical Sciences, page 109805, 2024. ISSN 0020-7403.
🗓 https://doi.org/10.1016/j.ijmecsci.2024.109805

6. Pillai, A. U., Behera, A. K., & Rahaman, M. M. (2023). Combined diffused material interface and hybrid phase-field model for brittle fracture in heterogeneous composites. Engineering Fracture Mechanics, 277, 108957
🗓 https://doi.org/10.1016/j.engfracmech.2022.108957

7. Behera, A. K., **Pillai, A. U.**, & Rahaman, M. M. (2023). A phase-field model for electro-mechanical fracture with an open-source implementation of it using Gridap in Julia. Mathematics and Mechanics of Solids, 28(8), 1877-1908.
🗓 https://doi.org/10.1177/10812865221133860