Anurag Bhattacharyya

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EDUCATION

- **Doctor of Philosophy in Aerospace Engineering** **Expected Fall 2021**
  University of Illinois at Urbana-Champaign
  Advisor: Professor Kai A. James
- **Master of Science in Aerospace Engineering** **May 2017**
  University of Illinois at Urbana-Champaign
- **Bachelor of Technology in Mechanical Engineering** **May 2014**
  National Institute of Technology, Durgapur, India

RESEARCH EXPERIENCE

- **University of Illinois at Urbana-Champaign** **2015-Present**
  Graduate Research Assistant
  Novel Solution Methods for Optimal 3D Spatial Packaging and Routing of Electro-Thermal Systems
  - Developing multi-physics based optimization algorithms for efficient packaging of electro-thermal systems through industrial collaboration with Ford Motors and Raytheon Technologies.

  Design & Fabrication of Multiscale & Multimaterial Morphing Shape Memory Polymer Structures
  - Implemented a novel transient sensitivity analysis & multimaterial topology optimization algorithm to design multiscale structures with SMP materials using high-performance computing (HPC) and 4D printing techniques.

  Design of Bi-stable Camber Morphing Airfoil
  - Conceptually designed and prototyped a novel airfoil camber morphing mechanism using a nonlinear material model through structural optimization.
- **National Institute of Technology, Durgapur, India** **2013-2014**
  Undergraduate Researcher
  - Implemented algorithms to simulate flow around smooth surfaces.
  - Investigated shock capturing methods and effects of artificial viscosity on pressure in flow fields.
- **European Organization for Nuclear Research (CERN)** **2013**
  Summer Research Intern
  Design and Analysis of Small Angle Absorber (SAA3) Support Structures
  - Implemented CAD models and simulated proposed design improvements under seismic loads for ALICE detector.
  - Investigated the material and structural characteristics of the Inner Tracking System (ITS) of ALICE detector assembly.

PROFESSIONAL EXPERIENCE

- **TATA Consultancy Services-Engineering & Industrial Services, Kolkata, India** **2015**
  Assistant System Engineer, New Product Development Division
  - Prepared bill of material, part & assembly drawings and inspection plans
- **Exide Industries Limited, India** **2014**
  Graduate Engineering Trainee
  - Implemented projects related to machine design and production parameter optimization
- **Suzuki Powertrain India Limited, Gurgaon, India** **2012-2013**
  Engineering Intern
  - Investigated measures to eliminate data mismatch on fuel rail sub-assembly line to increase throughput.

TEACHING AND MENTORING EXPERIENCE

- **University of Illinois at Urbana-Champaign** **Fall 2017-Spring 2018**

  Teaching Assistant, Finite Element Analysis
  - Aided in teaching a graduate level course consisting of over 80 students.
  - Conducted office hours, prepared homework rubrics and graded exams/assignments.

  Instructor, ABAQUS software
  - Prepared instructional materials and assignments & conducted in-class tutorials.
  - Mentored students on ABAQUS related course and research projects.

  Graduate Mentor, Undergraduate Research Opportunity Program (UROP)
  - Mentored 4 undergraduate researchers on additive manufacturing and experimental investigations related to active/smart materials.

JOURNAL PUBLICATIONS

- **Bhattacharyya, A**., James, K.A., (in press). Topology Optimization of Shape-Memory Polymer Structures with Programmable Morphology, *Structural and Multidisciplinary Optimization.*
- **Bhattacharyya, A**., Conlan-Smith, C. and James, K.A., 2019. Design of a bi-stable airfoil with tailored snap-through response using topology optimization. Computer-Aided Design, 108, pp.42-55.
- Conlan-Smith, C., **Bhattacharyya, A.** and James, K.A., 2018. Optimal design of compliant mechanisms using functionally graded materials. *Structural and Multidisciplinary Optimization*, *57*(1), pp.197-212.

CONFERENCE PUBLICATIONS

- **Bhattacharyya, A**., Conlan-Smith, C. and James, K.A., 2017. Topology Optimization of a Bi-Stable Airfoil Using Nonlinear Elasticity. In 18th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference.

CONFERENCE PRESENTATIONS (2/3)

- **Bhattacharyya A.,** James K. A. (2019, July). Time-Dependent Adjoint Sensitivity Analysis for Multi-Material Topology Optimization of Shape Memory Polymer (SMP) Structures, In Proceedings of the 15th U.S National Congress on Computational Mechanics, Austin, Texas, USA.
- **Bhattacharyya A.**, Anderson N., and James K. A. (2018, July). Design of Morphing Shape Memory Polymer Structures Via Topology Optimization, In Proceedings of the 13th World Congress of Computational Mechanics, New York, NY**.**

HONORS AND AWARDS

- Mavis Future Faculty Fellowship – UIUC **2020**
- Aerospace Engineering Department Travel Award **2019**
- USACM Travel Award for World Congress on Computational Mechanics (WCCM) **2018**
- Graduated with distinction and ranking 3rd in Mechanical Engineering at NIT Durgapur **2014**

POSITION OF RESPONSIBILITIES

- **University of Illinois at Urbana-Champaign** **2015-Present**

  Laboratory Manager, CDI LAB
  - 3D-printer maintenance and troubleshoot.
  - Managing third party vendors and intra-university departments for streamlined lab functioning.
- **National Institute of Technology, Durgapur, India** **2013-2014**

  Class Representative, Mechanical Engineering Department
  - Facilitated communications between faculty members and students.
  - Managed inter-department events and activities.

TECHNICAL SKILLS

- Programming languages and mathematical packages: C, C++ (MPI, OpenMP), Python, MATLAB
- Computer aided design/engineering: CATIA, SOLIDWORKS, UG-NX, ABAQUS, ANSYS