

# Bhaskar Vajipeyajula

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## Education

- **Doctor of Philosophy**, Mechanical Engineering  
*Texas A&M University* 2017 – 2021  
Advisors: Dr. Kumbakonam Rajagopal and Dr. Eyad Masad
  - **Master of Engineering**, Mechanical Engineering  
*Texas A&M University* 2014 – 2017  
Advisor: Dr. Robert Handler
  - **Bachelor of Technology**, Mechanical Engineering  
*GITAM University* 2009 – 2013  
Advisor: Dr. Y.V.S.N. Murthy

# Research Experience



# Funding Experience

- **Removable Support Structures for Powder Bed Fusion Metal Additive Manufacturing**  
PI: Dr. Wayne Hung Co-PI: Dr. Bhaskar Vajipeyajula Status: Funded Amount: \$78,000
  - **Understand and Characterizing support Structures for Powder Bed Fusion Metal Additive Manufacturing**  
PI: Dr. Wayne Hung Co-PI: Dr. Bhaskar Vajipeyajula Status: negotiation going on Amount: \$400,000

► **Experiment-Driven Certification Methods for Energetic Materials Made with Powder Material Extrusion**

Co-PI Dr. Bhaskar Vajipeyajula    Status: In preparation    Amount: \$600,000

## Teaching Experience

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► **Instructional Assistant Professor**

Engineering Technology and Industrial Distribution, Texas A&M University                          2021 – Present  
Courses: MMET 401 (Fluid Power Transmission), MMET 301 (Mechanical Power Transmission)  
MMET 281 (Manufacturing and Assembly Processes II), MMET 275 (Mechanics for Technologists),  
MMET 370 (Thermodynamics for Technologists)  
– Redesigned MMET 281, 301, and 401 to enhance student engagement and hands-on learning  
– Restructured course content and assessments to better align with program learning outcomes  
– Modernized mechanical and fluid power labs to support interactive demonstrations and experiments

► **Lecturer**

Department of Mechanical Engineering, Texas A&M University                          2017 – 2018  
Course: MEEN 404 (Engineering Laboratory)  
– Taught senior-level engineering design studio and mentored student teams in the development of custom experimental equipment  
– Supported students in identifying research topics, defining requirements, conducting experiments, and interpreting results

► **Graduate Teaching Assistant**

Engineering Technology and Industrial Distribution, Texas A&M University 2015 – 2016, 2020 – 2021  
Courses: MMET 301, 361, 401, 281  
– Delivered lecture and lab sessions on fluid and mechanical power transmission systems  
– Independently conducted CAD training (ProE, Inventor, SolidWorks) for 240+ students  
– Supervised and coordinated undergraduate TAs; co-developed lab manuals and instructional materials

► **Graduate Teaching Assistant**

Department of Mechanical Engineering, Texas A&M University                          2018 – 2019  
Course: MEEN 464 (Heat Transfer)  
– Led lab sessions for undergraduate heat transfer course, reinforcing core thermal principles through hands-on experimentation and problem-solving

## Journal Publications

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J1. P. Sreejith, A. E. Patterson, K. R. Rajagopal, and **B. Vajipeyajula**.

**Process-Induced Shrinking and Warping in Additively Manufactured Polycarbonate Plates**,  
*Applications in Engineering Science*, pp. 100220, 2025.

J2. J. Beltra Mira, V. Restrepo, **B. Vajipeyajula**, and A. E. Patterson.

**Effect of Specimen Size, Layout, and Bead Width on the Linear Elastic Fracture Toughness of FFF-Processed Polylactide**, *Engineering Fracture Mechanics*, vol. 315, pp. 110842, 2025.

J3. S. K. Selvaraj, A. L. Manoj, A. B. Mathew, A. V. Govind, G. Sundaramali, U. Chadha, **B. Vajipeyajula**, and A. E. Patterson.

**Parameter Optimization for Dissimilar Aluminum Alloys Joined Using Friction Stir Additive Manufacturing: A Screening Study**, *Engineering Reports*, vol. 7, pp. e13039, 2025.

J4. M. P. Dulanjana, B. Nathan, D. K. Dimuthu, **B. Vajipeyajula**, C. G. Kevin, and S. Isuru.

**Curve Parametric Modeling of Planar Soft Robots**, *IEEE*, pp. 299–304, 2024.

- J5. J. Beltra Mira, V. Restrepo, **B. Vajipeyajula**, and A. E. Patterson.  
**Impact of Compact Tension Specimen Size on Fracture Toughness of FFF Processed Thermoplastics**, *Procedia Structural Integrity*, Vol. 61, pp. 156–163, 2024.
- J6. **B. Vajipeyajula**, A. Narayan, E. Masad, and K. R. Rajagopal.  
**A Thermodynamic Viscoelastic Model to Capture the Effects of Confinement Pressure on Asphalt Mixtures**, *International Journal of Pavement Engineering*, Vol. 25, 2024.
- J7. **B. Vajipeyajula**, P. Murru, and K. R. Rajagopal.  
**Stress Concentration Due to an Elliptic Hole in a Porous Elastic Plate**, *Mathematics and Mechanics of Solids*, Vol. 28(3), pp. 854–869, 2023.
- J8. **B. Vajipeyajula**, P. Murru, and K. R. Rajagopal.  
**Stress Concentration Due to the Presence of a Rigid Elliptical Inclusion in Porous Elastic Solids Described by a New Class of Constitutive Relations**, *International Journal of Elasticity*, 2023.
- J9. **B. Vajipeyajula**, E. Masad, K. L. Roja, and K. R. Rajagopal.  
**Assessing Permanent Deformation of Reclaimed Asphalt Blended Binders Using Linear and Non-linear Viscoelasticity Theory**, *Materials and Structures*, Vol. 53, 2020.
- J10. K. L. Roja, **B. Vajipeyajula**, and E. Masad.  
**Chemical and Multi-scale Rheological Characterization of Recycled and Virgin Asphalt Binder**, *Construction and Building Materials*, Vol. 261, 2020.
- J11. **B. Vajipeyajula**, E. Masad, K. L. Roja, M. Sadeq, and K. R. Rajagopal.  
**Two-Constituent Nonlinear Viscoelastic Model for Asphalt Mixtures**, *Road Materials and Pavement Design*, July 2019.
- J12. **B. Vajipeyajula**, T. Krishna, and R. Handler.  
**Dynamics of a Single Buoyant Plume in FENE-P Fluid**, *Physics of Fluids*, Vol. 29, 2017.

## **Conference Publications & Presentations**

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- C1. S. Afolabi, E. Kabir, **B. Vajipeyajula**, and A. E. Patterson.  
**Designing Additively Manufactured Energetic Materials Based on Property/Process Relationships**, *Texas A&M Conference on Energy*, 2024.
- C2. A. E. Patterson and **B. Vajipeyajula**.  
**Designing Manufacturing Systems Under Energy Scarcity in Expeditionary Environments**, *Texas A&M Conference on Energy*, 2024.
- C3. G. Harmon, E. Kabir, **B. Vajipeyajula**, and A. E. Patterson.  
**Mapping Energy Consumption for Powder Material Extrusion Additive Manufacturing**, *Texas A&M Conference on Energy*, 2024.
- C4. J. Beltra Mira, V. Restrepo, **B. Vajipeyajula**, and A. E. Patterson.  
**Impact of Compact Tension Specimen Size on Fracture Toughness of FFF Processed Thermoplastics**, *IWPDF*, 2023.
- C5. A. E. Patterson, S. Hasanov, and **B. Vajipeyajula**.  
**Influence of Matrix Material on Impact Properties of Chopped Carbon Fiber-Thermoplastic Composites Made Using FDM/FFF**, *ASME*, 2022.
- C6. A. E. Patterson, **B. Vajipeyajula**, and W. R. Norris.  
**System Architecture and Design Parameters for Extrusion-Based Autonomous Construction Systems**, *ASME*, 2022.

- C7.** **B. Vajipeyajula**, E. Masad, K. L. Roja, and K. R. Rajagopal.  
**Permanent Deformation of Reclaimed Asphalt Blended Binders Using Nonlinear Viscoelastic Theory**, *AM3P*, 2020.
- C8.** K. L. Roja, **B. Vajipeyajula**, and E. Masad.  
**Multi-Scale Evaluation of Asphalt Binders Containing Different Proportions of Reclaimed Asphalt Pavement**, *RILEM – ISBM Lyon*, 2020.

## Papers in preparation

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- P1.** Impact of matrix material on the flexural strength of the additively manufactured polymeric parts.
- P2.** Density-driven model to analyse fatigue and failure initiation in PDMS

## Award Nominations

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- APT Provost faculty fellow- Nominated by College of Engineering -2024
- COE Engineering Teaching Impact Award- Nominated by the college of engineering -2024
- COE Engineering Teaching Impact Award- Nominated by Department of ETID -2024

## Technical Skills

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### Programming Languages:

C C++ Fortran Python

### Simulation and Analysis:

ANSYS Fluent Abaqus COMSOL

### CAD and Modeling:

SolidWorks Pro-E Creo

### Other Tools:

MATLAB LabVIEW Automation Studio

## Student Mentoring

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### Graduate Students (Master's):

- ➡ Michael James Townsend — Texas A&M(2022–2023)
- ➡ Jose Maria Beltra Mira — Texas A&M (2022–2023)
- ➡ Cody Tew — Texas A&M (2022–2023)
- ➡ Saranya Gunasekar — Texas A&M (2023–2025)
- ➡ Jonathan Sanchez - Texas A&M (2023-2025)

### Undergraduate Students:

- ➡ Arden Sinclair, Rhett Lee, Aren Davis, Sebastian Salazar, Henry Harshfield, Devin Hooper, Danny Tran, Rodrigo De La Cabada, Yu-Tien Ku — Texas A&M (2022)
- ➡ Adam Ledoux, Duy Pham, Cole Shannon — Texas A&M (2023)

## Leadership and Service

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### Academic Peer Reviewer:

- ➡ *Theoretical and Applied Fracture Mechanics* (2025-Present)
- ➡ *Journal of Physics of Fluids* (2018–Present)

- *International Journal of Pavement Engineering* (2022)
- *ASME International Additive Manufacturing Conference* (2022)
- *Advances in Materials and Pavement Performance Prediction* (2021–Present)

**Departmental Service — ETID, Texas A&M University:**

- ABET Review Committee Member (2022)
- Student Activity Committee Member (2022)
- Scholarship Committee Member (2023)
- Accessibility Liaison (ADA Title II) (2025)