

VIGNESHWARAN Radhakrishnan

<https://people.tamu.edu/~vigneshr/>

<https://www.linkedin.com/in/vigneshwaranradhakrishnan/>

College Station, Texas

vigneshr@tamu.edu

PROFESSIONAL PREPARATION

CURRENT Postdoctoral Researcher in Aerospace Engineering

MAY 2024 Texas A&M University, College Station, Texas

APR 2024 Ph.D. in Aerospace Engineering

AUG 2017 Texas A&M University, College Station, Texas

Advisor: Amine Benzerga

Dissertation: Three-Dimensional Simulations of Ductile Fracture under Arbitrary Loadings

GPA: 4/4

OCT 2020 Professional Flight Instruction

OCT 2018 Brazos Valley Flight Services, College Station, Texas

Instructor: Gary Gandy

Certification: Federal Aviation Administration (FAA) certified private pilot

MAY 2016 Master of Technology in Aerospace Engineering

AUG 2014 Indian Institute of Technology-Kanpur, India

Advisors: P.M.Mohite, C.S.Upadhyay

Thesis: Numerical Assessment of GLD Plasticity Model for Porous Materials

GPA: 10/10

MAY 2014 Bachelor of Engineering in Aeronautical Engineering

AUG 2010 Madras Institute of Technology, Anna University, India

Advisors: R. Dhanaraj, H.S.N. Murthy

Project: Optimisation of Ultrasonic Transducer Configuration for Detection of Cracks

GPA: 9.4/10

PROFESSIONAL EXPERIENCE

Mar 2024	-	Apr 2024	Research Engineer	Aero. Engg., Texas A&M University
Feb 2017	-	Aug 2024	Research Assistant	Aero. Engg., Texas A&M University
Aug 2018	-	Dec 2018	Teaching Assistant	Aero. Engg., Texas A&M University
Jul 2016	-	Jul 2017	Engineer	VEM Technologies Pvt. Ltd., Hyderabad, India
Jul 2015	-	Dec 2015	Teaching Assistant	Aero. Engg., IIT-Kanpur

PUBLICATIONS

- [1] **Vigneshwaran, R.** and A. A. Benzerga. "An analysis of failure in a shear specimen". In: *Int. J. Mech. Sci.* (2026). Accepted.
- [2] **Vigneshwaran, R.** and A. A. Benzerga. "Assessment of iterated variational homogenization estimates for microstructure evolution under unhomogeneous yielding". In: *Mechanics of Materials* (2026).

- [3] **Vigneshwaran, R.**, S. Datta, A. A. Benzerga, and S. P. Joshi. “A comparison of mechanism-based plasticity models for polycrystalline magnesium alloys”. In: *Int. J. Solids Struct.* (2026), p. 114180.
- [4] **Vigneshwaran, R.** and A. A. Benzerga. “Unhomogeneous yielding of porous materials — Evolution Equations”. In: *J. Mech. Phys. Solids* 196 (2025), p. 105973.
- [5] **Vigneshwaran, R.** and A. A. Benzerga. “Unhomogeneous yielding of porous materials — Evolution Equations”. In: *J. Mech. Phys. Solids* 196 (2025), p. 105973.
- [6] **Vigneshwaran, R.** and A. A. Benzerga. “An analysis of failure in shear versus tension”. In: *Eur. J. Mech. A/Solids* 104 (2024), p. 105074.
- [7] **Vigneshwaran, R.** and A. A. Benzerga. “Criterion for unhomogeneous yielding of porous materials”. In: *J. Mech. Phys. Solids* 192 (2024), p. 105804.
- [8] **Vigneshwaran, R.** and A. A. Benzerga. “Criterion for unhomogeneous yielding of porous materials”. In: *J. Mech. Phys. Solids* 192 (2024), p. 105804.
- [9] **Vigneshwaran, R.** and A. A. Benzerga. “Assessment of a two-surface plasticity model for hexagonal materials”. In: *J. Magnes. Alloys* 11.12 (2023), pp. 4431–4444.

CONFERENCE PROCEEDINGS:

- [10] **Vigneshwaran, R.** and A. A. Benzerga. “Finite Element Analysis of Ductile Failure Under Severe Shear”. In: *AIAA Scitech 2025 Forum*. 2025, p. 1360.
- [11] **Vigneshwaran, R.** and A. A. Benzerga. “A Predictive Multisurface Approach to Damage Modeling in Mg Alloys”. In: *Magnesium Technology 2022*. Cham: Springer International Publishing, 2022, pp. 293–297.

IN PREPARATION:

- [12] **Vigneshwaran, R.** and A. A. Benzerga. *Machine learning based damage model*. (preliminary draft).
- [13] **Vigneshwaran, R.** and A. A. Benzerga. *Unhomogeneous yielding of porous materials — Simple criterion*. (to be submitted).

INVITED TALKS

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- [1] **Vigneshwaran, R.** and A. A. Benzerga. “Ductile failure of a top-hat shear specimen”. Mechanics of materials seminar, Lawrence Livermore National Laboratories. 2025.
 - [2] **Vigneshwaran, R.** and A. A. Benzerga. “A Predictive Multisurface Approach to Damage Modeling in HCP Alloys”. Engineering and Applied Science Forum for Graduate Students, Post-doctoral Fellows, and Young Faculties. 2022.
 - [3] **Vigneshwaran, R.**, S. Wajid, D. Mortari, and A. A. Benzerga. “On limit analysis using functional interpolation”. Theory and Applications of Functional Interpolation to Optimization and Control, U.S. National Congress on Theoretical and Applied Mechanics. 2022.

CONFERENCE TALKS

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- [1] **Vigneshwaran, R.** and A. A. Benzerga. “A multisurface theory of ductile fracture for rate-dependent solids”. MACH 2023 conference. 2023.

- [2] A. A. Benzerga and **Vigneshwaran, R.** “Predictive modeling of fracture in anisotropic and porous materials”. Additive Manufacturing, TMS: The Minerals, Metals & Materials Society. 2022.
- [3] **Vigneshwaran, R.** and A. A. Benzerga. “A multisurface theory of ductile fracture for rate-dependent solids”. SES Annual Technical Conference. 2022.
- [4] **Vigneshwaran, R.** and A. A. Benzerga. “A multisurface theory of porous material plasticity”. SES Annual Technical Conference. 2022.
- [5] **Vigneshwaran, R.** and A. A. Benzerga. “A multisurface theory of porous material plasticity”. Micro-to-Macro Mechanics of Heterogeneous Solids and Granular Media, Society of Engineering Science Annual Technical Meeting 2022. 2022.
- [6] **Vigneshwaran, R.** and A. A. Benzerga. “A Predictive Multisurface Approach to Damage Modeling in Mg Alloys”. Magnesium Technology, TMS: The Minerals, Metals & Materials Society. 2022.
- [7] **Vigneshwaran, R.** and A. A. Benzerga. “Ductile Fracture Under General Loading Conditions: Theory and Implementation”. Modeling of the Fracture, Failure and Fatigue in Solids, ASME 2022 International Mechanical Engineering Congress and Exposition (IMECE2022). 2022.
- [8] **Vigneshwaran, R.** and A. A. Benzerga. “Ductile fracture under general loading conditions: theory and implementation”. Plasticity & Ductile Failure, U.S. National Congress on Theoretical and Applied Mechanics. 2022.
- [9] A. A. Benzerga and **Vigneshwaran, R.** “A crystal plasticity like theory of ductile fracture”. International Congress on Theoretical and Applied Mechanics (ICTAM). 2021.
- [10] H. Kitajima, A. A. Benzerga, J. F. Bluemel, **Vigneshwaran, R.**, P. Hubbard, M. Brankovic, and D. Brandenburg. “Strain Localization in Geomaterials”. Texas A&M Triads for Transformation. 2020.

POSTERS

- [1] **Vigneshwaran, R.** and A. A. Benzerga. “Assessment of two-surface plasticity model for hexagonal materials”. MACH 2023 conference. 2023.
- [2] **Vigneshwaran, R.** and A. A. Benzerga. “Three-Dimensional Simulations Of Ductile Fracture Under Arbitrary Loadings”. International Conference on Fracture. 2023.
- [3] **Vigneshwaran, R.** and A. A. Benzerga. “A Predictive Multisurface Approach to Damage Modeling in HCP Alloys”. NSF-Funded Research (Grad & Undergrad), ASME 2022 International Mechanical Engineering Congress and Exposition (IMECE2022). 2022.

TEACHING AND MENTORING EXPERIENCE

DEC 2024 SUBSTITUTE INSTRUCTOR, AERO. ENGG., TEXAS A&M UNIVERSITY

AUG 2024 *AERO304 - Aerospace Structural Analysis, Instructor: Amine Benzerga*

Delivered lectures on concepts of strain, traction, stress, and beam bending to a class of 90 students over three weeks.

DEC 2018 GRADUATE ASSISTANT, AERO. ENGG., TEXAS A&M UNIVERSITY

AUG 2018 *AERO306 - Aerospace Structural Analysis, Instructor: John Whitcomb*

Reviewed and graded quizzes, assignments, two mid-term exams, and a final exam for 40 students. Prepared and delivered two hours of lectures on virtual work methods in structural analysis.

DEC 2015 TEACHING ASSISTANT, AERO. ENGG., INDIAN INSTITUTE OF TECHNOLOGY-KANPUR

JUL 2015 *AE451 - Experiments in Aerospace Engineering, Instructor: Rajesh Kitey*

Taught concepts related to the experiment on 'Combined Loading of Aluminum Alloy'.
Graded laboratory reports for 50 students.

JULY 2021 MENTOR FOR UNDERGRADUATE STUDENT, AERO. ENGG., TEXAS A&M UNIVERSITY

JAN 2019 *Advisor: Amine Benzerga*

UG Student: Osvaldo Quintero

Trained Osvaldo to use ABAQUS software and guided him to develop a prototype ductile failure code that generates data for a machine learning model.

HONORS AND AWARDS

- **SES 2025- Future Faculty Symposium Award**
Awarded for participation at the 2nd future faculty symposium at the 2025 SES Annual Technical Conference.
- **Postdoctoral Mentoring Fellow**
A certification by the postdoctoral association, Texas A&M University.
- **ASME: IMECE 2022 - Honorable Mention**
Awarded at the 2022 CONCAM Student Poster Competition on Computational Mechanics by the ASME during the International Mechanical Engineering Congress & Exposition in Columbus, OH, USA.
- **USNC: 17th Travel Grant Award**
Awarded complimentary registration to the 17th U.S. National Congress on Computational Mechanics.
- **ICF: 15th Travel Grant Award**
Awarded complimentary registration to the 15th International Conference on Fracture.
- **SES 2022 Conference Funding Award**
Awarded complimentary registration to the 2022 SES Annual Technical Conference as a Student Volunteer Attendee.
- **Aero Graduate Excellence Fellowship Award**
Awarded for Academic Excellence in graduate school at Texas A&M University.
- **Certificate of Merit**
Awarded for Academic Excellence in the Master of Technology in Aerospace Engineering at IIT Kanpur.
- **Gold Medalist**
Achieved in B.E. Aeronautical Engineering at Madras Institute of Technology, Anna University.

COURSE WORKS

Aerospace Structural Analysis	Functional Interpolation	Plasticity Theory
Composite Materials	Micromechanics	Rocket and Missile Structures
Continuum Mechanics	Multiscale Mechanics	Smart Structures
Failure Mechanics	Nonlinear FEM	Spacecraft Dynamics
Finite Element Methods	Nonlinear Elasticity	
Fluid Mechanics	Numerical Methods of PDE	

SERVICE

- Reviewer of the Journal of Mechanics Research Communications, Mechanics of Solids, Journal of Dynamical Behaviour of Materials and Scientific Reports.
- Undergraduate thesis proposal reviewer at Texas A&M University.
- Judge at the Student Research Week of 2025, 2022 and 2021 at Texas A&M University: Judged sessions, ranked, and nominated presentations for awards at the largest student-run research symposium.
- Member of Texas Running Against Cancer (TRAC).

PROFESSIONAL AFFILIATIONS

- American Society of Mechanical Engineers (ASME)
- American Institute of Aeronautics and Astronautics (AIAA)
- ASM International
- Aircraft Owners and Pilots Association (AOPA)