

PRAJWAL KAMMARDI ARUNACHALA
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EDUCATION AND TRAINING

Johns Hopkins University, Baltimore, U.S. <i>Postdoctoral Researcher Advisor - Dr. Somnath Ghosh</i>	Current
Stanford University, Stanford, U.S. <i>Ph.D. in Civil and Environmental Engineering Advisor - Dr. Christian Linder</i>	September 2024 GPA: 4.08/4
Stanford University, Stanford, U.S. <i>M.S. in Civil and Environmental Engineering</i>	April 2019 GPA: 4.07/4
Indian Institute of Technology Bombay, Mumbai, India <i>B.Tech. (with Honors) in Civil Engineering Minor in Computer Science Engineering</i>	May 2017 GPA: 9.65/10

HONORS AND AWARDS

Juan C. Simo Best Thesis Award • Awarded by Mechanics & Computation Division, Dept. of Mechanical Engineering, Stanford University	2024
Finalist, Robert J. Melosh Medal Competition • Annual competition for best paper on finite element analysis by Duke University	2024
Travel Award for Rising Stars in Computational & Data Sciences Workshop	2024
Runner-up, Modeling Inelastic and Multiscale Behavior (MIMB) Competition • Annual student paper competition at Engineering Mechanics Institute (EMI) Conference	2023
Travel Awards for U.S. National Congress on Computational Mechanics (USNCCM)	2021,2023
Leavell Fellowship at Stanford University	2020-2022
Stanford School of Engineering Graduate Fellowship	2017
Institute Silver Medal, Vidyasagar Nehra and Prof. Madhav Kulkarni Gold Medals • Awarded for graduating from IIT Bombay as Civil department topper of the batch with Honors	2017
S.C.Mehrotra Prize, Institute Academic Prize • Awarded consecutively for three and two years respectively for academic excellence at IIT Bombay	2014-2016
National Talent Search (NTS) Scholarship • Recipient of the venerated National level merit scholarship awarded by the National Council of Education Research and Training, Government of India	2009-2016
Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship • Selected for the prestigious National Program of Fellowship in Basic Sciences awarded by the Department of Science and Technology, Government of India	2013
Karnataka Common Entrance Test (KCET) • Topped the state engineering entrance examination among 100,000 students	2013

ACADEMIC POSITIONS OF RESPONSIBILITY AND VOLUNTEERING

Member-at-Large, U.S. Association for Computational Mechanics (USACM) Student Chapter • Selected as a part of the inaugural 10 member team across U.S. to launch and shape its future goals • Part of the planning and execution team of <i>Student Meet and Greet</i> socializing event at the <i>U.S. National Congress on Computational Mechanics (USNCCM) 2023</i> for increasing the outreach • Initiated the <i>Computational Mechanics Student Mentorship Program (CMSMP)</i> to help students in the field get proper guidance regarding career and graduate journeys • Actively reached out to various R1 and R2 universities, and successfully matched 42 mentee-mentor pairs, with more than 35% of them belonging to underrepresented minority groups • Program experience was rated 5/5 by 7 out of 9 mentees who submitted the annual feedback form	2023-24
Academic Volunteering • Peer-reviewer for <i>International Journal for Numerical Methods in Engineering</i> • Volunteered during the <i>U.S. National Congress on Computational Mechanics (USNCCM) 2023</i> • Part of the organizing research lab of the <i>Berkeley/Stanford Computational Mechanics Festival (CompFest) 2018 & 2022</i> , and helped with the execution and technical support during the meet	

TEACHING AND MENTORING EXPERIENCES

Instructor-in-charge

- CEE 306 - Computational Fracture Mechanics, Stanford University Spring 2024

Teaching Assistant

- CEE 291 - Solid Mechanics, Stanford University Autumn 2019,2020,2023
- CEE 306 - Computational Fracture Mechanics, Stanford University Spring 2021
- CEE 312/ ME 338 - Continuum Mechanics, Stanford University Spring 2020
- CE 101 - Engineering Mechanics, IIT Bombay Spring 2015,2017

Graduate Student Mentor, Stanford University & Johns Hopkins University

Sep'22-Present

- Mentoring junior Ph.D. students of the group in their initial academic and research phases

Undergraduate Student Mentor, Civil Engineering Department, IIT Bombay

Apr'16-Mar'17

- Mentored a group of 6 sophomores in their academic and co-curricular pursuits
- Part of the ideation team of the Professor's Online Newsletter and Open House to increase student-teacher interaction
- Contributed to online course blogs by writing reviews to assist future batches in making informed decisions while selecting courses

PUBLICATIONS

- J.12 **P.K.Arunachala**, S.Abrari Vajari, C.Linder, A multiscale phase field fracture approach for strain-crystallizing rubber-like materials, [*In preparation*]
- J.11 **P.K.Arunachala**, S.Abrari Vajari, C.Linder, A multiscale phase field fracture approach for incompressible rubber-like materials, *Computer Methods in Applied Mechanics and Engineering* [*To be submitted*]
- J.10 **P.K.Arunachala**, S.Abrari Vajari, M.Neuner, J.S.Sim, R.Zhao, C.Linder, A multiscale anisotropic polymer network model coupled with phase field fracture, *International Journal for Numerical Methods in Engineering* 2024,e7488
- J.9 H-C.Wu, S.Nikzad, C.Zhu, H.Yan, Y.Li, W.Niu, J.R.Matthews, J.Xu, N.Matsuhisa, **P.K.Arunachala**, R.Rastak, C.Linder, Y-Q.Zheng, M.F.Toney, M.He, Z.Bao, Highly stretchable polymer semiconductor thin films with multi-modal energy dissipation and high relative stretchability, *Nature Communications* 2023:14(1),8382
- J.8 S.Abrari Vajari, M.Neuner, **P.K.Arunachala**, C.Linder, Investigation of driving forces in a phase field approach to mixed mode fracture of concrete, *Computer Methods in Applied Mechanics and Engineering* 2023:417,116404
- J.7 **P.K.Arunachala**, S.Abrari Vajari, M.Neuner, C.Linder, A multiscale phase field fracture approach based on the non-affine microsphere model for rubber-like materials, *Computer Methods in Applied Mechanics and Engineering* 2023:410,115982
- J.6 Y.Qiu, **P.K.Arunachala**, C.Linder, SenseNet: A physics-informed deep learning model for shape sensing, *Journal of Engineering Mechanics* 2023:149(3),04023002
- J.5 M.Neuner, S.Abrari Vajari, **P.K.Arunachala**, C.Linder, A better understanding of the mechanics of borehole breakout utilizing a finite strain gradient-enhanced micropolar continuum model, *Computers and Geotechnics* 2023:153,105064
- J.4 S.Abrari Vajari, M.Neuner, **P.K.Arunachala**, A.Ziccarelli, G.Deierlein, C.Linder, A thermodynamically consistent finite strain phase field approach to ductile fracture considering multi-axial stress states, *Computer Methods in Applied Mechanics and Engineering* 2022:400,115467
- J.3 **P.K.Arunachala**, R.Rastak, C.Linder, Energy based fracture initiation criterion for strain-crystallizing rubber-like materials with pre-existing cracks, *Journal of the Mechanics and Physics of Solids* 2021:157, 104617
- J.2 W.Wang, S.Wang, R.Rastak, Y.Ochiai, S.Niu, Y.Jiang, **P.K.Arunachala**, Y.Zheng, J.Xu, N.Matsuhisa, X.Yan, S-K.Kwon, M.Miyakawa, Z.Zhang, R.Ning, A.Foudeh, Y.Yun, C.Linder, J.B-H.Tok, Z.Bao, Strain-insensitive intrinsically stretchable transistors and circuits, *Nature Electronics* 2021:4(2),1-8
- J.1 V.I.Patel, B.Uy, **K.A.Prajwal**, F.Aslani, Confined concrete model of circular, elliptical and octagonal CFST short columns, *Steel and Composite Structures, An International Journal* 2016:22(3),497-520

Conference Presentations

- P.16 **P.K.Arunachala**, C.Linder, A multiscale phase field formulation for capturing the fracture behavior of rubber-like materials, *Engineering Mechanics Institute (EMI) Conference*, Chicago, May 2024.
- P.15 **P.K.Arunachala**, W.Xue, M.Neuner, C.Linder, Multiscale phase field mixed formulation for predicting fracture behavior in incompressible rubber-like materials, *U.S. National Congress on Computational Mechanics (USNCCM)*, Albuquerque, July 2023.
- P.14 **P.K.Arunachala**, M.Neuner, C.Linder, Capturing anisotropy in network response in rubber-like materials using a multiscale phase field formulation, *Engineering Mechanics Institute (EMI) Conference*, Georgia Institute of Technology, Atlanta, June 2023.
- P.13 **P.K.Arunachala**, M.Neuner, S.Abrari Vajari, C.Linder, Multiscale phase field approach for modeling fracture behavior in rubber-like materials, *Engineering Mechanics Institute (EMI) Conference*, Johns Hopkins University, Baltimore, June 2022.
- P.12 **P.K.Arunachala**, R.Rastak, C.Linder, Multiscale mechanical model coupled with an energy-based criterion for predicting fracture initiation in strain-crystallizing rubbers, *U.S. National Congress on Computational Mechanics (USNCCM)*, Virtual, July 2021.
- P.11 **P.K.Arunachala**, R.Rastak, C.Linder, Effect of strain-induced crystallization on fracture of rubber-like materials, *Engineering Mechanics Institute (EMI) Conference*, California Institute of Technology, Pasadena, June 2019.

Invited Talks, Seminars, and Review Meetings

- P.10 **P.K.Arunachala**, C.Linder, A multiscale phase field formulation for capturing fracture behavior of rubber-like materials, *Robert J. Melosh Medal Competition*, Duke University, Durham, October 2024.
- P.9 **P.K.Arunachala**, C.Linder, [Poster] Computational modeling of fracture behavior of polymers, *Stanford-IIT Bombay Workshop on Sustainability*, Stanford University, Stanford, July 2024.
- P.8 **P.K.Arunachala**, C.Linder, Multiscale framework for fracture modeling in rubber-like materials, *Rising Stars in Computational & Data Sciences*, Oden Institute, Austin, May 2024.
- P.7 **P.K.Arunachala**, S.Abrari Vajari, M.Neuner, C.Linder, A multiscale fracture model for rubber-like materials, *School of Sustainability Research Review*, Stanford University, Stanford, May 2023.
- P.6 **P.K.Arunachala**, S.Abrari Vajari, M.Neuner, C.Linder, Non-affine multiscale fracture model for rubber-like materials, *Berkeley/Stanford Computational Mechanics Festival (CompFest)*, Stanford University, Stanford, December 2022.
- P.5 **P.K.Arunachala**, S.Abrari Vajari, M.Neuner, C.Linder, [Poster] A multiscale fracture model using phase field approach, *Blume/SURI Affiliate and Alumni Meeting*, Stanford University, Stanford, October 2022.
- P.4 **P.K.Arunachala**, S.Abrari Vajari, M.Neuner, C.Linder, [Poster] A multiscale fracture model using phase field approach, *PSAAP III Annual Review*, University of Colorado, Boulder, September 2022.
- P.3 **P.K.Arunachala**, M.Neuner, S.Abrari Vajari, C.Linder, Multiscale fracture model for rubber-like polymers, *CEE Summer Student Speaker Series*, Stanford University, Stanford, July 2022.
- P.2 **P.K.Arunachala**, S.Abrari Vajari, M.Neuner, C.Linder, Embedded Finite Element Method in MOOSE for modeling crack propagation, *PSAAP III Annual Review*, Virtual, September 2021.
- P.1 **P.K.Arunachala**, R.Rastak, C.Linder, Energy criterion for fracture initiation in strain-crystallizing rubbers, *Berkeley/Stanford Computational Mechanics Festival (CompFest)*, Virtual, August 2020.