

# SRISHARAN SHREEDHARAN

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## Education

Ph.D., Geosciences, The Pennsylvania State University, **2021 (expected)**.

M.S., Geological Engineering, The University of Arizona, **2016**.

B.Tech., Mining Engineering, National Institute of Technology, Karnataka, **2014**.

## Employment

Research Assistant, Chris Marone/Demian Saffer, Penn State Rock and Sediment Mechanics Lab, **2016 – Present**.

Research Assistant, Pinnaduwa Kulatilake, Rock Mass Modeling and Computational Rock Mechanics Laboratories, The University of Arizona, **2014 – 2016**.

Undergrad Research Intern, Department of Civil Engineering, Indian Institute of Technology (IIT) - Madras, India, **Summer 2013**.

Undergrad Research Intern, Julius Kruttschnitt Mineral Research Centre (JKMRC), The University of Queensland, Australia, **Winter 2012**.

## Honors & Awards

US Science Support Program (USSSP) Post Expedition Award, IODP Expedition 375, **Fall 2018**

AGU Outstanding Student Paper Award, Seismology section, **Fall 2017**

Shell Geosciences Energy Research Facilitation Award, **2017, 2018**

Paul D. Krynine Travel Award, **2017, 2018**

Arnulf I. Muan Graduate Fellowship in Earth and Mineral Sciences, **2016 – 17**

Penn State University Graduate Fellowship, **2016 – 17**

Society for Mining, Metallurgy and Exploration Tucson Scholarship, **2015 – 16**

The Women's Auxiliary to the American Institute of Mining, Metallurgical and Petroleum Engineers Scholarship, **2015 – 16**

The University of Arizona Graduate Tuition Scholarship, **2014 – 16**

Neyveli Lignite Corporation (NLC) Gold Medal for best outgoing student in NITK, **2014**

The University of Queensland Summer Research Scholarship, **2012**

## Peer-Reviewed Publications

6. Saffer, D. M., Wallace, L. M., Petronotis, K., and the **Expedition 375 Scientists**. (2018). *Expedition 375 Preliminary Report: Hikurangi Subduction Margin Coring and Observatories*. International Ocean Discovery Program. doi: 10.14379/iodp.pr.375.2018
5. Huang, G., Kulatilake, P. H. S. W., **Shreedharan, S.**, Cai, S., Song, H. (2017). 3-D Discontinuum Numerical Modeling of Subsidence incorporating Ore Extraction and Backfilling Operations in an Underground Iron Mine in China. *International Journal of Mining Science and Technology*, 27(2), 191-201. doi: 10.1016/j.ijmst.2017.01.015
4. Ram Chandar, K., Sastry, V. R., Hegde, C., **Shreedharan, S.** (2016). Prediction of Peak Particle Velocity using Multi Regression Analysis. *Geomechanics and Geoengineering*. doi: 10.1080/17486025.2016.1184763
3. Kulatilake, P. H. S. W., **Shreedharan, S.**, Sherizadeh, T., Shu, B., He, P., Xing, Y. (2016). Laboratory Estimation of Rock Joint Stiffness and Frictional Parameters. *Geotechnical and Geological Engineering*, 34 (6), 1723-1735. doi: 10.1007/s10706-016-9984-y
2. **Shreedharan, S.**, Kulatilake, P. H. S. W. (2015). Discontinuum-Equivalent Continuum Analysis of the Stability of Tunnels in a Deep Coal Mine using the Distinct Element Method. *Rock Mechanics and Rock Engineering*, 49(5), 1903-1922. doi: 10.1007/s00603-015-0885-9
1. **Shreedharan, S.**, Hegde, C., Sharma, S., Vardhan, H. (2014). Acoustic Fingerprinting for Rock Identification during Drilling. *International Journal of Mining and Mineral Engineering*, 5(2), 89-105. doi: 10.1504/IJMME.2014.060193

## In Prep

1. **Shreedharan, S.**, Rivière, J., Bhattacharya, P., Marone, C. Frictional State Evolution during Normal Stress Perturbations Probed with Ultrasonic Waves. *JGR: Solid Earth (In review)*

## Conference Abstracts & Presentations

<sup>†</sup> – Presenting Author

13. **Shreedharan, S.<sup>†</sup>**, Rivière, J., Ryan, K., Marone, C. (2018). Precursory changes in p- and s- phase amplitudes and velocities linked to accelerated fault creep during laboratory slip instabilities. *AGU Fall Meeting 2018, Washington DC*. (Invited Talk)
12. **Shreedharan, S.<sup>†</sup>**, Rivière, J., Marone, C. (2018). Probing changes in frictional state due to normal stress perturbations using controlled-source ultrasonics. *AGU Fall Meeting 2018, Washington DC*. (Poster)
11. Rabinowitz, H.S.<sup>†</sup>, Savage, H.M., **Shreedharan, S.**, Ikari, M., Meneghini, F., Ito, Y., Kitajima, H., Wallace, L.M., Saffer, D.M., Petronotis, K., and the Expeditions 372/375 Scientists. (2018). Frictional behavior of incoming sediment in the Hikurangi subduction zone at *in-situ* PT conditions. *AGU Fall Meeting 2018, Washington DC*. (Poster)

10. Savage, H.M.<sup>†</sup>, Coffey, G.L., **Shreedharan, S.**, Polissar, P.J., Fagereng, A., Meneghini, F., Morgan, J., Wang, M., Hashimoto, Y., Wallace, L.M., Saffer, D.M., Barnes, P., Pecher, I.A., Petronotis, K., LeVay, L., and the Expeditions 372/375 Scientists. (2018). Signatures of Brittle Deformation in a Shallow Fault in the Hikurangi Subduction Margin. *AGU Fall Meeting 2018, Washington DC*. (Poster)
9. Jeppson, T.<sup>†</sup>, Kitajima, H., Ikari, M., Lee, H., Ito, Y., Harris, R., **Shreedharan, S.**, ..., Wallace, L.M., Saffer, D.M., Parnes, P., Pecher, I.A., Petronotis, K., LeVay, L., and the Expeditions 372/375 Scientists. (2018). Lithology and cement controls on the evolution of compressional wave velocity and porosity in input materials at northern Hikurangi and other subduction zones. *AGU Fall Meeting 2018, Washington DC*. (Poster)
8. Ryan, K.<sup>†</sup>, **Shreedharan, S.** (2018). Rubbing and pressing rocks together with a big computer controlled press to learn about the times when the ground shakes a lot as pieces of the world move around. *AGU Fall Meeting 2018, Washington DC*. (Talk)
7. **Shreedharan, S.**<sup>†</sup>, Rivière, J., Bhattacharya, P., Marone, C. (2018). The Sound of Friction: Probing Fault Microphysics During Normal Stress Variations Using Controlled-Source Ultrasonics. *Penn State Geodynamics Seminar*. (Talk)
6. **Shreedharan, S.**<sup>†</sup>, Rivière, J., Marone, C. (2018). Precursory Changes in p- and s- Phase Amplitudes and Velocities Linked to Accelerated Fault Creep During Laboratory Slip Instabilities. *Gordon Research Conference on Rock Deformation 2018*. (Poster)
5. **Shreedharan, S.**<sup>†</sup>, Rivière, J., Marone, C. (2017). Frictional Response of Simulated Faults to Normal Stress Perturbations probed with Ultrasonic Waves. *AGU Fall Meeting 2017, New Orleans*. (Poster)
4. **Shreedharan, S.**<sup>†</sup>, Rivière, J., Bolton, C., Zheng, L., Johnson, P., Marone, C. Characterization of Acoustic Emissions From Laboratory Stick-Slip Events in Simulated Fault Gouge. *ARMA Symposium - 51th US Rock Mechanics Symposium, Houston*. (Talk)
3. **Shreedharan, S.**<sup>†</sup>, Rivière, J., Marone, C. (2017). Frictional Response of Simulated Faults to Normal Stress Perturbations probed with Ultrasonic Waves. *49th Annual Geosciences Graduate Student Colloquium*. Pennsylvania State University. (Talk)
2. Kulatilake, P. H. S. W.<sup>†</sup>, **Shreedharan, S.**, Huang, G., Cai, S., Song, H. (2016). 3-D Discontinuum Numerical Modeling of Ore Extraction, Backfilling and Subsidence in an Underground Iron Mine in China. *ARMA Symposium - 50th US Rock Mechanics Symposium, Houston*. (Talk)
1. **Shreedharan, S.**<sup>†</sup>, Kulatilake, P. H. S. W. (2016). Distinct Element Method Based Stability Analysis of Tunnels in a Deep Coal Mine in China. *ARMA Symposium - 50th US Rock Mechanics Symposium, Houston*. (Poster)

## Technical Skills

*Programming languages:* Python, C++, R, Fish

*General engineering tools:* MATLAB, ANSYS, COMSOL, Solidworks

*Geologic modeling tools:* FLAC, 3DEC, PFC2D/3D, Rocscience Suite, Petrel, ProMAX

## Teaching

GEOSC497: Multi-Channel Seismic Processing - "An Introduction to Marine Seismic Data Acquisition", **Fall 2017**.

GEOSC508: The Mechanics of Earthquakes and Faulting - "Building a Wheatstone's Bridge Strain Gauge Circuit - Demo", **Fall 2017**.

MN302: Mine Environment and Ventilation - Prepared free online lecture material available online at [www.nptel.ac.in](http://www.nptel.ac.in), **2012 – 13**.

## Field Experience

*R/V JOIDES Resolution* - IODP 375: Hikurangi Slow Earthquakes, Petrophysicist, **2018**.

*R/V Revelle* - Multi-Channel Seismic data acquisition cruise at Cascadia Margin, **2017**.

Fracture mapping survey for slope stability analysis using LiDAR scanning and 3D photogrammetry at Singareni coal mines, **2012**.

Field deployment of geophones for blast vibration monitoring survey at Singareni coal mines, **2012**.

## Service

Reviewer for *Earth and Planetary Science Letters*, *Journal of Computational Science* and *International Journal of Oil, Gas and Coal Technology*

Co-chair of the Department of Geoscience Computer Users' Group, **2017 – Present**

Penn State Department of Geoscience Grad Colloquium Committee, **2018 – 19**

Penn State Graduate Research Exhibition poster judge, **2017**

Graduate and Professional Students' Council Travel Grants Judge, The University of Arizona, **2015 – 2016**

## Outreach and Miscellany

Rock Climbing Instructor, State College YMCA, **2017 – Present**

Earth and Mineral Science Exposition Open House at Penn State - A virtual tour of the R/V JOIDES Resolution, **2018**

Shake, Rattle, Rocks geology outreach for State College school district fifth graders, **2017**

## Professional Memberships

American Geophysical Union

American Rock Mechanics Association

Seismological Society of America