SRISHARAN SHREEDHARAN

Department of Geosciences
Utah State University
Logan, UT 84322

srisharan.github.io
srisharan.shreedharan@usu.edu
(520) 286-7831

Professional Appointments

Utah State University, Department of Geosciences
Assistant Professor — **Jan 2023 – Present**

The University of Texas Institute for Geophysics
Research Affiliate (zero-time) — **Jan – June 2023**
Distinguished Postdoctoral Fellow — **March 2021 – Dec 2022**

Education

The Pennsylvania State University
Ph.D., Geosciences — **May 2021**

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

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

Peer-Reviewed Publications

Published

22. **Shreedharan, S.**, Saffer, D., Wallace, L., Williams, C. Ultralow frictional healing explains shallow slow slip events. *Science, 379(6633)*, 712-717. doi:10.1126/science.adf4930

21. Seyler, C., **Shreedharan, S.**, Saffer, D., Marone, C. The role of clay in limiting frictional healing in fault gouges. *Geophysical Research Letters*, 50. doi:10.1029/2023GL104984

20. Cebry, S.B.L., Ke, C.Y., **Shreedharan, S.**, Marone, C., Kammer, D.S., McLaskey, G. (2022). Creep Fronts and Complexity in Laboratory Earthquake Sequences. *Nature Communications, 13*(6839). doi: 10.1038/s41467-022-34397-0

19. Bolton, D.C., **Shreedharan, S.**, McLaskey, G.C., Riviere, J., Shokouhi, P., Trugman, D., Marone, C. (2022). The high-frequency signature of slow and fast laboratory earthquakes. *JGR: Solid Earth, 127*. doi: 10.1029/2022JB024170

18. **Shreedharan, S.**, Ikari, M., Wood, C., Saffer, D., Wallace, L., Marone, C. (2022). Frictional and Lithological Controls on Shallow Slow Slip at the Northern Hikurangi Margin. *G-Cubed, 23*. doi: 10.1029/2021GC010107

17. Trehu, A.M., Tominaga, M., Lyle, M., Davenport, K., Phrampus, B., Favorito, J., Zhang, E., Lenz, B.L., **Shreedharan, S.**, Yelisetti, S. and the RR1718 science party. (2022). The hidden

history of the south-central Cascadia subduction zone recorded on the Juan de Fuca plate offshore southwest Oregon. *G-Cubed, 23*. doi: 10.1029/2021GC010318

16. Bolton, D. C., **Shreedharan, S.**, Rivière, J., Marone, C. (2021). Frequency-Magnitude Statistics of Laboratory Foreshocks Vary With Shear Velocity, Fault Slip Rate, and Shear Stress. *JGR: Solid Earth, 126*. doi: 10.1029/2021JB022175

15. **Shreedharan, S.**, Bolton, D. C., Rivière, J., Marone, C. (2021). Machine Learning Predicts the Timing and Shear Stress Evolution of Lab Earthquakes Using Active Seismic Monitoring of Fault Zone Processes. *JGR: Solid Earth, 126*. doi: 10.1029/2020JB021588

14. Savage, H., **Shreedharan, S.**, Fagereng, A., Morgan, J., Meneghini, F., Wang, M., McNamara, D., Wallace, L., Saffer, D., Barnes, P., Petronotis, K., LeVay, L. (2021). Asymmetric Brittle Deformation at the Papaku Fault, Hikurangi Subduction Margin, NZ, IODP Expedition 375. *Geochemistry, Geophysics, Geosystems*. doi: 10.1029/2021GC009662

13. Shokouhi, P., Girkar, V., Seperinezhad, A., **Shreedharan, S.**, Marone, C., Rivière, J., Giles, C.L., Kifer, D. (2021). Deep learning can predict the size and timing of laboratory quakes from active source seismic data. *Geophysical Research Letters, 48*. doi: 10.1029/2021GL093187

12. **Shreedharan, S.**, Bolton., D. C., Rivière, J., Marone, C. (2021). Competition between preslip and deviatoric stress modulates precursors for laboratory earthquakes. *Earth and Planetary Science Letters, 553*. doi: 10.1016/j.epsl.2020.116623

11. Bolton., D. C., **Shreedharan, S.**, Rivière, J., Marone, C. (2020). Acoustic energy release during the laboratory seismic cycle: Insights on laboratory earthquake precursors and prediction. *JGR: Solid Earth*. doi: 10.1029/2019JB018975

10. **Shreedharan, S.**, Bolton., D. C., Rivière, J., Marone, C. (2020). Preseismic fault creep and elastic wave amplitude precursors scale with lab earthquake magnitude for the continuum of tectonic failure modes. *Geophysical Research Letters, 47*(8). doi: 10.1029/2020GL086986

9. Barnes, P., et al. [IODP Expedition 372/375 Scientists, including **Shreedharan, S.**]. (2020). Slow slip source characterized by lithological and geometric heterogeneity. *Science Advances, 6*(13). doi: 10.1126/sciadv.aay3314

8. **Shreedharan, S.**, Rivière, J., Bhattacharya, P., Marone, C. (2019). Frictional State Evolution during Normal Stress Perturbations Probed with Ultrasonic Waves. *JGR: Solid Earth*, 124, 5469-5491. doi: 10.1029/2018JB016885

7. Fagereng, Å., et al. [IODP Expedition 372/375 Scientists, including **Shreedharan, S.**]. (2019). Mixed deformation styles observed on a shallow subduction thrust, Hikurangi margin, New Zealand. *Geology, 47*(9), 872-876. doi: 10.1130/G46367.1

6. Gray, M., et al. [IODP Expedition 372/375 Scientists, including **Shreedharan, S.**]. (2019). Imaging the shallow subsurface structure of the north Hikurangi subduction zone, New Zealand, using 2D Full–Waveform Inversion. *JGR: Solid Earth*, 124. doi: 10.1029/2019JB017793

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*, *12*(3), 207-214. 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 Review

1. **Shreedharan, S.**, Lavier, L., Marone, C. Complex rupture sequences in homogeneous laboratory and numerical fault models.

Technical Reports

2. Wallace, L. M., Saffer, D. M., Barnes, P. M., Pecher, I. A., Petronotis, K. E., LeVay, L. J., and the **Expedition 372/375 Scientists**. (2019). *Hikurangi Subduction Margin Coring, Logging, and Observatories.* Proceedings of the International Ocean Discovery Program, 372B/375: College Station, TX (International Ocean Discovery Program). doi: 10.14379/iodp.proc.372B375.2019

1. 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

Grants

Pending

5. NSF MG&G, **$ 319,550**, *"Collaborative Research: Influence of fault frictional healing and realistic tectonic loading rates on shallow subduction megathrust locking"*, PI: **Shreedharan**; Co-PIs: D. Saffer and L. Wallace (UT Austin) **2024 – 27**

4. NSF Geophysics, **$ 307,581**, *"Collaborative Research: Evolution of elastic wave properties during the seismic cycle: Experiments on dry and fluid pressurized meter-scale faults"*, PI: **Shreedharan**; Co-PI: G. McLaskey (Cornell) **2024 – 27**

3. USGS Earthquake Hazards Program, **$ 62,259**, *"Laboratory earthquakes in heterogeneous, meter-scale faults: Collaborative Research with Utah State University, and University of Texas at Austin"*, PI: **Shreedharan**; Co-PI: D.C. Bolton (UT Austin) **2024 – 25**

2. USGS EHP, **$ 63,159**, *"Effect of fault strength and frictional healing on strain accumulation in the shallow megathrust at the Cascadia subduction margin"*, PI: **Shreedharan** **2024 – 25**

1. USGS EHP, **$ 66,380**, *"Characterizing the frictional strength, stability, and fabric evolution of the Wasatch fault zone through laboratory experiments"*, PI: **Shreedharan**; Co-PI: A. Ault **2024 – 25**

Past

3. Geophysics Curricular Funds, UT Jackson School, **$ 14,375**, *"Imaging earthquake nucleation on meter scale laboratory fault"*, PI: Trugman; Co-PIs: Bolton, **Shreedharan**, Saffer **2021 – 22**

2. Schlanger Ocean Drilling Fellowship, IODP, **$ 30,000**, *"Fault Healing and Shallow Slow Slip at the Hikurangi Subduction Margin: The Impact of Normal Stress and Loading-Rate on Friction"*, PI (proxy): Marone; Co-PI: **Shreedharan** **2019 – 20**

1. USSSP Post Expedition Award, IODP Expedition 375, **$ 18,000**, *"Frictional Properties of Sediments from the Hikurangi Subduction Zone, New Zealand: Implications for Slow Earthquakes"*, PI (proxy): Marone; Co-PI: **Shreedharan** **2018-19**

Awards

UT Institute for Geophysics Palisades Postdoctoral Fellowship ($ 120k)	**2021 – 23**
Shell Geosciences Energy Research Facilitation Award ($ 6k)	**2017 – 20**
Paul D. Krynine Travel Award	**2017 – 20**
AGU Outstanding Student Paper Award, Seismology section	**2017**
Arnulf I. Muan Graduate Fellowship in Earth and Mineral Sciences ($ 5k)	**2016 – 17**
Penn State University Graduate Fellowship ($ 30k)	**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**
The University of Queensland Summer Research Scholarship	**2012**

Invited Talks

18. Workshop on AI for Understanding Earthquakes, Boston University	November 2023
17. University of Utah SeismoTea	April 2023
16. CIG Fault Mechanics for Numerical Modeling Seminar	February 2023
15. American Geophysical Union, Fall Meeting 2022	December 2022
14. Tectonophysics seminar, Texas A&M University	September 2022
13. Gordon Research Seminar 2022	August 2022
12. Center for Earthquake Research and Information, Memphis	April 2022
11. UTIG Seminar Series, UT Institute for Geophysics	February 2022

10. Department of Geosciences, Utah State University — January 2022
9. Earth & Environmental Sciences Seminar, New Mexico Tech — November 2021
8. TECTONIC/FEAR Virtual Seminars on Earthquake Physics — June 2021
7. Marine Geology and Geophysics Seminar, University of Washington — April 2021
6. Earth Structures and Simulations Seminar, Utrecht University — March 2021
5. South Dakota School of Mines and Technology — March 2021
4. American Geophysical Union, Online Fall Meeting 2020 — December 2020
3. Geological Society of America, Annual Meeting 2020, GSA Connects Online — October 2020
2. Indian Institute of Technology Bhubaneswar, India — May 2019
1. American Geophysical Union, Fall Meeting 2018, Washington DC — December 2018

Teaching

Utah State University

1. GEO6250/7250: Rock Deformation and Earthquake Mechanics (3 credits) — **Fall 2023**

Mentorship

Graduate students

1. Sapana Regmi, MS Student, Utah State University — **2023 - Present**

Thesis Supervisory Committees

1. Alex DiMonte, PhD student, Utah State University — **2023 - Present**

Former students

1. Brianna Fernandez, UT Austin (undergrad intern) — **Summer 2022**
2. Kevin Chung, UT Austin (undergrad intern) — **Summer 2021**
3. Julia Krogh, Penn State (undergrad gap year) — **2019 - 20**
4. Anne Stein, Penn State (High school intern) — **Summer 2017**

Shipboard Experience

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

R/V Revelle - Multi-Channel Seismic Chief Scientist training cruise at Cascadia Margin — **2017**

Service

Professional Service

1. Chair of AGU session "Slow-to-fast earthquakes from shallow to deep: Observations, Experiments, and Numerical Modeling" **Dec 2023**
2. Chair of AGU session "Frictional, Geological, and Geophysical Signatures of Fault Healing: Mechanisms and Implications for Deformation During the Earthquake Cycle" **Dec 2022**
3. Subduction Zones in 4D (SZ4D) Experimental Rock Deformation Ad-hoc committee **2022**
4. Review Editor of Earth and Planetary Materials for *Frontiers in Earth Science* **2021-22**
5. AGU Outstanding Student Paper/Poster Award judge **2021**

Peer Review

1. Ad-hoc reviewer for *US National Science Foundation* (Geophysics, Marine Geology & Geophysics) and *US Department of Energy* Office of Science.
2. Internal peer-reviewer for *US Geological Survey* and *UTIG*.
3. Journal reviewer for *Earth and Planetary Science Letters*, *EGU Solid Earth*, *Frontiers in Earth Science*, *Geochemistry, Geophysics, Geosystems*, *Geophysical Research Letters*, *International Journal of Oil, Gas and Coal Technology*, *Journal of Computational Science*, *Journal of Engineering Mechanics*, *JGR: Solid Earth*, *Journal of Rock Mechanics and Geotechnical Engineering*, *Journal of Structural Geology*, *Rock Mechanics and Rock Engineering*, *Science Advances*, *Tectonophysics*.

Institutional Service

1. Committee member, Geosciences Department faculty search, Assistant Professor in Critical Zone Geosciences. **2023-24**
2. External member, Civil and Environmental Engineering Department faculty search, Associate, Assistant, or Full Professor in Structural Earthquake Engineering. **2023-24**

Outreach and Miscellany

Native American Summer Mentorship Program, USU **Summer 2023**

Jackson School Research Traineeship Experience (RTX) mentor **Summer 2021, 2022**

Discovery Space summer camp outreach **Summer 2019**

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**

In the News Media

Slow motion: Scientists investigate tectonic plate boundary earthquake behavior, EurekAlert! **March 2023**

The physics behind earthquakes explained, Popular Mechanics **March 2023**

The Age of A.I. - Saving the world one algorithm at a time, YouTube documentary **Jan. 2020**

Researchers embark on first-ever slow earthquake drilling mission, EurekAlert! **Mar. 2018**

Conference Abstracts & Presentations

† – Presenting Author
$ – Invited presentation

33. Cebry, S.B.L.†$, Ke, C.Y., **Shreedharan, S.**, Marone, C., Kammer, D., McLaskey, G.(2023). Complex laboratory earthquake sequences show asperity interactions through creep fronts and illuminate the mechanics of delayed earthquake triggering. *EGU Annual Meeting, Vienna, Austria*. (Talk)

32. **Shreedharan, S.**†$, Saffer, D., Wallace, L., Williams, C. (2022). Relationship between ultra-low frictional healing and shallow slow slip at the northern Hikurangi margin. *AGU Fall Meeting 2022, Chicago*. (Talk)

31. **Shreedharan, S.**†$, Bolton, D.C., Rivière, J., Marone, C. (2022). Laboratory earthquake forecasting using elastic wave properties and machine learning. *AGU Fall Meeting 2022, Chicago*. (Talk)

30. **Shreedharan, S.**†$, Lavier, L., Marone, C. (2022). Scaling of the critical slip distance with fault zone thickness produces a family of slow earthquake modes. *Gordon Research Seminar on Rock Deformation, Maine*. (Talk)

29. **Shreedharan, S.**†, Lavier, L., Marone, C. (2022). Scaling of the critical slip distance with fault zone thickness produces a family of slow earthquake modes. *Gordon Research Conference on Rock Deformation, Maine*. (Poster)

28. **Shreedharan, S.**†, Ikari, M., Wood, C., Saffer, D.M., Wallace, L.M., Marone, C. (2021). Frictional and lithological controls on shallow slow slip at the northern Hikurangi margin. *AGU Fall Meeting 2021, New Orleans*. (Talk)

27. **Shreedharan, S.**†, Chung, K., Lavier, L., Saffer, D.M., Wallace, L.M. (2021). Effect of lithological heterogeneities on shallow slow slip events: An example from the northern Hikurangi margin, New Zealand. *AGU Fall Meeting 2021, New Orleans*. (Poster)

26. McLaskey, G.C.†$, Cebry, S.B.L., Ke, C.Y., **Shreedharan, S.**, Marone, C., Kammer, D.S. (2021). Creep fronts and asperity interactions in laboratory earthquake sequences illuminate delayed earthquake triggering. *AGU Fall Meeting 2021, New Orleans*. (Talk)

25. **Shreedharan, S.**†$, Bolton, D.C., Rivière, J., Marone, C. (2020). On the Pre-, Co-, and Post-seismic evolution of elastic wave properties for slow and fast laboratory earthquakes. *AGU Fall Meeting 2020, Online.* (Talk)

24. **Shreedharan, S.**†, Marone, C., Saffer, D. M., Wallace, L. M. (2020). Role of basalt alteration on slip behavior at the Hikurangi subduction zone. *AGU Fall Meeting 2020, Online.* (Talk)

23. Bolton, D. C.[†], **Shreedharan, S.**, Rivière, J., Marone, C. (2020). The influence of fault slip rate on temporal variations in frequency-magnitude statistics of acoustic emissions throughout the laboratory seismic cycle. *AGU Fall Meeting 2020, Online.* (Poster)

22. Shokouhi, P.[†], Girkar, V. S., Sepherinezhad, A., **Shreedharan, S.**, Rivière, J., Marone, C., Kifer, D. (2020). Deep learning of the precursory signatures in active source seismic data for improved prediction of laboratory earthquakes. *AGU Fall Meeting 2020, Online.* (Poster)

21. McIntyre, A.[†], Beard, J., **Shreedharan, S.**, Kitajima, H. (2020). Image analysis of drill core samples from the Hikurangi subduction margine, New Zealand. *AGU Fall Meeting 2020, Online.* (Poster)

20. **Shreedharan, S.**[†$], Bolton, D.C., Rivière, J., Marone, C. (2020). Pre-seismic fault creep and the evolution of elastic wave properties for slow and fast laboratory earthquakes. *GSA Annual Meeting 2020, Online.* (Talk)

19. **Shreedharan, S.**, Marone, C., Saffer, D.M.[†], Wallace, L. (2019). The role of basalt alteration on slip behavior at the Hikurangi subduction zone. *IODP 372/375 Post-Expedition Workshop, Napier, New Zealand*. (Poster - cancelled due to covid-19)

18. **Shreedharan, S.**[†], Bolton, D.C., Rivière, J., Marone, C. (2019). The Physics of Elastic Precursors to Laboratory Earthquakes. *AGU Fall Meeting 2019, San Francisco.* (Talk)

17. Bolton, D.C.[†], **Shreedharan, S.**, Rivière, J., Shokouhi, P., Marone, C. (2019). Frequency content of lab earthquakes for the spectrum of failure modes, from slow slip to elastodynamic rupture. *AGU Fall Meeting 2019, San Francisco.* (Poster)

16. Cebry, S.B.L.[†], Ke, C.Y., **Shreedharan, S.**, Marone, C., Kammer, D.S., McLaskey, G. (2019). Laboratory observations of frictional stability and fault zone evolution under heterogeneous friction, rheology, and stress conditions. *AGU Fall Meeting 2019, San Francisco.* (Talk)

15. **Shreedharan, S.**[†], Bolton, D.C., Rivière, J., Marone, C. (2019). Laboratory earthquake prediction using supervised machine learning applied on controlled-source ultrasonic amplitudes and velocities. *Institute for CyberScience Symposium 2019, Penn State*. (Poster)

14. **Shreedharan, S.**[†], Rivière, J., Bhattacharya, P., Marone, C. (2019). The Sound of Friction: Probing Fault Microphysics During Normal Stress Variations Using Controlled-Source Ultrasonics. *Seismology Student Workshop, Lamont-Doherty Earth Observatory*. (Talk)

13. **Shreedharan, S.**[†$], 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*. (Talk)

12. **Shreedharan, S.**[†], 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.[†], 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.†, 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.†, 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.†, **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.**†, 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.**†, 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, New Hampshire*. (Poster)

5. **Shreedharan, S.**†, 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.**†, 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.**†, 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.†, **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**.†, 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)