LEI YANG, PhD

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Hopkins Extreme Materials Institute, Johns Hopkins University, Baltimore, MD 21218

Google scholar: https://scholar.google.com/citations?user=2YNd78oAAAAJ&hl=en

EDUCATION

2023 – Present	Postdoctoral Research Fellow, **Johns Hopkins University** | Baltimore, USA
2018 – 2022	Ph.D. Applied Mechanics, **The University of Sydney** | Sydney, Australia
2015 – 2018	M.S. Mining Engineering, **Northeastern University** | Shenyang, China
2011 – 2015	B.S. Mining Engineering, **Northeastern University** | Shenyang, China

Research Interests

- Mechanics of Materials
- Impact dynamics
- Constitutive modelling
- Computational simulation

HONORS & AWARDS

2025	SES Postdoc Travel Award | Society of Engineering Science
2025	MSEE URA Traveling Award | Defense Threat Reduction Agency (DTRA) of United States
2023	Hopkins Extreme Material Institute Postdoctoral Fellowship | Johns Hopkins University
2021	Postgraduate Research Support Scheme | The University of Sydney
2018	Full Scholarship for International PhD students | The University of Sydney
2018	Outstanding thesis award for Postgraduates | Northeastern University (CN)
2017	International tuition fee and stipend scholarships| RMIT University
2017	National scholarship for Postgraduates | Ministry of Education of China
2016	National scholarship for Postgraduates | Ministry of Education of China
2015	Chancellor's scholarship for Postgraduates | Northeastern University (CN)
2015	Outstanding thesis award for Undergraduates | Northeastern University (CN)

REFEREED JOURNAL PUBLICATIONS

(= Corresponding Author, ^ = equal contribution. Google scholar citations=1646, h-index=20, and 2 ESI highly cited papers. Only representative papers are listed*)

[1] **Yang L.,** Lê M., Moreno J., & Ramesh K. T. (2025). Hypervelocity impacts into basalt: time-resolved experiments and mechanism-based simulations. *Journal of Geophysical Research: Planets. (Under Review)*

[2] **Yang L.**, Kuwik B. S., Singh S., Moreno J., Hurley R., & Ramesh K. T. (2025). A mechanism-based constitutive model for competent rocks subjected to impact loading. *Journal of Geophysical Research: Solid Earth,* 130(5), e2024JB031101.

[3] Zare A., Malhotra P., He M., Moreno J., Shaeffer M., **Yang L.**, Frantz C. J., Hemker K.J., Ramesh K.T. (2025). Dynamic failure mechanisms and impact response of microstructurally engineered boron carbide ceramics. *International Journal of Impact Engineering.* (*Under revision*)

[4] Li, L., Kilic, V., Alemohammad, M., **Yang, L.**, Ramesh, K. T., Foster, M. A., & Hufnagel, T. C. (2024). Shack–Hartmann wavefront sensing: A new approach to time-resolved measurement of the stress intensity factor during dynamic fracture. *Mechanics of Materials*, 194, 105010.

[5] **Yang, L.**, Chen B.X. (2024). Extended finite element-based cohesive zone method for modeling simultaneous hydraulic fracture height growth in layered reservoirs. *Journal of Rock Mechanics and Geotechnical Engineering.*

[6] Xiang, J., Qiu, J., Wu, P., Zhang, Q., Song, Y., & **Yang, L***. (2024). Autolytic capsules incorporating alkali-activated slag system for self-healing cementitious composites. *Cement and Concrete Composites*, 147, 105439.

[7] Guo, Z., Qiu, J., Kirichek, A., Zhou, H., Liu, C., & **Yang, L***. (2024). Recycling waste tyre polymer for production of fibre reinforced cemented tailings backfill in green mining. *Science of the Total Environment*, 908, 168320.

[8] Jiang, S., Cheng, Z., **Yang, L.**, & Shen, L. (2023). An auto-tuned hybrid deep learning approach for predicting fracture evolution. *Engineering with Computers*, 39(5), 3353-3370.

[9] Li, Y. M., Zhao, G. F., Jiao, Y., Yan, C., Wang, X., Shen, L., **Yang, L.**, ... & Le, T. (2023). A benchmark study of different numerical methods for predicting rock failure. *International Journal of Rock Mechanics and Mining Sciences*, 166, 105381.

[10] Chilvers, J., **Yang, L.^**, Lin, X., & Zhang, Y. X. (2022). Experimental and numerical investigations of hybrid-fibre engineered cementitious composite panels under contact explosions. *Engineering Structures*, 266, 114582. (Joint first author)

[11] Chen, B., Yang, Y., **Yang, L.**, & Li, W. (2022). Double-machine-learning-based data-driven stochastic flow stress model for aluminium alloys at elevated temperatures. *Materials Today Communications*, *33*, 104506.

[12] **Yang, L.**, Shan Wu, Gao K., & Shen L.M. (2022). Simultaneous propagation of hydraulic fractures from multiple perforation clusters in layered tight reservoirs: non-planar three-dimensional modelling. *Energy*, 124483.

[13] **Yang, L.**, Sharafisafa M., & Shen L.M. (2021). On the fracture mechanism of rock-like materials with interbedded hard-soft layers under Brazilian tests. *Theoretical and Applied Fracture Mechanics*, 116, 103102.

[14] **Yang, L.**, Wang, G., Zhao, G.F., & Shen, L. (2020). A rate-and pressure-dependent damage-plasticity constitutive model for rock. *International Journal of Rock Mechanics and Mining Sciences*, 133, p.104394.

[15] Zhang, S., **Yang, L.***, Ren, F., Qiu, J. and Ding, H. (2020). Rheological and mechanical properties of cemented foam backfill: Effect of mineral admixture type and dosage. *Cement and Concrete Composites*, 112, p.103689.

[16] Qiu, J., Guo, Z., **Yang L.***, Jiang, H., & Zhao, Y. (2020). Effect of tailings fineness on flow, strength, ultrasonic and microstructure characteristics of cemented paste backfill. *Construction and Building Materials*, 263, p.120645.

[17] Wang L, Shao A., Liu X, **Yang L.***, & Ding H.X. (2020). New computational framework for modeling the gravity flow behavior of sublevel caving material. *Computers and Geotechnics*. 125, p.103675.

[18] Jiang, H., Fall, M., Yilmaz, E., Li, Y., & **Yang, L.*** (2020). Effect of mineral admixtures on flow properties of fresh cemented paste backfill: Assessment of time dependency and thixotropy. *Powder Technology*, 372, pp.258-266.

[19] Qiu, J., Guo, Z., **Yang, L.***, Jiang, H., & Zhao, Y. (2020). Effects of packing density and water film thickness on the fluidity behaviour of cemented paste backfill. *Powder Technology*, 359, pp.27-35.

[20] **Yang, L.**, Lin, X., Li, H., & Gravina, R.J. (2019). A new constitutive model for steel fibre reinforced concrete subjected to dynamic loads. *Composite Structures*, 221, p.110849.

[21] **Yang, L.**, Qi, C., Lin, X., Li, J., & Dong, X. (2019). Prediction of dynamic increase factor for steel fibre reinforced concrete using a hybrid artificial intelligence model. *Engineering Structures*, 189, pp.309-318.

[22] **Yang, L.**, Lin, X., & Gravina, R.J. (2018). Evaluation of dynamic increase factor models for steel fibre reinforced concrete. *Construction and Building Materials*, 190, pp.632-644.

[23] Liu, D., Shao, A., Jin, C., & **Yang, L.** (2018). Healing technique for rock cracks based on microbiologically induced calcium carbonate mineralization. *Journal of Materials in Civil Engineering*, 30(11), 04018286.

[24] Qiu, J. P., **Yang, L.**, Xing, J., & Sun, X. G. (2018). Analytical solution for determining the required strength of mine backfill based on its damage constitutive model. Soil Mechanics and Foundation Engineering, 54, 371-376.

[25] **Yang, L.***, Yilmaz, E., Li, J., Liu, H., & Jiang, H. (2018). Effect of superplasticizer type and dosage on fluidity and strength behavior of cemented tailings backfill with different solid contents. *Construction and Building Materials*, 187, 290-298.

BOOK CHAPTERS

[1] **Yang, L.**, Lin X.S. A constitutive model for numerical modelling of steel fibre reinforced concrete, Advances in Engineered Cementitious Composites: Materials, Structures and Numerical Modelling, Edited by Yixia Zhang and Kequan Yu, Published by Elsevier Science on January 1, 2022.

CONFERENCE & INVITED TALKS

[1] **Yang L.**, Lê M., Moreno J., & Ramesh K. T. Hypervelocity impacts into basalt: time-resolved experiments and mechanism-based simulations. SES 2025, Atlanta, Georgia, United States, Oct 12-15, 2025. [Conference presentation]

[2] **Yang, L.** Computational modelling of geomaterials under high velocity impact loading. Materials science in extreme environments Annual Technical Review, Washington D.C., United States, June 25 – 27, 2025. [Conference presentation]

[3] **Yang, L.** A mechanism-based constitutive model for brittle rocks subjected to impact loading. EMI 2025, Anaheim, California, United States, May 27 - 30, 2025. [Conference presentation]

[4] **Yang, L.** Computational modeling of brittle rocks subjected to very high velocity impact. MACH 2025, Annapolis, MD, United States, April 9 -April 11, 2025. [Conference presentation]

[5] **Yang, L.** Computational modelling on sandstone subjected to high velocity impact loading. Materials science in extreme environments Annual Technical Review, Baltimore, MD, United States, June 11 – 13, 2024. [Conference presentation and poster]

[6] **Yang, L.** Contact explosions on hybrid fibre reinforced concrete panels. MACH 2024, Annapolis, MD, United States, April 3 – 5, 2024. [Conference presentation]

[7] **Yang, L.**, Lin, X. Dynamic constitutive model for steel fibre reinforced concrete, East China Jiaotong University, Nanchang, China. Nov 2023. [Invited talk]

[8] **Yang, L.**, Wang, G., Zhao, G.F., & Shen, L. A rate-and pressure-dependent damage-plasticity constitutive model for rock. School of Resource and Civil Engineering, Northeastern University, Shenyang, China. Oct 2023. [Invited talk]

[9] **Yang, L.**, Sharafisafa M., Shen L.M. Numerical investigation on the fracture mechanism of rock-like Brazilian discs with interbedded hard-soft layers. ACAM10: 10th Australasian Congress on Applied Mechanics, Virtual, December 1, 2021. [Conference presentation]

TEACHING EXPERIENCE

08/2024 – 05/2025	**Mechanical & Materials Seminar Course**, Johns Hopkins University [Co-organizer]
08/2019 – 12/2019	**CIVL1802: Statics**, The University of Sydney [Teaching assistant]

MENTORING EXPERIENCE

2023 – Present	Lily Zhao, Graduate student at Johns Hopkins University, USA
2023 – Present	Minh Lê, Graduate student at Johns Hopkins University, USA
2023 – Present	Konrad Muly, Graduate student at Johns Hopkins University, USA
2023 – 2024	Sakshi Braroo, Graduate student at Johns Hopkins University, USA
2020 – 2023	Zhenbang Guo, graduate student at Northeastern University, China
2020 – 2021	Shiyu Zhang, graduate student at Northeastern University, China
2020 – 2021	Qiang Wang, Master student at Northeastern University, China
2019 – 2020	Liancheng Wang, Graduate at Northeastern University, China

INDUSTRY EXPERIENCE

09/2022 – 08/2023	**Senior research and development engineer** & **Project manager**
	Honor (Huawei) | Shenzhen, Guangdong, China
03/2022 – 08/2022	**Senior research and development engineer intern**
	Honor (Huawei)| Shenzhen, Guangdong, China

ACADEMIC SERVICES

- Scientific Committee
  - 7th International Conference on Protective Structures
- Conference mini-symposium organizer
  - Mach 2025
  - EMI 2025
- Journal Reviewer
  - International Journal of Rock Mechanics and Mining Sciences

- Engineering structures
- Engineering Fracture Mechanics
- International Journal of Impact Engineering
- Mechanics of Materials
- Journal of Hazardous Materials
- Journal of Cleaner Production
- Computers and Geotechnics
- Computers and Structures
- Construction and Building Materials
- Powder Technology
- Journal of Rock Mechanics and Geotechnical Engineering
- Journal of Building Engineering
- Structural Engineering and Mechanics
- Advances in Concrete Construction
- Journal of Advanced Concrete Technology
- Journal of Molecular Liquids
- Case studies in construction materials
- ACS Omega
- Journal of Zhejiang University-SCIENCE A

PROFESSIONAL MEMBERSHIPS

- Australian Association for Granular Media
- American Rock Mechanics Association
- International Society for Rock Mechanics
- In-situ Studies of Rock Deformation
- International Association of Protective Structures

ACADEMIC REFERENCES

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