Somdatta Goswami

somdatta_goswami@brown.edu +1-6032860554
https://somdattagoswami.github.io/
218 Waterman Street, Apt.204B, Providence, RI-02906, U.S.A.

Work Experience

2021, Jan – Present **Postdoctoral Research Associate**, Brown University, U.S.A.
(Deep learning, Physics driven machine learning)

2013 – 2017 **Assistant Manager,** Tata Consulting Engineers Limited.

Education

2017 – 2020 **Ph.D.** Bauhaus University Weimar, Germany
Thesis title: *Phase field modeling of fracture with isogeometric analysis and machine learning methods*

2011 – 2013 **M.E. in Structural Engineering** Indian Institute of Engineering Sciences and Technology, India.

2007 – 2011 **B.E. Civil Engineering** Birla Institute of Technology, India.

Research Publications

Preprints

1. Bharali, R., **Goswami**, **S.**, Anitescu, C., & Rabczuk, T. (2021). *A robust monolithic solver for phase-field fracture integrated with fracture energy based arc-length method and under-relaxation.*
2. **Goswami**, **S.**, Yin, M., Yu, Y., & Karniadakis, G. (2021). *A physics-informed variational deeponet for predicting the crack path in brittle materials.*
3. Lu, L., Meng, X., Cai, S., Mao, Z., **Goswami**, **S.**, Zhang, Z., & Karniadakis, G. E. (2021). *A comprehensive and fair comparison of two neural operators (with practical extensions) based on fair data.*

Journal Articles

1. Chatterjee, T., Chakraborty, S., **Goswami**, **S.**, Adhikari, S., & Friswell, M. I. (2021). Robust topological designs for extreme metamaterial micro-structures. *Scientific Reports*, *11*(1), 1–14.
2. **Goswami**, **S.**, Anitescu, C., Chakraborty, S., & Rabczuk, T. (2020). Transfer learning enhanced physics informed neural network for phase-field modeling of fracture. *Theoretical and Applied Fracture Mechanics*, *106*, 102447.
3. **Goswami**, **S.**, Anitescu, C., & Rabczuk, T. (2020a). Adaptive fourth-order phase field analysis for brittle fracture. *Computer Methods in Applied Mechanics and Engineering*, *361*, 112808.
4. **Goswami**, **S.**, Anitescu, C., & Rabczuk, T. (2020b). Adaptive fourth-order phase field analysis using deep energy minimization. *Theoretical and Applied Fracture Mechanics*, 102527.

5. Samaniego, E., Anitescu, C., **Goswami**, **S.**, Nguyen-Thanh, V., Guo, H., Hamdia, K., … Rabczuk, T. (2020). An energy approach to the solution of partial differential equations in computational mechanics via machine learning: Concepts, implementation and applications. *Computer Methods in Applied Mechanics and Engineering*, *362*, 112790.

6. **Goswami**, **S.**, Anitescu, C., & Rabczuk, T. (2019). Adaptive phase field analysis with dual hierarchical meshes for brittle fracture. *Engineering Fracture Mechanics*, *218*, 106608.

7. **Goswami**, **S.**, Chakraborty, S., Chowdhury, R., & Rabczuk, T. (2019). Threshold shift method for reliability-based design optimization. *Structural and Multidisciplinary Optimization*, *60*(5), 2053–2072.

8. **Goswami**, **S.**, Chakraborty, S., & Rabczuk, T. (2019). A surrogate assisted adaptive framework for robust topology optimization. *Computer Methods in Applied Mechanics and Engineering*, *346*, 63–84.

9. **Goswami**, **S.**, Ghosh, S., & Chakraborty, S. (2016). Reliability analysis of structures by iterative improved response surface method. *Structural Safety*, *60*, 56–66.

Conference Proceedings

1. **Goswami**, **S.**, Anitescu, C., & Rabczuk, T. (n.d.). "topology optimization under uncertainty", structural engineering convention. In *Structural Engineering Convention 2018*.

2. **Goswami**, **S.**, & Chakraborty, S. (n.d.). An efficient framework for fracture analysis of brittle materials. In *Structural Engineering Convention 2018*.

3. **Goswami**, **S.**, & Chakraborty, S. (2014). Adaptive response surface method based efficient monte carlo simulation. In *Vulnerability, Uncertainty, and Risk: Quantification, Mitigation, and Management* (pp. 2043–2052).

4. **Goswami**, **S.**, Chakraborty, S., & Ghosh, S. (2013). Adaptive response surface method in structural response approximation under uncertainty. In *International Conference on Structural Engineering and Mechanics* (pp. 194–202).

Awards and Achievements

2021 **XSEDE startup grant for developing multi-scale codes.**
CIS210111: Surrogate modeling for multiscale fracture analysis using DeepONets.

2020 **INSPIRE Faculty Fellowship, Department of Science and Technology, India**.

2018 **Best Paper Award in the Reliability and Optimization category at the Structural Engineering Convention 2018, Kolkata, India**

2017 **DAAD Fellowship for pursuing Ph.D. at Bauhaus University Weimar, Germany.**

2011 **MHRD scholarship for pursuing Master's degree at Indian Institute of Engineering Sciences and Technology, Shibpur, India.**

References

Dr. George Karniadakis
Professor
Applied Mathematics Department
Brown University, U.S.A.
george_karniadakis@brown.edu

Dr. Timon Rabczuk
Professor
Civil Engineering Department
Bauhaus University-Weimar,
Germany.
timon.rabczuk@uni-weimar.de

Dr. Subrata Chakraborty
Professor
Civil Engineering Department
Indian Institute of Engineering Sciences & Technology, India.
schak@civil.iiests.ac.in