

Ghazanfar Ali ANWAR (PhD, Dr., Ing.)

Postdoctoral Fellow, CAiRS, The Hong Kong Polytechnic University

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[Google Scholar](#) [ResearchGate](#) [ORCID](#) [LinkedIn](#) [Twitter](#) [Facebook](#)



RESEARCH INTERESTS

Reliability, *Risk*, Resilience, *Sustainability*, Extreme Events, *Deterioration*, Inspection, *Maintenance*, Structural Health Monitoring, *Life-cycle Management*, Decision Making, *Artificial Intelligence*, Deep Reinforcement learning, *Evolutionary Optimization*, Digital Twin.

TEACHING INTERESTS

Numerical Methods, *Probability & Statistics*, Civil Engineering Materials, *Engineering Mechanics*, Dynamics of Structure, *Mechanics of Solids*, Mechanics of Materials, *Structural Analysis*, Plain & Reinforced Concrete, *Steel Structures*, Design of Concrete Structures, *Design of Steel Structures*, Bridge Engineering, *Earthquake Engineering*, Artificial Intelligence, *Life-cycle Management of Infrastructure systems*.

EDUCATION

Postdoctoral Fellow, CAiRS

Feb 2023 - Present

The Hong Kong Polytechnic University, Hong Kong
University of Maryland, Maryland, United States

PhD in Civil and Environmental Engineering

Sept 2018 - Dec 2022

The Hong Kong Polytechnic University, Hong Kong

MSc in Civil Engineering

Sept 2015 - Feb 2017

Czech Technical University in Prague, Czechia

University of Coimbra, Portugal

Politehnica University of Timișoara, Romania

BE Civil Engineering

Aug 2009 - Jan 2014

National University of Sciences and Technology (NUST), Islamabad, Pakistan

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow, Centre for Advances in Reliability and Safety

Feb 2023 - Present

Research Assistant, The Hong Kong Polytechnic University

Sep 2021 - Dec 2022

Research Assistant, United Arab Emirates University

Oct 2017 - May 2018

Lecturer, Capital University of Science & Technology

May 2017 - Aug 2017

Site Engineer, Frontier Works Organization

Aug 2014 - Aug 2015

Junior Design Engineer, Civil Engineering Consulting

May 2014 - July 2014

Junior Engineer, Associates in Development

July 2013 - April 2014

Site Engineer, Frontier Works Organization

July 2012 - Aug 2012

Site Engineer, Associated Consultancy Centre

July 2011 - Aug 2011

SELECTED HONORS and AWARDS

- **Postdoctoral, ITF *most prestigious***, fully funded, Hong Kong, 2023-2025
- **Doctoral, HKPFS *most prestigious***, fully funded, Hong Kong, 2018-2021
- **Masters, ERASMUS MUNDUS *most prestigious***, fully funded, European Union, 2015-2017
- **Bachelors, First-Class merit scholarship *most prestigious*** NUST, Pakistan, 2009-2013
- CNERC Young Researcher Merit Award, CNERC Annual Technical Symposium 2020
- Authored more than 30 peer-reviewed articles, conferences, and book chapters, 2013 to date.
- Reviewed more than 50 peer-reviewed articles, 2013 to date.
- More than decade of industry, teaching, and research experience, 2013 to date.

TEACHING PROJECTS

ME-107 Engineering Mechanics at (Udemy, website Link)	2023
CSE20308 Construction Materials at (Polyu.edu.hk)	2021
CSE501 Bridge Engineering at (Polyu.edu.hk)	2019
CIVL510 Special Topics in Structural Engineering at (uae.ac.ae)	2018
CE-2423 Structural Analysis-I at (cust.edu.pk)	2017
CE-2891 Construction Engineering at (cust.edu.pk)	2017

PROFESSIONAL PROJECTS

Anomaly detection for the Steel Wire Ropes	2024
Health, degradation, and aging mechanisms of tower crane system	2023
Smart inspection maintenance solutions for aging buildings	2022
InsurTech Innovation: Catastrophe Modeling for Insurer Solutions	2021
Seismic performance and resilience of steel buildings by using high strength steel	2020
Construction supervision of the Motorway from Islamabad to Lahore	2015
Design and Construction Supervision of AiD six-story Plaza	2014
Design of Institute of Nursing and Medical Technology at KMU Peshawar	2013
Supervision of Establishment of Police Joint Elite Training Center Hakimabad	2013
Site Supervision of Islamabad International Airport Pakistan	2012
Supervision of Kashmir major east-west highway in Islamabad	2011

JOURNAL REVIEWER

50+ journal papers reviewed including Nature, Scientific Reports, Advances in Structural Engineering, Applied Sciences, Buildings, Energies, International Journal of Environmental Research and Public Health, Machines, Remote Sensing, Sustainability, Structure and Infrastructure Engineering, and others. ([link: https://orcid.org/0000-0001-9149-2749](https://orcid.org/0000-0001-9149-2749))

PROFESSIONAL SKILLS

Python, MATLAB, Microsoft Office Suite, OpenSEES, ETABS, SAP2000, SAFE, CSiBridge, Perform 3D, AutoCAD, STAAD Pro, SeismoStruct, ABAQUS, R, ArcGIS, ABAQUS, Artificial Intelligence, among others.

COMMUNICATION SKILLS

- English (IELTS Listening=8, Reading=7, Writing=6.5, Speaking=8.5, **Overall = 7.5**)
- Urdu (Fluent), Hindi (Fluent), Punjabi (Fluent)

Journal Publications

1. **Anwar, G.A.***, Akber, M.Z., Ahmed, H.A., Hussain, M.,... (2024), "Life-Cycle Performance Modeling for Sustainable and Resilient Structures under Structural Degradation: A Systematic Review." *Buildings*, 14, 3053. <https://doi.org/10.3390/buildings14103053> (JIF Q2, IF 3.1)
2. Akber, M.Z.*; Chan, W.-K.; Lee, H.-H.; **Anwar, G.A.** (2024), "TPE-Optimized DNN with Attention Mechanism for Prediction of Tower Crane Payload Moving Conditions." *Mathematics*, 12, 3006. <https://doi.org/10.3390/math12193006> (JIF Q1, IF 2.3)
3. **Anwar, G. A.**, and X. Zhang.* (2024), "Deep reinforcement learning for intelligent risk optimization of buildings under hazard". *Reliability Engineering and System Safety*, 247, 110118. <https://doi.org/10.1016/j.res.2024.110118> (JIF Q1, IF 8.1)
4. **Anwar, G. A.*** (2024), "Life-cycle performance enhancement of deteriorating buildings under recurrent seismic hazards". *Soil Dynamics and Earthquake Engineering*, 180, 108600. <https://doi.org/10.1016/j.soildyn.2024.108600> (JIF Q1, IF 4.0)
5. **Anwar, G. A.**, Dong, Y.*, and Ouyang, M. (2023), "Systems thinking approach to community buildings resilience considering utility networks, interactions, and access to essential facilities". *Bulletin of Earthquake Engineering*, 21, 633–661. <https://doi.org/10.1007/s10518-022-01557-y> (JIF Q1, IF 4.6)
6. **Anwar, G. A.**, Dong, Y.*, and Khan, M.A.,. (2023), "Long-term sustainability and resilience enhancement of building portfolios". *Resilient Cities and Structures*. <https://doi.org/10.1016/j.rcns.2023.06.002> (JIF TBD, IF TBD)
7. **Anwar, G. A.***, Hussain, M., Akber, M. Z., Khan, M.A., and Khan, A. A (2023), "Sustainability-oriented optimization and decision-making of community buildings under seismic hazard". *Sustainability*, 15(5), 4385. <https://doi.org/10.3390/su15054385> (JIF Q2, IF 3.9)
8. **Anwar, G. A.**, and Dong, Y.* (2022), "Multi-objective surrogate-based optimization and decision-making of community building portfolios under uncertain consequences and risk attitudes". *Engineering Structures*, 114749. <https://doi.org/10.1016/j.engstruct.2022.114749> (JIF Q1, IF 5.5)
9. Zhou, Z., **Anwar, G. A.***, and Dong, Y.,. (2022), "Performance-based bi-objective retrofit optimization of building portfolios considering uncertainties and environmental impacts". *Buildings*, 12, 85. <https://doi.org/10.3390/buildings12010085> (JIF Q2, IF 3.8)
10. Anwar, J., Khan, M., Farooq, M. U., Khan, T. F., **Anwar, G. A.**, Qadeer, A., ... & Subhani, T. (2022), Effect of B4C and CNTs' nanoparticle reinforcement on the mechanical and corrosion properties in rolled Al 5083 friction stir welds. *Canadian Metallurgical Quarterly*, 1-10. <https://doi.org/10.1080/00084433.2022.2054586> (JIF Q3, IF 0.9)
11. Khan, M. A., Khan, A. A.*, **Anwar, G. A.**, Usmani, A. (2021), "Framework for fire risk assessment of bridges." *Structures*, 33, 523-532. <https://doi.org/10.1016/j.istruc.2021.04.071> (JIF Q2, IF 4.1)
12. **Anwar, G. A.**, Dong, Y.*, and Li, Y. (2020), "Performance-based decision-making of buildings under seismic hazard considering long-term loss, sustainability, and resilience." *Structure and Infrastructure Engineering*, 17 (4), 454-470. <https://doi.org/10.1080/15732479.2020.1845751> (JIF Q2, IF 3.7)

13. **Anwar, G. A.**, and Dong, Y.* (2020), "Seismic resilience of retrofitted RC buildings." *Earthquake Engineering and Engineering Vibration*, 19(3), 561-571. <https://doi.org/10.1007/s11803-020-0580-z> (JIF Q2, IF 2.8)
14. **Anwar, G. A.**, Dong, Y.,* and Zhai, C., (2020), "Performance-based probabilistic framework for seismic risk, resilience, and sustainability assessment of reinforced concrete structures." *Advances in Structural Engineering*, 1454-1472. <https://doi.org/10.1177/1369433219895363> (JIF Q2, IF 2.8)
15. Zheng, Y., Dong, Y.*, Chen, B., and **Anwar, G. A.** (2019), "Seismic damage mitigation of bridges with self-adaptive SMA-cable-based bearings." *Smart Structures and Systems*, 24(1), 127-139. <https://doi.org/10.12989/sss.2019.24.1.127> (JIF Q1, IF 3.5)
16. **Anwar, G. A.***, Dinu, F., and Ahmed, M. (2019), "Numerical Study on Ultimate Deformation and Resistance Capacity of Bolted T-Stub Connection." *International Journal of Steel Structures*, 19 (3), 970-977. <https://doi.org/10.1007/s13296-018-0186-8> (JIF Q3, IF 1.5)

Conference Publications

17. **Anwar, G.A.**, and Khan, Y. (2024). "A review on fire damage assessment of reinforced concrete structures of a building" *6th Conference on Sustainability in Civil Engineering*, Capital University of Science and Technology, Islamabad, Pakistan, 01 August 2024. [Link](#)
18. Khan, M.A., Khan, A.A., Zhuojun, N., **Anwar, G.A.**, Cashell, K.A., Usmani, A. (2024). "Deep learning for realistic fire response analysis of composite bridges." *13th International Conference on Structures in Fire*, University of Coimbra, Portugal, 19 to 21 June 2024. [Link](#)
19. **Anwar, G. A.**, and Dong, Y. (2022). "Probabilistic building portfolio recovery modelling under macroeconomic conditions." *13th International Conference on Structural Safety & Reliability ICOSSAR 2021-2022*, Tongji University, Shanghai, China, 13-17 September 2022. [Link](#)
20. **Anwar, G. A.**, and Dong, Y. (2022). "Gaussian process-based optimization framework for community building portfolios considering resilience and sustainability objectives." *The International Symposium on Reliability Engineering and Risk Management (ISRERM)*, Hannover, Germany, 4-7 September 2022. [Link](#)
21. **Anwar, G. A.**, and Dong, Y. (2020). "Restoration modelling of Water Network under seismic hazard: Role of Electrical and Power Network." *5th International Conference on Civil, Structural and Transportation Engineering (ICCSTE'20)*, Niagara Falls, Canada. 12-14 November, 2020. [Link](#)
22. **Anwar, G. A.**, and Dong, Y. (2019), "Economic Loss Evaluation Comparing Component and System-Level Fragility Assessment Methods." *First Eurasian Conference on OpenSEES Hong Kong*, Hong Kong, China, 20-21 June, 2019. [Link](#)
23. **Anwar, G. A.**, and Mwafy, A. (2018), "Impact of local retrofit in improving lateral capacity." *UAE 4th Graduate Students Research Conference, American University of Sharjah, Sharjah, UAE*. 21 April, 2018. [Link](#)
24. **Anwar, G. A.**, and Dinu, F. (2018), "Parametric Study on ultimate deformation and capacity of Extended bolted T-stub connections." *UAE 4th Graduate Students Research Conference, American University of Sharjah, Sharjah, UAE*. 21 April, 2018. [Link](#)

25. **Anwar**, G. A., Khan, S. A., and Ali, M. (2017), "Earthquake Risk Assessment using PSHA in ArcGIS for developing countries - An easy and quick approach." *Australian Earthquake Engineering Society AEES Conference*, Canberra, Australia, 24-26 November 2017. [Link](#)

Conference Abstracts

26. **Anwar**, G. A., and Dong, Y. (2021). Socio-economic and environmental constraints-based community resilience assessment. *Engineering Mechanics Institute Conference/ Probabilistic Mechanics and Reliability Conference*, Columbia University, New York City, United States, 25-28 May 2021. [Link](#)
27. **Anwar**, G. A., and Mwafy, A. (2018), "Effectiveness of seismic mitigation approaches for improving the performance of buildings with varying heights." *UAEU Annual Research and Innovation Conference*, Al-Ain, UAE. 5-6 February, 2018. [Link](#)

Book Chapters

28. **Anwar**, G. A., and Dong, Y., and Frangopol, D. M., (2023) "Life-cycle Analysis considering Reliability, Risk, Resilience, and Sustainability". *Seventh Chapter of a Book. (submitted 01-2023)*
29. **Anwar**, G. A., and Dong, Y., and Frangopol, D. M., (2022) "Resilience and Sustainability". *Fifth Chapter of a Book. (submitted 06-2022, revised 07-2022)*
30. **Anwar**, G. A., and Dong, Y., and Frangopol, D. M., (2020) "Performance-Based Engineering". *Second Chapter of a Book. (submitted 08-2020, revised 10-2020)*

Thesis/Dissertation

31. **Anwar**, G. A. (2022), "Resilience-based seismic performance of individual buildings and community portfolios". *Hong Kong Polytechnic University*. Doctoral Thesis. [Link](#)
32. **Anwar**, G. A. (2017), "Ultimate deformation and resistance capacity of bolted T-stub connections under different loading conditions". *Czech Technical University, Prague and Universitatea Politehnica Timisoara*. Masters Thesis. [Link](#)
33. **Anwar**, G. A. (2013), "Seismic analysis of reinforced concrete structures in Pakistan". *National University of Science & Technology*. Bachelors Thesis. [Link](#)