

RIYA CATHERINE GEORGE

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IIT Kanpur Campus,
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EDUCATION

PhD	Indian Institute of Technology Kanpur, Civil Engineering,	March 2018
MTech	Indian Institute of Technology Kanpur, Civil Engineering	September 2007
BTech	National Institute of Technology Calicut, Civil Engineering	May 2004

WORK EXPERIENCE

Assistant Professor (tenure track), Civil and Environmental Engineering Department
Hiroshima University, Hiroshima, Japan December 2018 to November 2023

Project post-doctoral fellow, IIT Kanpur June to November 2018

Engineer, GE Aviation
GE India Technology Centre, Bangalore, India September 2007 to June 2011

Intern
CSIR-Structural Engineering Research Centre, Chennai, India July 2004 to June 2005

TEACHING

Instructor

- Experiments in civil and environmental engineering
 - Undergraduate course, Hiroshima University, (Co-instructor, second term 2019-2023)
- Exercise of Technical English
 - Undergraduate course, Hiroshima University, (Main instructor, second term 2021-2023)
- Management of natural disasters
 - Graduate course, Hiroshima University (Co-instructor, fourth Term, 2021-2023)
- Design of Infrastructure
 - Undergraduate course, Hiroshima University, (Co-instructor, third term 2022,2023)

Tutor, Civil Engineering, IIT Kanpur

- Engineering graphics
- Mechanics of Solids

Teaching Assistant, Civil Engineering, IIT Kanpur

- Mechanics of solids, Structural dynamics, Design of RCC structures, Design of Steel structures, Analysis of plates and shells, Engineering graphics

ACADEMIC GUIDANCE

- Master's thesis
 - Tomoya Uenaga, "Natural hazards resilience enhancement of highway bridges", Hiroshima University, 2022 (co-supervisor, completed)
 - Nakamura Kohei, "Damage assessment in structures using simultaneous combination of Frequency Response Function data, Principal Component Analysis, and Enhanced Colliding Bodies Optimization algorithm", Hiroshima University, 2023 (co-supervisor, completed)
- Bachelor's thesis
 - Mihoko, Sasaki, "Forced vibration finite element analysis of a cracked beam with arbitrary number of cracks subject to a concentrated moving load", 2019 (co-supervisor, completed)

PUBLICATIONS

Journal Publications

1. Sarkar, K., Gupta, V.K., and **George, R.C.**, "Wavelet based generation of spatially correlated accelerograms," *Soil Dynamics and Earthquake Engineering*, Vol. 87, 2016, 116-124.
2. Paul, B., **George, R.C.**, and Mishra, S.K., "Phase Space Interrogation of the Empirical Response Modes for Seismically Excited Structures," *Mechanical Systems and Signal Processing*, Vol 91, 2017, 250-265
3. **George, R.C.**, and Mishra, S.K., "Structural Interrogation using Phase Space Topology of the Wind Induced Vibrations," *Journal of Vibration Control*, 2017, 107754631770166
4. **George, R.C.**, Mishra, S.K., and Dwivedi, M., "Mahalanobis distance among the phase portraits as damage feature", *Structural Health Monitoring*, 2018
5. Sang, N. T., Quan, T., M., Dang, V. Q., Ho, L.S., and **George, R.C.**, "Applicability of concrete containing the binary and ternary system of binder materials under natural marine environment", *Journal of Applied Science and Engineering*, 2021, [http://dx.doi.org/10.6180/jase.202210_25\(5\).0019](http://dx.doi.org/10.6180/jase.202210_25(5).0019).
6. Tran V.Q, Loi, G. V., Phien V.D., **George, R. C.**, and Ho, L.S., "Application of Machine Learning Technique for Predicting and Evaluating Chloride Ingress in Concrete", *Frontiers of Structural and Civil Engineering*, 2022. DOI:10.1007/s11709-022-0830-4
7. Sonkar, S., Kumar, P., **George, R. C***, Philip, D., and Ghosh, A. K., "Detection and Estimation of Natural gas Leakage using UAV by machine learning Algorithms", *IEEE Sensors Journal*, 2022. (*Corresponding Author) DOI: 10.1109/JSEN.2022.3157872

8. Sonkar, S., Kumar, P., **George, R. C***, Yuvaraj, T., Philip, D. and Ghosh, A. K., "Real-Time Object Detection and Recognition Using Fixed-wing LALE VTOL UAV," IEEE Sensors Journal, 2022, (***Corresponding Author**) DOI: 10.1109/JSEN.2022.3206345
9. Uenaga, T., Omidian, P., **George, R. C.**, Mirzajani, M., and Khaji, N., "Seismic resilience assessment of curved reinforced concrete bridge piers through seismic fragility curves considering long-period earthquakes", Sustainability, 2023. <https://doi.org/10.3390/su15107764>
10. Sonkar, S., Kumar, P., **George, R. C***, Yuvaraj, T., Philip, D. and Ghosh, A. K., "Design & Implementation of an Electric Fixed-wing Hybrid VTOL UAV for Asset Monitoring", Journal of Aerospace Technology and Management, 2023 (***Corresponding Author**)
11. Kumar, P., Sonkar, S., **George, R. C.**, Ghosh, A.K., and Philip, D., "Data-Driven Approach for Estimating Longitudinal Aerodynamic Parameters using Neural Artificial Bee Colony Fusion Algorithm", Asian Journal of Control, 2023.
12. Kumar, P., Sonkar, S., **George, R. C***, Ghosh, A.K., and Philip, D., "Estimation of Aerodynamic Parameters Using Neural Artificial Bee Colony Fusion Algorithm for Moderate Angle of Attack using Real Flight Data", Proceedings of the Institution of Mechanical Engineering Part G: Journal of Aerospace Engineering, 2023 (***Corresponding Author**)

Conference Publications

1. Aakash Gupta, George, R.C, Sudib K Mishra and Suparno Mukhopadhyay. "Damage detection of railway bridges using phase space interrogation", ISSS National Conference on MEMS, Smart Materials, Structures and Systems, Kanpur, India, 2016.
2. Riya C George, Johanna Posey, Aakash Gupta, Suparno Mukhopadhyay, and Sudib K. Mishra, "Damage Detection in Railway Bridges Under Moving Train Load", International Modal Analysis Conference, Society of Experimental Mechanics 2017.
3. Riya C. George, Aakash Gupta, Johanna Posey, Suparno Mukhopadhyay, and Sudib K Mishra, "Railway bridge health monitoring using train load induced vibrations", International Conference on Structural Safety and Reliability, 2017.
4. George, R.C. "A machine learning approach for damage identification of bridges using operational vibration responses". 10th International conference on bridge maintenance, safety and management, 2021.
5. Gupta, S., George, R.C., Philip, D., and Nair, S. "Activity time variations and its influence on realizations of different critical paths in a pert network: an empirical study using simulations" Proceedings of the 2nd International Civil Engineering and Architectural Conference, Singapore, 2022.
6. Inoue, Y., Ogawa, Y., Kawai, K., George, R. C., "Carbonation resistance of Portland blast furnace slag cement type B concrete internally cured by using roof-tile waste aggregate", 17th East Asia-Pacific Conference on Structural Engineering and Construction, 2022.
7. Nakada, T., Ogawa, Y., Kawai, K., George, R. C., "Effects of Various Ions in Seawater on Chloride Ion Behavior in Mortar using Ground Granulated Blast-Furnace Slag", 17th East Asia-Pacific Conference on Structural Engineering and Construction,

- 2022.
8. Kumar, P., Sonkar, S., George, R. C., Ghosh, A.K., and Philip, D., “Longitudinal Aerodynamic Parameters Estimation using Machine Learning with Neuro Artificial Bee Colony Fusion Algorithm (NABC),” 13th Asian Control Conference (ASCC), 2022, pp. 500–505, doi:10.23919/ASCC56756.2022.9828108.
 9. Nakamura, T., Aoki, T., George, R. C., Ogawa, Y., and Kawai, K., “Applicability of Electrical Resistance Method for Water Absorption Test on Cement Paste Using Mineral Admixture” Third international conference on Sustainable Civil Engineering and Architecture, 2023.
 10. Zhang, Y., Ogawa, Y., George, R. C., and Kawai, K., “Optimizing the Compression Properties Improvements of Non-proprietary Ultra-high-performance Concrete”, Third international conference on Sustainable Civil Engineering and Architecture, 2023.
 11. Zhang, Y., Ogawa, Y., George, R. C., and Kawai, K., “Optimizing the Effects of Mineral Admixtures and Curing Regimes on Sustainable Non-proprietary UHPC”, 77th RILEM Week, 2023.

RESEARCH GRANTS

Research grants awarded

- Start-Up grant: ¥5,000,000 (Dec 2018)
 - Funding agency: HIRAKU consortium, Japan
 - Role: Principal Investigator
 - Description of tasks: The research fund was used to set up initial research infrastructure of my research in structural health monitoring. Relevant software for finite element analyses, accelerometers, displacement sensors, data collection devices and materials for experiments were procured.
- Recurring travel and expenses grant for 5 years: ¥500,000/year (2018-2022)
 - Funding agency: HIRAKU consortium, Japan
 - Role: Principal Investigator
- Field research on technical feasibility of commercially viable extraction of Catechin from old tea plants
 - Funding Agency: INDCOSERVE Authority of India, Ministry of Road Transport and Highways, Government of India
 - Total project cost: Rs: 2 crores, (ongoing)
 - Role: Co-Investigator

AWARDS AND RECOGNITIONS

Lean Six Sigma Green Belt Certification, General Electric, December 2008

Selected for Edison Engineering Development Program, at General Electric, 2009

OUTREACH

- Reviewer Services
Reviewed original manuscripts for the following journals: International Journal of Critical Infrastructures (1), IEEE sensors (1), IEEE Systems (1), Measurement (1), Nature Scientific reports (1), Journal of Science and Transport Technology (1), Journal of Vibration and Control (1).

- Knowledge dissemination
Taught a 4-week NPTEL MOOC- Structural dynamics for civil engineers (SDOF systems)
 - August – September 2019
 - Content: Introduction to structural dynamics, components of dynamic system, single degree of freedom systems, free vibration, forced vibrations.
 - Number of registered students: ~ 2000
 - Number of students in the exam ~ 200