PRANAVESH PANAKKAL

Department of Civil and Environmental Engineering, Rice University
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ACADEMIC APPOINTMENTS

Postdoctoral Associate

2023 - Present, Rice University, Houston, TX
Department of Civil and Environmental Engineering
Host: Dr. Jamie Ellen Padgett

Research Associate

2016 - 2017, IIT Bombay, India
Department of Civil and Environmental Engineering
Host: Dr. Ravi Sinha

EDUCATION

Ph.D. in Civil & Environmental Engineering

2017 - 2022, Rice University, Houston, TX
Department of Civil and Environmental Engineering
Cumulative GPA: 4.0/4.0, Ph.D. awarded in December 2022
Thesis: Situational awareness frameworks for real-time sensing of flood impacts on road transportation networks
Advisor: Dr. Jamie Ellen Padgett

Master of Technology in Structural Engineering

2012 - 2014, IIT Bombay, Mumbai, India
Department of Civil Engineering
Cumulative GPA: 9.81/10
Thesis: Vulnerability & Exposure Modeling in GIS-based Seismic Risk Assessment
Advisor: Dr. Ravi Sinha

Bachelor of Technology in Civil Engineering

2006 - 2010, University of Calicut, India
Government Engineering College Kozhikode
Department of Civil Engineering

INDUSTRY APPOINTMENTS

Graduate Engineer

2014 - 2016, Walter P. Moore, Pune, India
Structural Engineer
Select projects: Mercedes-Benz Stadium, Atlanta; Arthur Ashe Stadium, New York; BMO Field Stadium, Toronto; Large Scale Themed Entertainment Project, Florida.

PUBLICATIONS

Under Review

Panakkal, P. & Padgett, J.E., (nd). *More Eyes on the Road: Sensing Flooded Roads by Fusing Real-Time Observations from Public Data Sources.* Submitted to Reliability Engineering & System Safety

Preprints

Liu, Y., Panakkal, P., Dee, S., Balakrishnan, G., Padgett, J. and Veeraraghavan, A., (2023). *ISLAND: Informing Brightness and Surface Temperature Through a Land Cover-based Interpolator.* arXiv preprint arXiv:2309.12416., Submitted to Remote Sensing of Environment

Journal Publications

Panakkal, P., Wyderka, A.M., Padgett, J.E. and Bedient, P.B., (2023). *Safer this way: Identifying flooded roads for facilitating mobility during floods.* Journal of Hydrology, 625, p.130100.

Panakkal, P., Fattoracci, E.S., Padgett, J.E., King, D.D. and Yoo, T., (2023). *Sensing flooded roads to support roadway mobility during flooding: a web-based tool*

and insights from needs assessment interviews. Natural hazards review, 24(4), p.04023039.

Gori, A., Gidaris, I., Elliott, J.R., Padgett, J., Loughran, K., Bedient, P., Panakkal, P. and Juan, A., (2020). *Accessibility and recovery assessment of Houston's roadway network due to fluvial flooding during Hurricane Harvey.* Natural hazards review, (2), p.04020005.

Conference Proceedings & Presentations

Price, A., Panakkal, P., Padgett, J., & Bedient, P. B. (2021, December). *Real-Time Urban Flood Mapping for Facilitating Emergency Response Situational Awareness.* In AGU Fall Meeting 2021. AGU.

Panakkal, P., Padgett, J.E. and Bedient, P., 2022, January. *Risk-Informed Decision-Making Framework for Emergency Response During Flooding.* In 13th International Conference on Structural Safety & Reliability.

Panakkal, P., & Padgett, J. (2021). *Toward Smart Resilience: Smart Systems for Situational Awareness of Flood Impacts and Transportation Access (SSSAFT) in Communities*, EMI-PMC: Engineering Mechanics Institute Conference and Probabilistic Mechanics and Reliability Conference, Virtual.

Panakkal, P., Juan, A., Garcia, M., Padgett, J.E. and Bedient, P., 2019, April. *Towards Enhanced Response: Integration of a Flood Alert System with Road Infrastructure Performance Models.* In Structures Congress 2019: Buildings and Natural Disasters (pp. 294-305). Reston, VA: American Society of Civil Engineers.

Gidaris, I., Gori, A., Panakkal, P., Padgett, J.E. and Bedient, P. (2017). *Accessibility assessment of Houston's roadway network through integration of observed flood impacts and hydrologic modeling,* 2017 American Geophysical Union Fall Meeting, December 11-15, 2017.

Book Chapters

Padgett, J.E., Panakkal, P. and González-Dueñas, C., (2022). *Infrastructure impacts and vulnerability to coastal flood events.* In Coastal Flood Risk Reduction (pp. 151-165). Elsevier.

Tools

Panakkal, P., Wyderka A. M., Padgett, J.E., and Bedient, P. B. (2021). *OpenSafe Mobility.* www.opensafemobility.com
Description: A real-time situational awareness tool to sense link- and network-level impacts of roadway flooding using physics-based rainfall-runoff model and radar data. Operational since Sept. 2018.

Panakkal, P.and Padgett, J.E. (2022). *OpenSafe Fusion.* www.opensafefusion.com
Description: A tool to sense flooded data by fusing observations from multiple data sources. A version of this tool is currently undergoing scenario immersion testing in Houston.

Datasets

Padgett, J., Balomenos, G., Gidaris, I., Ebad Sichani, M., Vishnu, N., Du, A., Bernier, C., Misra, S., Kameshwar, S. and Panakkal, P., (2018). *Post-Harvey Houston-Galveston roadway bridge reconnaissance.*

Liu, Y., Panakkal, P., Dee, S., Balakrishnan, G., Padgett, J., Veeraraghavan. A., (2023) *ISLAND: Informing Brightness and Surface Temperature Through a Land Cover based Interpolator.* DesignSafe-CI. https://doi.org/10.17603/ds2-3rf5-sd58 v1

Non-Refereed Workshops

Acosta, D., R. Negri, B. Tahmasbi, L. Waters, D. Abbasi, P. Panakkal. (2023) *DesignSafe Academy Project: Identifying Social Disparities in the Use of Reporting Systems During Natural Hazards---A Houston Case Study.* DesignSafe-CI. https://doi.org/10.17603/ds2-44cm-n486 v1

TEACHING EXPERIENCE

Teaching Assistant
Gulf Scholar Program, Fall Seminar Series, Fall 2023
CEVE 560 - Bridge Engineering and Extreme Events, Spring 2021

Guest Lecturer
CEVE 560 - Bridge Engineering and Extreme Events, Fall 2023
CEVE 562 - Infrastructure Resilience to Multiple Hazards, Spring 2022

MENTORING

Undergraduate research
Johnathan Roberts, computer vision, Fall 2020
Aidan Weindel, social sensors, Fall 2021
Misbaou Bah, data equity, Fall 2021,
Allison Wyderka, probabilistic flood hazard, Fall 2022

SERVICE AND OUTREACH

Journal Reviews
Natural Hazards Review
Risk Analysis
International Journal of Disaster Risk Reduction
Sustainable and Resilient Infrastructure

Panel Discussion
Bridging Diverse Knowledge Systems to Address Flood Risk in Northeast Houston Communities, National Academies of Sciences, Engineering, and Medicine, 26-27 April 2023

November 14, 2023