

Thesis Portfolio

Flood Monitoring and Mitigation Strategies for Flood-Prone Urban Areas
(Technical Report)

Rising Flood Levels and Affordable Housing: An Analysis of Mitigation Strategies using Actor Network Theory
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

Kruti Shah
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Department of Systems and Information Engineering

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Sociotechnical Synthesis

My thesis portfolio revolves around how cities are adapting to increased flooding due to climate change. My technical report suggests a methodology for cities that are looking to learn more about how flooding is distributed locally. Currently, cities largely rely on residents to report local flooding. This removes objectivity and creates a burden on citizens to know exactly who to call when reporting their problem. In addition, any existing flood mapping resources used, like ArcGIS, may not be updated with how flooding occurs during increased rainfall scenarios. The goal of my team was to provide cities with a framework for how to update and reintroduce objectivity to their flood management system. We built a sensor system that uses long-range radio to communicate flood levels with a database. We also came up with a methodology for updating maps in ArcGIS to include details such as broken stormwater pipes and unexpected outflows, among other things.

My STS research paper focuses on how cities may or may not be considering housing equality when developing methods to adapt to increased flooding. Seeing as many cities in the United States are facing existential threats due to flooding due to climate change, this topic seemed relevant to study now and for decades to come. While my technical paper looks into how cities might begin to develop resilience strategies in the face of increased flooding, my research paper looks at the societal impacts of those strategies on the most vulnerable populations in society. My topics look at two sides of the flooding problem, but are connected due to their proximity to resilience strategies.