Thesis Portfolio

A Cloud-Based Flood Monitoring and Alerting System
(Technical Report)

Climate Change Unconcern in Rural Pennsylvania
(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

The issue of climate change can be challenging to tangibly feel and realize visually. Widely accepted as an imminent and extensive danger to the human condition and our planets health, many see it as an issue that will be irreparable if efforts to reverse the effects are not met with urgency. On paper, rising temperatures, increases in particulates that relate to human industrialization, and rapid changes in the balance of Earth's functions reveal a clear trend of anthropogenic climate change. In order to focus on how the issues of a changing environment can be dealt with, I concentrated my technical research on ways in which damages from rising water levels can be mitigated, and my STS research on why some groups of people either do not believe in human caused climate change, or why they do not feel the need to act in preventing further harm.

Changing climate conditions have caused situations in which heavy rainfall events are both more frequent and intense in the mid-Atlantic region. With the outdated and unprepared drainage infrastructure of the US, flooding has causes more than three billion dollars of damages annually in the United States. In the greater Charlottesville area, flooding is becoming an issue that homeowners struggle to deal with. In the next 30 years, over 1500 homes in the city of Charlottesville are expected to be at risk of flooding; the objective of our capstone project is to develop a system that warns residents of potential rapidly developing flooding events. Using sensors on the Internet of Things network and deploying several applications of cloud technology, the system architecture delivers alerts depending on sensor readings, and analysis on recorded data can be performed to develop models.

Climate change skepticism is a factor of numerous experiences of one's environment. Many who criticize climate change skeptics use the argument of knowledge deficits, that those who do not acknowledge that there is real, damaging environmental shifts that are caused by human industrialization is a matter of not understanding or learning about climate science. Alternatively, studies have observed that the doubt that scatters many polarized groups can be explained more so by the experience one has with their environment, and the social systems that they take part in. My research focused on the rural areas of America and their experience with information about climate change, and in particular I analyzed cases of climate change skepticism in rural Pennsylvania.