Community Fridges Usage Data Acquisition

Project Team: Damian Ashjian, Jermane Jackson, Ethan Leyden, Khuong Nguyen
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Faculty Advisor: Daniel Cranston, Ph.D.
Sponsor: RVA Community Fridges
Mentors: Taylor Scott, John Jones, Ph.D.

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In Richmond, Virginia, 20.3% of residents experience food insecurity, significantly higher than the national average of 14.3%. RVA Community Fridges (RVACF) is a mutual aid organization dedicated to fighting food insecurity. To do this, they maintain 14 fridges across the city, where community members can donate and access nutritious food freely. RVACF relies on volunteers to keep the fridges stocked and functional. But fridge usage and maintenance must be tracked manually, which presents challenges in managing resources efficiently.

To address this, our VCU Senior Capstone team has developed an automated data collection system using Raspberry Pi devices and cellular technology. This system collects aggregated fridge usage and temperature data, uploading it to a scalable cloud-based platform on Amazon Web Services (AWS) for storage and analysis. Our system also integrates into RVACF's existing Discord server, allowing volunteers to respond quickly to maintenance alerts and access data from the fridges. This system improves food distribution, accelerates maintenance response times, and provides the data necessary for securing grants and long-term sustainability. With this technology, RVACF can expand its operations, ensuring greater food accessibility for the Richmond community.