Raitong Organic Farm
Executive Project Summary

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For our senior capstone, our group of three ECE/CS students designed and built an integrated environmental sensor to monitor Raitong Organic Farm in South Eastern Thailand. This farm primarily produces high quality rice and livestock (pigs) and additionally serves as an example of the effectiveness of an organic farm. Bryan, the farm owner, hopes this sensor will help make the environmental data of the farm more accessible (via a website) and ultimately be reproducible for use with other farms.

Development of an updated prototype will rely heavily on work with Bryan and his experience with the previous prototype, as well as feedback from previous years. Through communication and analysis of the success (and faults) of previous designs, this prototype will improve upon past designs to best meet the needs of the farm.

This product will use a variety of environmental sensors to monitor the conditions of the farm and livestock. The collected data is then graphically displayed on a website. This will allow the farm to monitor their environmental conditions as well as predict the health of its plants and animals. In previous prototypes, methane, nitrogen dioxide, light, air pressure, temperature, and humidity sensors have been incorporated. In our prototype, we focused on the communication and storage backbone of the sensor array. We integrated an LTE modem, backend database, and frontend web page to control the flow on sensor data.

This project was managed through consistent communication among the design team, weekly meetings with the local project partner, Dr. Kendra Sharp, and frequent messaging via WhatsApp with the farm owner. Ultimately, our project succeeded by producing documentation that would allow the continuation of this project in upcoming years. Our group was able to build working prototypes that demonstrated how our research could be applied to the real world.

The final result of our project is a transition document that provides the next group with everything they need to build a complete—integrated—environmental sensing system. The knowledge we gained this year could not be fully applied due to travel restrictions imposed by the Thailand and American governments. However, we were able to learn a lot, build some prototypes, and provide guidance to our project partners. We hope that in the future a new group will be able to travel to Thailand to fully integrate a sensor array.