Thesis Portfolio

Integrating Modularity for Mass Customization of IoT Wireless Sensor Systems

(Technical Report)

Investigation of the Effects of Smart Farming on Decision-Making in Agriculture

(STS Research Paper)

An Undergraduate Thesis Portfolio
Presented to the Faculty of the
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SocioTechnical Synthesis

With the growing investment of different industries in IoT, there is a need for a system that can be quickly modified to meet the sensory needs of any scenario. While the study is centered on designing a wireless hub that meets this need, the focus is on the study of modularity, and how that is being implemented into the design. The technology being created in my capstone project is an integrated IoT system that can be used in a variety of applications to allow connection to a variety of radios using different wireless protocols, and different communication protocols. It's important to understand how each stakeholder interacts in order to minimize risk for the risk-bearers. We need to consider how changes in stakeholder interactions may shift the future of how farmers make decisions, and where their dependencies lie. This is important in maintaining a fair distribution of risk and benefits over time in agriculture. The theory of technological momentum, or the shift in decision-making from active to passive over time, illustrates the cause for the research problem. On the other hand, understanding risk, and transitioning away from duty ethics can show the appropriate approach to a large portion of the problem. The research will be conducted by analyzing separate case studies of decision-making processes within agriculture, and supplementing those case studies with public survey results from farmers and precision agriculture professionals. I expect to find how farmers' perspectives on smart farming decisions and producers' perspective on smart farming decisions interact, and how each stakeholder has been affected by the growing implementation of IoT in farming. The findings will allow for outscoping to more general IoT ethical implications, in which farming is just one example. While this capstone technology doesn't directly solve the problem, I have now become a stakeholder in the problem as an engineer, and need to understand the farmer perspective if they were to use this. If I don't consider their perspective, then they may bear more risk than necessary as far as the decisions they have the power to make.