

Thesis Project Portfolio

Pantastic

(Technical Report)

Social Construction of 3D Printing

(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

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Department of Computer Engineering

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Sociotechnical Synthesis

The technical portion of this thesis involved the design and construction of a device which measured the temperature of a stovetop in a contactless manner. The interest behind this was to design a device which could aid a home cook in knowing if a burner had reached an appropriate temperature as well as serving as an alarm in the event the stove was left on or became too hot.

The technical portion was completed by working in a team to design the electrical schematics, the device case, and write the code to run the device. The result was a fully functioning appliance that could measure temperature accurately from up to six feet away and send the data to a web application via WIFI.

The team accomplished all of the primary objectives and most of the secondary objectives and was extremely satisfied with the project. The only functionality the team wanted but did not implement was running the device over battery power. Future iterations of this project could be done to implement battery power, a on device screen, more user options, a smaller design, and a phone app.

The STS research thesis involved the examination of waste produced from 3D printing. The interest behind this was generated from the amount of plastic waste that was produced when 3D printing a case for the device built in the technical portion.

The goal of the research project was to understand what causes 3D printing to produce waste and how the social groups involved with 3D printing are reacting to this waste. This was achieved and several methods of waste management were researched and discussed. Further research could be performed by further understanding each of these waste management methods, society's waste management issues in general, or the laws and regulations around plastic waste.

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