

2020 Vision: Wearable Haptic Ultrasonic Object Detector
(Technical Report)

U.S. Theme Park Promotion of Technological Enthusiasm
(STS Research Paper)

An Undergraduate Thesis Portfolio
Presented to the Faculty of the
School of Engineering and Applied Science
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Computer Engineering

by

Jazlene Rae Guevarra

May 6, 2020

List of Contents

1. Preface
2. Technical Report: 2020 Vision: Wearable Haptic Ultrasonic Object Detector
3. STS Research Paper: U.S. Theme Park Promotion of Technological Enthusiasm
4. Prospectus

Preface

Successful technological systems accommodate diverse users' needs. The technical and STS research problems consider end user accommodation: engineers accommodate persons with disabilities in their designs; theme parks accommodate diverse visitors.

How are engineers considering user disabilities in technological innovation? The research team developed a device to apply object detection to increase the awareness of visually impaired persons in blind spots. *2020 Vision* is a wearable device that communicates through haptic feedback, alerting the user to objects in the path of travel. An algorithm was programmed in a Texas Instruments MSP430G2553 microcontroller; it takes analog distance input from an ultrasonic sensor, sets the threshold values, and triggers vibration motors. The prototype device is simpler than existing alternatives.

How are U.S. theme parks promoting technological enthusiasm? Theme parks attract visitors in part by appealing to their enthusiasm for technology; in turn parks reinforce visitors' technological enthusiasm. The cycle promotes technological consumerism. Theme parks' fetishization of innovation may deter other visitors who prefer other theme park experiences.

I would like to acknowledge Kevin Dela Merced, a University of Virginia Electrical Engineering alumnus, who served as a supportive friend and mentor for me and my technical capstone team.