Project Greenville

Improving the Read Range of UHF Passive RFID Wristbands
ELECOMP Capstone Design Project 2024-2025

Sponsoring Company:

Zebra Technologies Corporation
1 Alboin Rd., Suite 100
Lincoln, RI 02865
http://www.zebra.com

Company Overview:

Zebra Technologies Corporation and its subsidiaries provide enterprise asset intelligence solutions in the automatic identification and data capture solutions industry worldwide. The company designs, manufactures, and sells printers, which produce labels, wristbands, tickets, receipts, and plastic cards; dye-sublimation thermal card printers, which produce images which are used for personal identification, access control, and financial transactions; RFID printers that encode data into passive RFID transponders; accessories and options for our printers, including vehicle mounts and battery chargers; stock and customized thermal labels, receipts, ribbons, plastic cards, and RFID tags for printers; and temperature-monitoring labels primarily used in vaccine distribution. It also provides various maintenance, technical support, repair, and managed and professional services; real-time location systems and services; and tags, sensors, exciters, middleware software, and application software; as well as physical inventory management solutions, and rugged tablets and enterprise-grade mobile computing products and accessories. In addition, the company offers barcode scanners, RFID readers, industrial machine vision cameras, and fixed industrial scanners, workforce management solutions, workflow execution and task management solutions, and prescriptive analytics solutions, as well as communications and collaboration solutions. It also provides cloud-based software subscriptions and robotics automation solutions. The company serves retail and e-commerce, manufacturing, transportation and logistics, healthcare, public sector, and other industries through direct sales and a network of channel partners. The company was founded in 1969 and is based in Lincolnshire, Illinois.

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Project Motivation:

In pursuit of various of Zebra's healthcare product initiatives, this project is part of an effort to significantly improve the user-friendliness and patient-friendliness of Zebra's RFID-enabled patient tracking wristbands and related devices such as wristband printers.

Specifically, this project aims to increase the range of Zebra's RFID systems.

The project has the potential to positively impact *millions* of deployed RFID wristband tracking devices worldwide *per year*.

Anticipated Best Outcome:

Improve the read range of UHF passive RFID wristbands at FCC and ETSI frequencies.

Project Details:

The human body absorbs RFID energy, limiting the read range of person-tracking wristbands in many applications.

The URI Capstone team will research and define materials, coatings, and/or constructions that will enhance the read range of RFID wristbands on a human wrist. The primary challenge is answering the question: How can one reduce the interference caused by the human body?

An ideal output from the team would be a one-part solution that could be run through Zebra's RIFD printer.

Composition of the Team:

2 Electrical Engineers

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Skills Required:

- Adaptable, quick learner, highly curious.

- Interest in, or experience with, RFID technology.

- Interest in, or experience with, electrical engineering technology applied to biosciences.

Anticipated Best Outcome's Impact on Company's Business, and Economic Impact

Increasing the range of these systems would better avail them to not only healthcare markets but also to border monitoring, hospitals, event security (especially those involving very large crowds), hospitality industries, and recreational fields.

Broader Implications of the Best Outcome on the Company's Industry:

The best outcome, if achieved, could increase patent safety while reducing total cost of ownership of Zebra's RFID tracking systems by increasing their range.

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