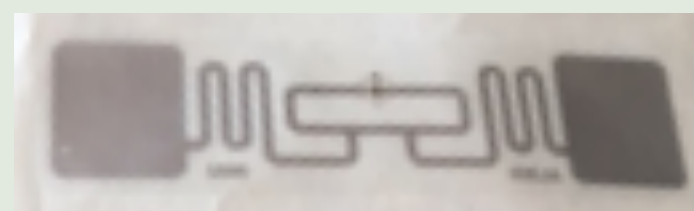
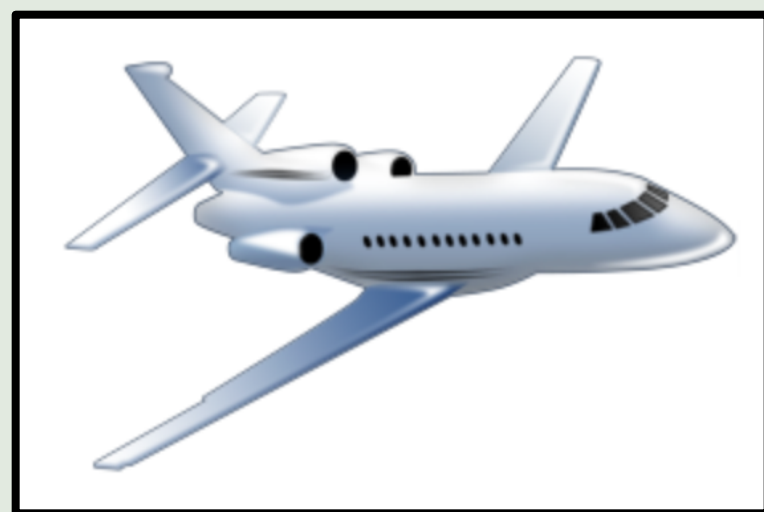
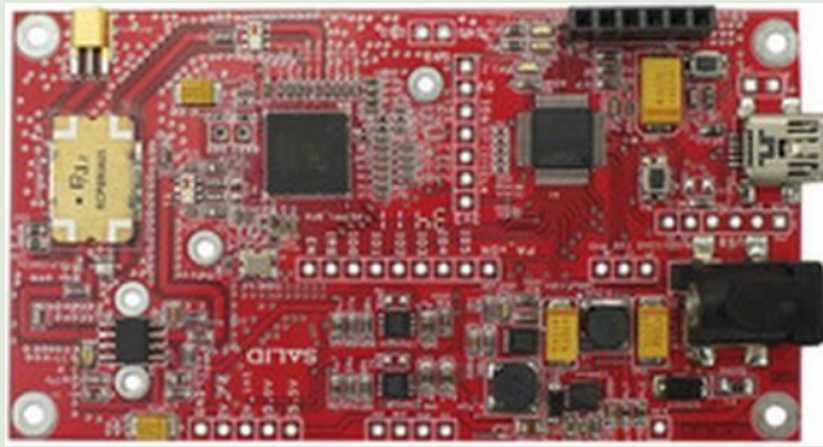


RFID Luggage Tracking

Design Team 1



Abstract

Mishandled luggage costs airlines \$7 billion annually. With its low cost and long range communication, UHF RFID technology provides a method by which tagging and tracking an item becomes faultless and cost-effective. Design Team 1 was able to create a system in which an airline and its customers can passively track travelers' luggage. The team sees RFID technology as a future component of every commercial industry.

Objectives

The team's main objective was to create a user-friendly and easily integrable system to track and identify luggage. Dr. Satish Udpa wanted a traveler to be able to a piece of luggage at any given time using a simple, but informative iOS mobile Application.

Requirements

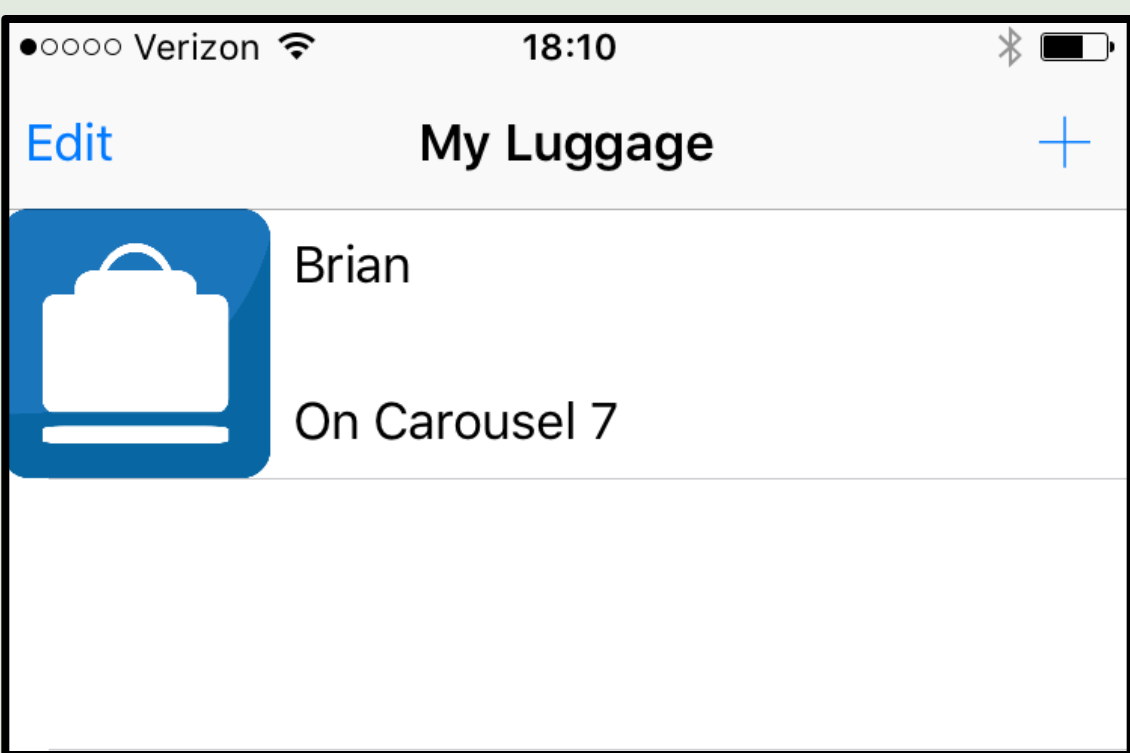
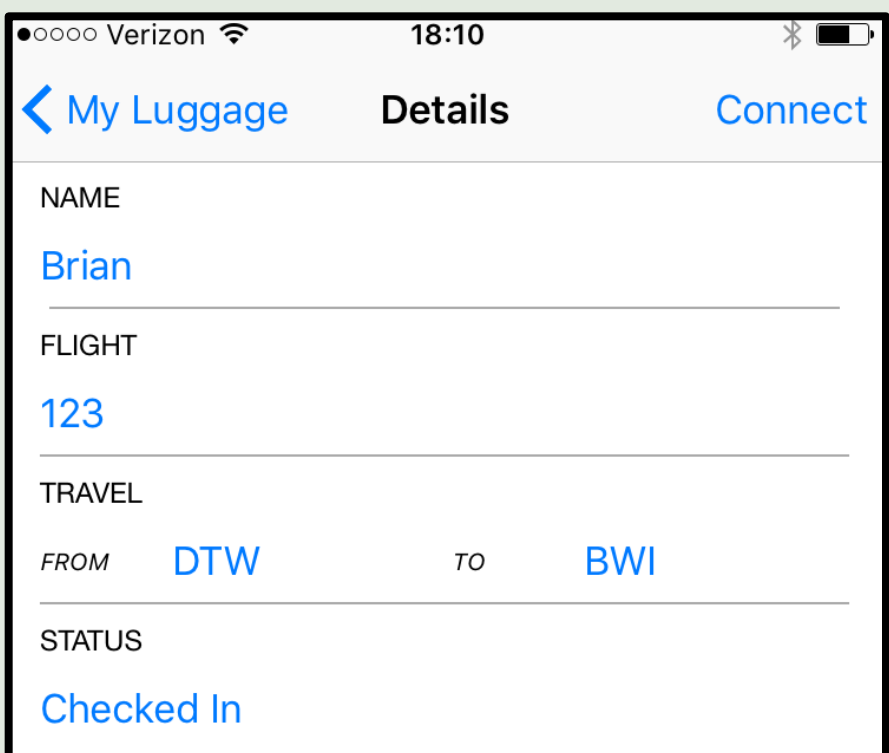
- Low-cost, high-ROI, easily-integrable system
- Ability to scan and uniquely identify multiple RFID tags
- Well-organized database containing all relevant information to a piece of luggage
- An iOS Application with the capability to inform a traveler of the location status of his or her luggage

Final Design

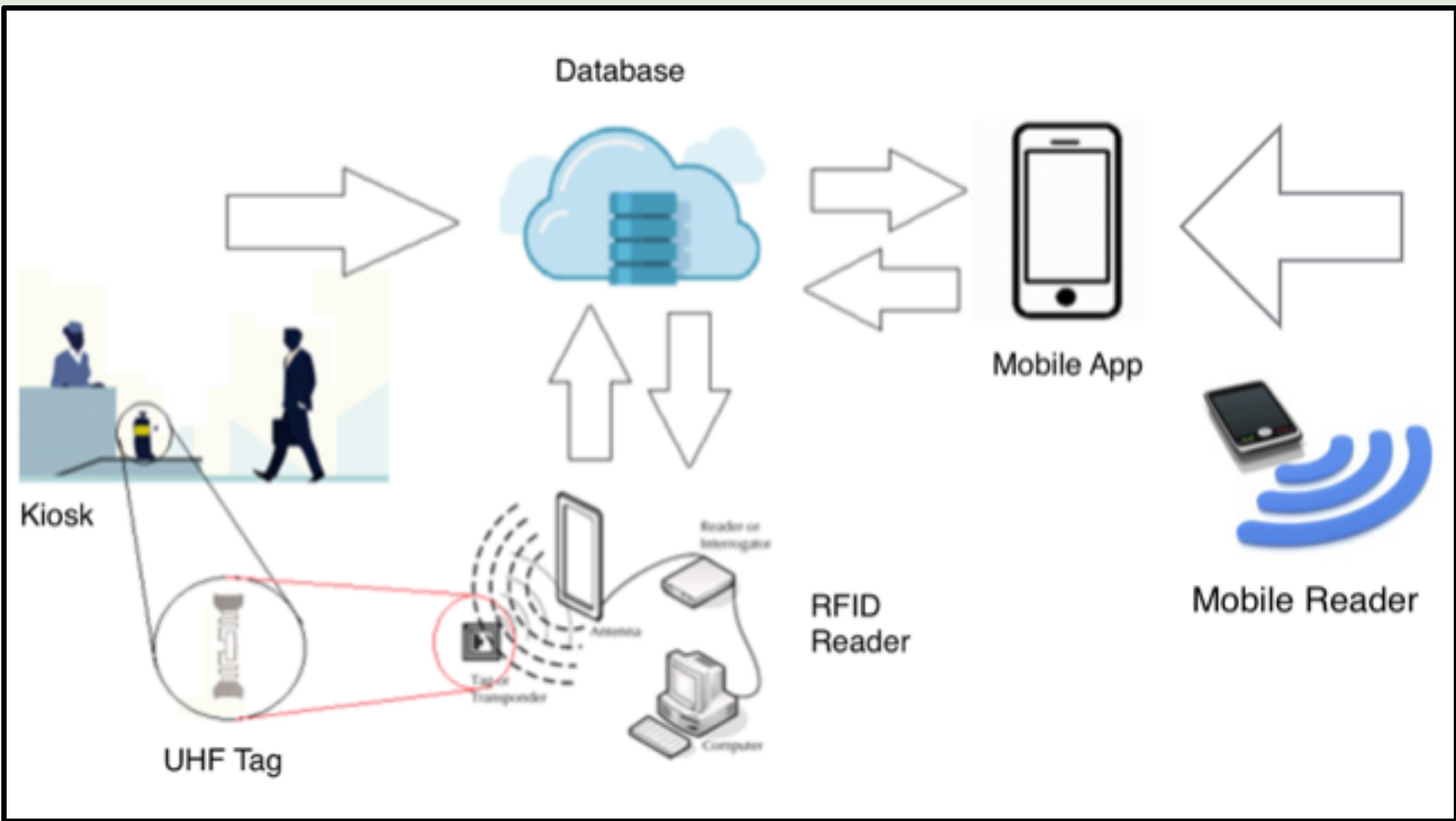
The final design of the team features a mounted, airport-side reader, a mobile reader attachment, and an iOS Application. The mounted reader has a reading range of up to 5 meters and can scan multiple UHF RFID tags simultaneously. The team's mobile reader connects to a bluetooth-enabled device within a 46' range and has a reading range of 3.5" with the current antenna. The iOS Application allows the user to see the most recent status of a luggage item by pulling information from a remote database. Additionally, the iOS Application controls the reader and emits a sound when the desired tag is within range of the antenna.



Final Reader Designs



Final App Design



Overall Project Design

Testing and Results

Mounted Reader Range

Range	Single Tag	Maximum Tags (15)
Touching	X	X
5'9"	X	X
7'7"	X	

Mobile Reader Characteristics

Function	Range
Bluetooth Connectivity	46'
Single Tag Scan	3.5"

The testing yielded the following conclusions:

- Number of tags that can be read simultaneously is inversely proportional to reading distance
- Rechargeable, battery-powered mobile reader can run for 4 hours.
- RF signal can permeate through materials, but is quickly attenuated by metal objects
- Tags should be affixed externally on luggage items for best results.

Budget

The team had a \$700 budget to build the RFID tracking system. The table below shows the budget allocation.

Products	Cost
Mounted Reader	\$250
Mobile Reader	\$250
Apple Dev. Account	\$106
Miscellaneous Hardware	\$93
Total	\$699



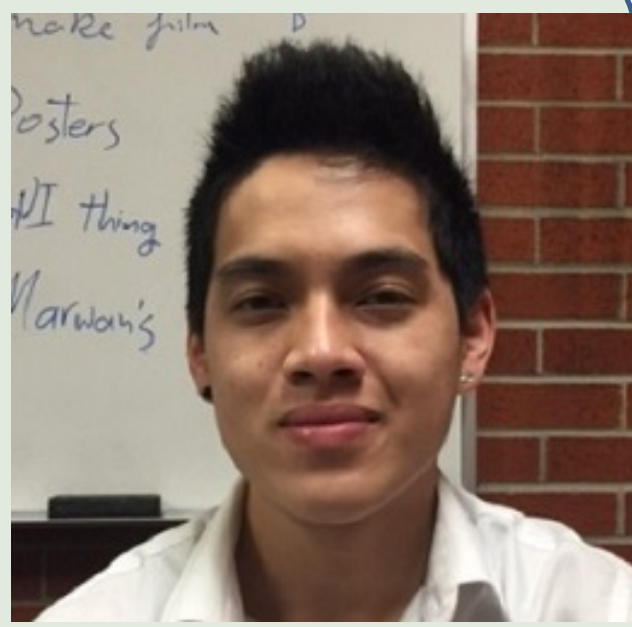
Dr. Satish Udpa
Team Sponsor



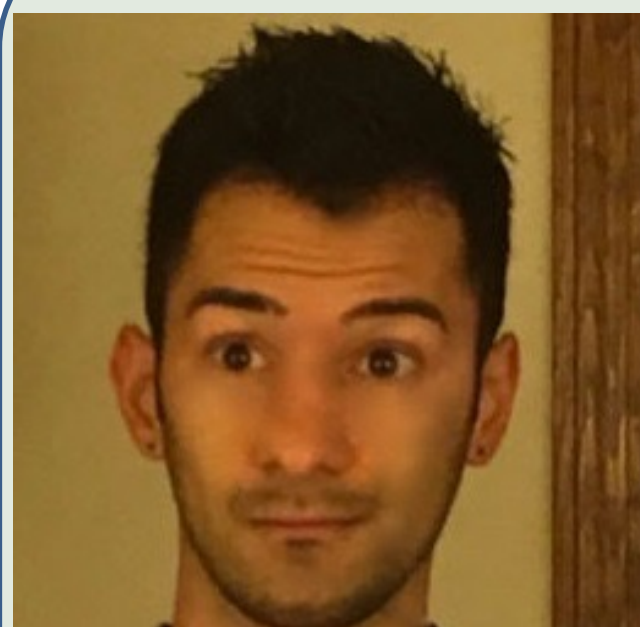
Dr. Tongtong Li
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Presentation Prep



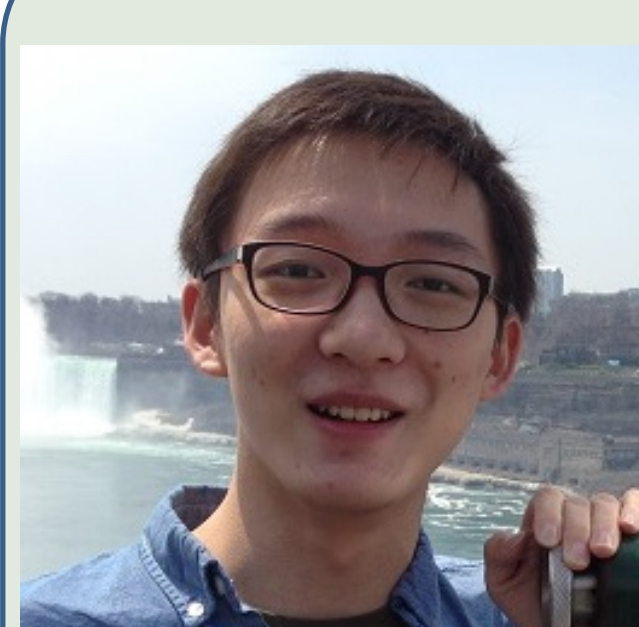
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