Spectrum Sensing using USRP

Team Members: Andrew Gutherie, Joseph Pang, Kunal Patel, Thomas Wright, Vijayrahul Rajathiruvenkatapathy

Industry: Defense

Pitch Title: Saving Lives through Radio Frequency Situational Awareness

Product Description

We are going to increase the safety of deployed soldiers by introducing significant improvements to the Army's radio frequency situational awareness. Our product will give deployed personnel the capability to identify wireless signals (cellular, Wi-Fi, Bluetooth, FM/AM radio), including those that can pose a threat to allied lives. With our system, soldiers will be able to see what signals exist in their geographical area, and can be alerted of signals that are anomalies or likely to be used by malicious groups.

Problem Being Solved

Right now the Army's ability to visualize the wireless spectrum is extremely limited; they can see the power of various signals, but have no way to differentiate between a cell phone signal and a FM radio signal (that a terrorist might use) at the same frequency. Our product will give operators the ability to identify out of place signals in a way that can alert friendly forces to possible hostile activity before there is a dangerous situation.

Competitive Advantage & Competitors

Competition is very limited in for this capability. Using machine learning, we are able to introduce a greater capability than any potential competitors (i.e. we can cover more possibilities that might pose a threat). Our implementation is on cheaper hardware than our competition, and our software based on open source code that is free to reproduce, so we are combining existing elements in a unique way.

Business Innovation

Our focus on commercial-off-the-shelf hardware and open source code keeps our costs to a minimum, and allows us to offer our product to customers at a price unmatchable by competition. Success criteria focuses on the product's ability to accurately identify anomalous signals. Innovation comes from using our low cost hardware to perform a very complex task reliably, and using machine learning algorithms to have the product to continuously train itself and become smarter over time.

Target Market & Societal Impact

The targeted customer is the US Army. Soldiers deployed overseas have the greatest potential use for our product, and our project could benefit them most. This will give the Army the capability to identify radio frequency signals like never before. An increased level of situational awareness will lead to a significant tactical advantage for its operators. The goal of our product is to bring more soldiers home alive at the end of the day.