<div align="center">

Product Design Specification:
Real Time Modulation Classification using FPGAs

Cory Nezin, Brenda So

March 18, 2018

</div>

A   Purpose

Wireless signal classification has applications in jammer identification, automatic cognitive radio control, and interference mitigation. The purpose of this project is to create a low-power, low-weight, low-latency device capable of state of the art modulation classification. The product includes a register-transfer level design and implementation of a convolutional neural network.

B   Features

- Cost: \$5-\$10 (ASIC), \$100 (FPGA)

- Quantity: 1000

- Maintenance: None

- Packaging: Ceramic

- Materials: Light-weight chip

- Weight: Less than 0.5 *pounds*

- Aesthetics: Small, darkly colored. Difficult to detect

- Product life: 2 years

C   Competition

- Qualcomm's "Snapdragon"

- Apple's "Nueral Engine"

- Cadence's "Tensilica Vision C5"

D Intended Market

- Military

- Academia

E Performance Requirements

- $50ms$ classification latency

- 75% accuracy or higher for positive SNR

F Life-cycle

- Predicted 2-3 years before obsolescence

G Human Factors

- Special training or documentation may be required for new users.

H Social, Political, Legal, and Ethical Issues

- Device may be used to kill people