QRC Vision Team (2) Statement of Work

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QRC is interested in evaluating the utility of object classification in terms of Radio Signals. Examining these radio signals currently requires a vast amount of experience. If, through the employment of technologies such as deep machine learning and convolutional neural networks, we can train a computer to recognize specific signal bands, QRC can extend the features functionality of their Wideband Transcoder. QRC also believes that this technology may be useful when training technicians or as a reference guide.

It is expected that we demonstrate and test open-source object-detection software to classify provided radio frequency signal data files. It is at our discretion which technology we decide to use. **The project goal is to provide a proof of concept demonstration, instructions for reproducing the results, and a ‘lessons learned’ report to QRC on time.** The proof of concept demonstration specific to Team 2 include classifications that identify Cellular WCDMA from other wide band signals, FM simple and side band FM from other signals, and P25 from DMR. It is imperative that the demonstration be deliverable by the middle of April, 2018. The deliverables must also include instructions, potentially in the form of a walk-through video, that will be sufficient to guide QRC engineers in the use of the final demonstration, as well as how to extend the design to recognize other signals. QRC engineers will learn and use the demonstration for a conference event taking place in early May.

The final delivery, due after the initial delivery, will include a 4-6 slide presentation encompassing an overview of the project, any limitations or risks encountered, and suggestions for improvements in further student work. The presentation will discuss the successful identifications as well as false positive identification behavior. QRC representatives have stated that they expect the classifier be ‘pretty good’ with the recorded signals, and less effective with real signals in a live environment. The final report will also include a poster board presentation for the class. As an extra deliverable, time permitting, QRC has requested that we determine the feasibility of porting our demonstration to the native Linux environment on the WBT.

Sent alongside this document will be the original proposed assignments from QRC.

Constraints on WBT Use (direct from QRC):

Team members should recognize that software and technical data authored and provided by QRC are not intended for distribution other than among team members and Major Design Experience (MDE) faculty.

QRC is showing team members sensitive information that is important to the Company. Team members must agree to protect QRC software with due care to prevent it from being publically distributed or hacked. Team members shall use the same care with QRC Software as they would use to protect their own most valuable personal information.

The team members agree to follow these software handling requirements for the “WBT Dev-Kit” and any other QRC authored software (collectively “QRC Software”):

1. A team member shall not provide copies of or analysis from any provided QRC Software outside of the team. Any QRC Software contained in the virtual machine image initially provided by QRC for the project shall be considered Company Private, for team use only.

2. Team members shall not will not reverse engineer, decompile, decode, decrypt, disassemble, or in any way derive source code from any QRC Software.

3. Upon request of the QRC Liaison (after receipt of the final project software deliverables to QRC) each team member shall remove all copies of any QRC Software from all information systems that contain QRC Software. (Human readable code developed in the project may be retained by team members for educational purposes.)