TO: Dr. A Malinowski, Dr. W. Anakwa, Dr. J. Schipper

FROM: Kevin Farney

DATE: Thursday, October 1, 2009

SUBJECT: Project Confirmation Memo

VBASV is the name of my project – Vision Based Autonomous Security Robot. There are no other students in my group. My login name is: kfarney.

The goal of this project is to design and interface webcams with a robot using a software development package. To do this requires an in-depth knowledge of computer vision. Most of this project will be learning and applying computer vision principles and image processing to navigate the robot down a corridor.

There are four goals for this project:

1. Definitely Achievable – Locate and navigate down the center of a corridor.
2. Should Achieve – Avoiding obstacles in real time in addition to locating and navigating down the center of a corridor.
3. Possibly Achieve – Map the hallway using images. Also, recognize locations (rooms/offices) using pre-defined images of those locations. Point-to-point navigation into rooms.
4. Would like to Achieve – Security Application. Locate and take a picture of an 'intruder,' possibly in the dark. Theoretically, lower-cost sensors (motion detectors) would give the VBASR a location to investigate and then the VBASR would locate and take a picture of the intruder.

I am planning on using the deluxe version of the iRobot Create which is a robotics platform. Many of the low-level robotics issues will be avoided by using this platform. Unfortunately the deluxe version is out of stock. However, the non-deluxe version is available and all of the extra accessories can be purchased individually. Microsoft Robotics Development Studio will interface with the iRobot command module via C code. The command module has its own development interface. An open-source library of computer vision functions is available online from OpenCV. Different camera options are available including the CMUcam and several styles of cameras offered by Surveyor Corporation, including a stereo vision option.