Remote Diagnostic Camera

Overview
In a printer, the diagnostics capability of the machine is limited by the numbers of sensors that come with the machine. It would be too expensive to mount lots of sensors everywhere in the machine for all possible situations. Our task in this project was to come up with a feasible solution that would eliminate the need for excess sensors, thus reducing cost. We designed an application to run on an Android tablet that would remotely control a Sony video camera in order to view pictures and videos that come from the camera and to help analyze problems that might occur in a Xerox printer.

Objectives
The goal of this project was to improve the design of a remotely controlled and flexibly mounted video monitoring system. We improved on the system by adding an adjustable grid overlay on side-by-side images, video playback, rotation of images, saving files with unique name capabilities, and image analysis tools.

Approach
- Visited Xerox in Webster, New York to get overview of project and collect Sony camera and Android tablet to be used for the project
- Collected task list from sponsor that listed all “Gotta Have” requirements and “Nice to Have” functions for the project
- Conducted a weekly meeting with Xerox to go over tasks accomplished in the past week and goals for the week to come
- Divided up work for the application: Zhuoqi and Jennifer focused on video page, saving files and image rotation, Zachary and John focused on the grid overlay and camera functionality constraints, Zhuoqi also performed image analysis work to remove noise from blurry images and image contrast enhancement
- Recorded demos when a new feature was added to the tablet to show sponsors and obtain their feedback
- Completed all “Gotta Have” tasks and a couple “Nice to Have”
- Tested application features by recording videos with paper going through printer and analyzed images to compare variations

Outcomes
We delivered a fully functional Android application with all features described. The application can also easily be used for future development if more features are desired at any point.

Using this software, we are able to more easily diagnose slight variations in images to analyze problems that might occur in a Xerox Printer.