

# Warren J. Baker Endowment for Excellence in Project-Based Learning Robert D. Koob Endowment for Student Success

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## FINAL REPORT

### **I. Project Title**

Starbucks Line Monitoring Project.

### **II. Student(s), Department(s), and Major(s)**

(1) Michael Roberts, BS Electrical Engineering  
(2) George Gargov, MS Electrical Engineering  
(3) Many others. See: <http://cpes.calpoly.edu/starbucks/doku.php>

### **III. Faculty Advisor and Department**

Dr. John Oliver

### **IV. Cooperating Industry, Agency, Non-Profit, or University Organization(s)**

University Union cooperated and helped install our camera, along with campus IT which protected the camera access behind a firewall.

### **V. Executive Summary**

We have developed a computer vision application to count the number of people in line at the Starbucks in the UU. The count will soon be published live on the web, and statistics will be tracked. Also coming soon are iOS and Android applications. This project has to date yielded one senior project and one soon to be defended MS thesis. Other senior projects and/or thesis documents will be published in the future as well.

### **VI. Major Accomplishments**

(1) Created a learning environment for students of varying backgrounds and abilities. Besides the far reaching technical positions for computer engineering/science students, the project also had a statistics team, and a graphics team that provided ample opportunity for students to apply their abilities, and work in a large multidisciplinary project.

(2) Empowered students who took initiative to take leadership positions and manage small teams that ultimately steered their portion of the project in a way they thought best.

(3) The coffee queue service is nearly ready for deployment. The algorithm, website, database, testing, statistical models, and graphics/advertisement are created and nearly ready for deployment.

## **VII. Expenditure of Funds**

Additional camera for expansion into second Starbucks in campus market

2 development machines for project members to use for algorithm development and testing, website and database development, and even graphics work.

## **VIII. Impacts to Student's Learning**

The project provided a plethora of opportunity for students to apply skills learned in their curriculum, as well as ample opportunity to learn new skills and abilities. The project was broken down into functional groups that carried out their piece of the project, with general meetings used to synchronize between groups that ultimately aligned project visions. This exposes students to organizational strategies carried out in top profile companies as experienced by several project leads.

Even at the expense of overall project progress, time was taken to explain technical concepts and design decisions to less experienced members. Guidance was also given for elective course selection for students, as well as linking seemingly irrelevant theory taught in the classroom to its application. The Coffee Queue Project presented incredible opportunity for project based learning for students who set aside time, attended meetings, and completed the necessary work.