The primary goal of my summer project was to successfully implement a stochastic crowd authoring algorithm that would give virtual crowds in activity rich environments a homogenous appearance. The project consisted of utilizing core concepts students learn in classes such as CIS 121 and CIS 262 and combining those fundamental concepts to address the problems facing the project. Today, Video games often utilize randomization and stochastic spawn rates to populate areas of interest (aka near the player) to achieve heterogeneous appearances of virtual crowds. However, our goal was to instead calculate optimal activity transition rates, or specific probabilities an agent will transition from activity A to activity B, to achieve a similar level of crowd heterogeneity. The majority of our testing was conducted with an existing model of Philadelphia’s Reading Terminal Market (RTM) created in Unity3D.

Before this project was started, the Reading Terminal had no notion of activities and no way to dynamically handle agent population of the market. Our first steps were to take a field trip to the RTM and gather data on the noise level and activity distribution statistics of the Reading Terminal Market. We would then take this data and integrate it into the model, and utilize the newly gathered data and existing heat data to alter area population statistics and implement appropriate parameterized behavior trees for unique activity interactions. To address the standing issue of the RTM having no way to label activities and dynamically spawn agents, we set out to implement those features into the model. To model the activity distribution data we collected from our trip, we proposed a finite-state automata based implementation of agent-to-agent interactions throughout the RTM. Essentially, the transitions between states would be the rates we would eventually seek to calculate to achieve the homogeneous crowd appearance.

The PURM award granted me not only exposure to a number of technologies foreign to my comfort zone, but also allowed me to discover a newfound passion for computer graphics. While there always existed within me a desire to take the classes offered by the DMD department at Penn, I never believed myself to be ‘artsy’ enough to excel in those classes. However, this summer I
learned that succeeding in computer graphics has more to it than just being a successful artist. Therefore, as a result of my experiences this summer, I have decided to apply to the masters program in Computer Graphics at Penn, and I have the PURM experience to thank for that.