CS242 Final Project Proposal

1. **Abstract**
   1. **Purpose**Simulate very simple ant movement on a grid
   2. **Motivation**Wanted to try to write a traffic simulation using Erlang (because the language is interesting), but it is not a good fit for the language. Instead I will simulate a population of ants moving around on a small grid.
2. **Technical Specifications**
   1. **Platform:** Desktop
   2. **Language:** Erlang and Python (probably will use python for data visualization)
   3. **Conventions:** Will conform to Erlang conventions
   4. **Tools:** Vim, Erlang compilers/debuggers/runtime, EUnit for testing
   5. **Audience:** Geeks
3. **Functional Specifications**
   1. **Features**
      * Pheromone Trails
        + Something that encourages the ant to decide a specific direction to move.
        + Ants can update trails when they are on a grid cell.
      * Obstacles
      * Sources of food
        + A destination the ants would like to reach
      * Microscopic simulation
        + Each ant makes it’s own decisions. Each ant it’s own actor.
   2. **Scope (Ideas not supported)**
      * Communication between ants through means other than Pheromone trails
      * Multiple ants in a single grid cell
4. **Timeline**
   1. **Week 1**
      * Get familiar with Erlang
      * Create a simple ant process
        + Pick a random direction and try to move there, if can’t don’t do anything.
      * Create a simple grid with a single type of cell
      * Simulate a single ant moving on the grid
      * No visualization expected except for debugging purposes
   2. **Week 2**
      * Add more ants to the grid and ensure that cells are occupied only by a single ant at a time
      * Begin implementing visualization
        + Post-mortem. Will visualize data dumped from simulation.
        + Consider real time with some sort of data colleting program
          - Read data from a socket and plot or store in real time.
   3. **Week 3**
      * Add Obstacles
      * Add Pheromones
      * Heavy focus on visualization
   4. **Week 4**
      * Add Food
        + Ants will use pheromones to communicate about location of food
      * Finalize Visualization
   5. **Future**
      * Add left out features specified in scope section