

CSC 370: Artificial Intelligence

Spring 2015

Project Proposal

Team Members: Ben Wiley and Tommy Rhodes

Project Title: Managing Load in Telecommunications Networks with Swarm Intelligence

What is your vision for the project? Describe what the goals of the project are and what A.I. areas, concepts, and/or algorithms you will be exploring.

This project is meant to follow and attempt to reproduce the work done by Ruud Schoonderwoerd, Owen Holland, Janet Bruten, and Leon Rothkrantz (Schoonderwoerd, et al. 1996). The purpose of this project is to implement a swarm intelligence algorithm in order to solve load balancing in telecommunications networks. In order to maintain an evenly spread distribution so that no one node has too much traffic, the algorithm maintains a set of mobile agents. These mobile agents act similar to ants laying trails. They move between nodes and leave information based on the distance from the source node. Calls are then distributed among the network based on the information left by the mobile agents. The network is then evaluated by measuring the number of calls dropped.

What materials have you read as preliminary research? Wikipedia pages are ok for now, but your final paper should reference primary sources.

Schoonderwoerd, Ruud, Owen Holland, Janet Bruten, and Leon Rothkrantz. 1996. "Ant-based load balancing in telecommunications networks." *Adaptive Behavior* 169-207.

Majid al-Rifaie, Mohammad, and Mark Bishop. "The mining game: a brief introduction to the Stochastic Diffusion Search metaheuristic." University of London.

Majid al-Rifaie, Mohammad, Mark Bishop, and Tim Blackwell. 2011. "An investigation into the merger of stochastic diffusion search and particle swarm optimization." University of London.

What are your benchmarks for success? Submit a bulleted list of 3-5 criteria by which the success of your project will be judged. Be as precise as possible. For example, “We will correctly describe and implement the Upper Confidence bounds for Trees algorithm”, or “Our system will learn to play Tetris at a level that outperforms a purely random agent.”

- Successfully implement a swarm intelligence algorithm that manages load in telecommunications networks.
- Have said algorithm come close to or perform as well as that implemented by Schoonderwoerd, Holland, Bruten, and Rothkrantz.
- Potentially explore options for optimization or improvement of the algorithm we’re exploring.
- Potentially expand the algorithm to work for different network topologies or larger sizes.