

Developing Boss Behavior

Jason Palacios, Scott Munro, Ali Rashed, Josh Montgomery

Objective

Generate a boss agent that can effectively combat behaviors of player

- must react to player
- must be somewhat difficult
- must be beatable

Algorithm and network structure must be able to evolve
Diverse strategies

Process

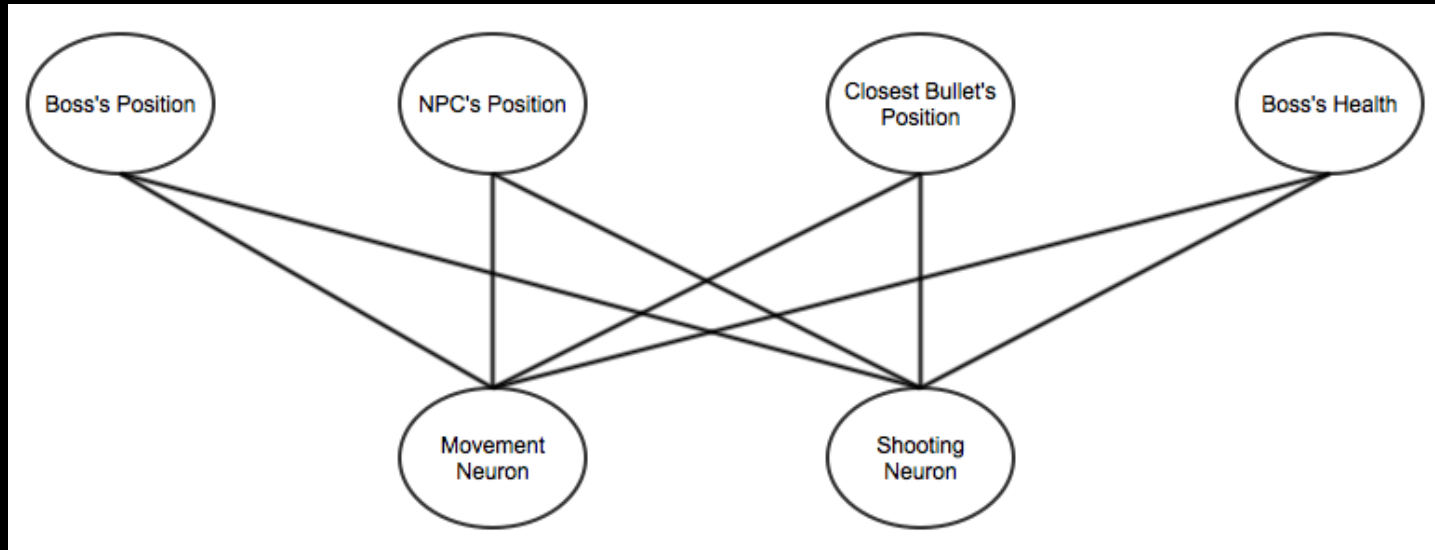
Created game-environment

- Coded in Python & PyGame
- Object-oriented

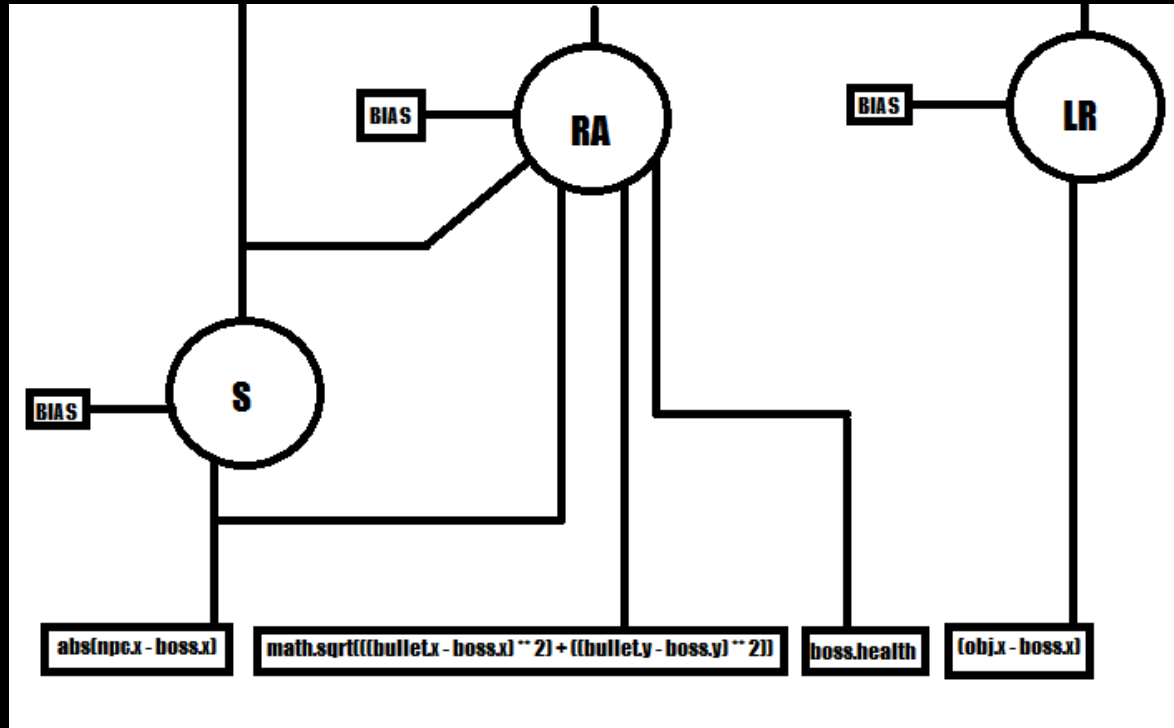
Developed/Implemented network structure

- originally NEAT but not feasible within timeframe
- tested multiple networks for the most appropriate network (S-RA-LR network, Simple Network, etc)
 - All networks were feed-forward

Simple Network



S-RA-LR Network



Training

NPC Agents

- programmed npc agents to battle the boss using repetitive or random actions
 - (i.e. stand still and shoot, move back and forth and shoot, hug the wall, etc.)

Training

Genetic Algorithm

- Generated new populations by breeding randomly selected parents from the previous generation
- Cycle through different NPC agent strategies either sequentially or randomly to encourage evolution and diverse boss agent strategies

Training

Fitness

Win: fitness determined by time it took to win and its health

Lose: fitness determined by the time it took to lose and the amount of damage it inflicted on the NPC

Draw: fitness determined by the difference in the boss's and npc's healths

Results

<https://www.youtube.com/watch?v=6kJXXUI3YWws>

Questions?

