Snake AI & Testing Framework

"What I Did on My Summer Holiday"

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Abstract

Original Goals

- ▶ Quantitative Analyses of Different AI Strategies

Background

- ▶ What is Snake
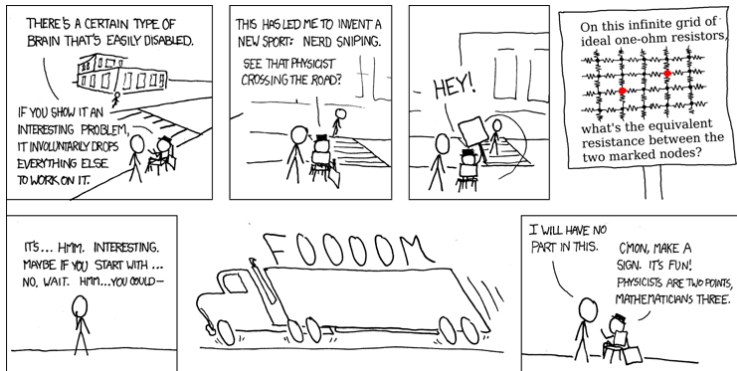- ▶ Motivation

Design - Chronological

- ▶ Ncurses
- ▶ Snake Game
- ▶ First AI
- ▶ Further AIs and Tools

What is Snake?

Motivation

XKCD 356 - Nerd Sniping

Ncurses (Console Graphics)

- Familiar
- Previous Project (Github)
- Not Event Based

The Game Class

Data

- ▶ Board Size
- ▶ Snake Length
- ▶ List of Body Points
- ▶ List of Pre-Rendered Body "Tiles"
- ▶ Apple Location
- ▶ Game Ticks

Methods

- ▶ Render
- ▶ Move

Other

- ▶ Enum for directions

First AI

Using A*

- ▶ Canonical Search Algorithm
- ▶ Simple
- ▶ Test The Framework
- ▶ Surprisingly Good

GitHub

Further AIs and Tools

Generalized Tree Search
- ▶ Cost Metrics
- ▶ Early Cutting

Tools to Inspect AI
- ▶ Plan Map
- ▶ Logging Framework

Collection of Metrics
- ▶ Inspection of Game's State (AI Agnostic)
- ▶ Isolated in Driver

Distractions, Biases, and Future Work

Distractions
- ▶ Making a Single Better AI

Biases
- ▶ I Prefer GOFAI

Future Work
- ▶ Metric for Worst/Average Decision Time
- ▶ Threaded Simulation
- ▶ More Simple AIs
- ▶ Adversarial Apple Placement