

Introduction to Computational Science

Optimizing Traffic Lights in Urban Street Grids

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Problem introduction

- Traffic lights
- Long waiting times



Problem description

- Algorithm optimization
- Minimize waiting times
- Maximize throughput

Model scope

- "American city" grid
- Only car traffic (bicycle and pedestrians may be possible too)
- No acceleration or deceleration (instant reaction time)
- Uniform cars (no buses, trucks etc.)



Example

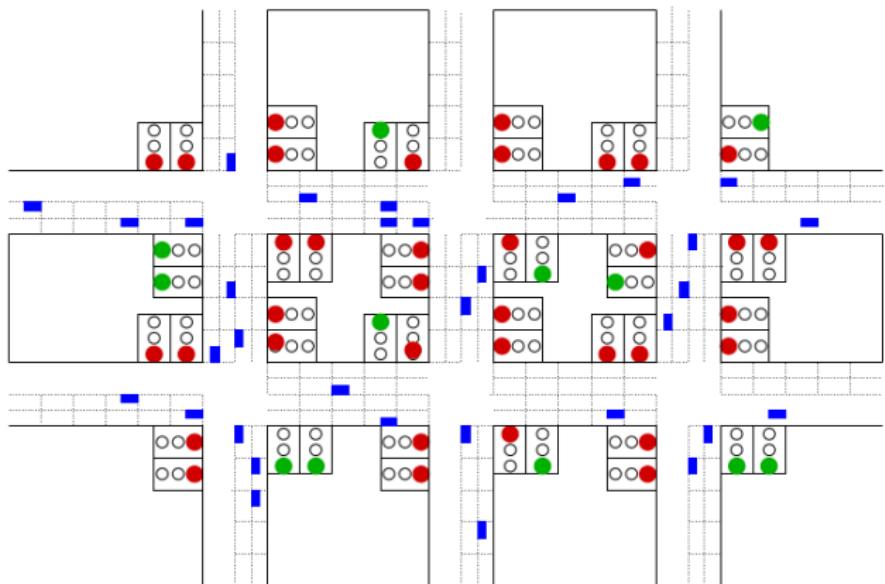


Figure: Model by Marco Wiering

Possible traffic light algorithms

- Individual timers
- Individual loop detection
- Globally connected timers or detection
- Random timers

References

- Marco Wiering: Multi-Agent Reinforcement Learning for Traffic Light Control