Talk outline

1. Introduction
2. Problem statement
3. Multi-Model traffic simulations
4. Experimentation
5. Conclusions, Lessons learned and future work

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Rutger Class <<rtuger.class@cs.kuleuven.be>

Microsimulations Multi Model Traffic
Introduction

Contact

https://distinit.cs.kuleuven.be

Rutger Claes@cs.kuleuven.be

Katholieke Universiteit Leuven Distinit Research Group Rutger Claes

LEUVEN

Katholieke Universiteit Leuven

Research Group Distinit
not our primary focus or expertise

Disclaimer: simulation and modeling is involvement in the MASe project

of validating our approach
Simulation for us is often the only way

Why do we use (traffic) microsimulations

or why am I here?

Some background

what we consider traffic microsimulation

Some background

simulation

Agents determine routing decisions during the agent

Every vehicle is controlled by a software

Every vehicle is explicitly modeled in the simulation

Scenario of vehicles in large scale traffic

Simulation of vehicles in large scale traffic
Problem Statement

Traffic Policy Measures
Safety and Environmental Effects
Evaluating the
A Model-Based Approach for

Road safety

Traffic behaviour

Environmental effects

Travel and Activity

Behaviour
Traffic Policy Measures
Safety and Environmental Effects of Evaluating the
A Model-Based Approach for

- Road Safety Effects
- Traffic Behaviour
- Environmental Effects
- Travel and Activity Behaviour
to capture these effects large scale simulations are needed
Highly detailed simulation is needed to study the impact of traffic on pollution, emissions, etc.

Insight in responsibility for emissions,

- Safety hazards, etc.

Clear link between activity and traffic.

- The activity of the driver

Routes will be chosen depending on

- Based routing.

Software agents responsible for activity required.

Microsimulation is
opportunities in the traffic domain

- Instead, focus on domain specific solutions
- Not starting with purely technical

Our approach

Simulations

Multi-Model Traffic
2 models, 2 possibilities
When to Switch?

- Avoid "flickerings"
- Looking at situation
- Looking at location
- Need for heuristic
- Need for monitoring

How to Switch?

- From queue to detailed
- From detailed to queue

Distance $\leftrightarrow$ time

- This far:
  - Travel and move if back
  - The distance if still has to
  - The segment, calculate
  - It is arrived at the end of
  - For every vehicle, given

- Distance $\leftrightarrow$ time

- Of the segment:
  - Vehicle to reach the end
  - Long it would take the
  - Position, calculate how
  - The vehicles current
  - For every vehicle, given
Experimention
\[
\text{Accuracy} = \frac{\bar{a} - \bar{a}_{\text{sim}}}{\sqrt{\frac{\sum_{i} (a_i - \bar{a})^2}{N}}}
\]

Accuracy defined as:

- Various traffic input rates.
- Small traffic network.

**Experiment setup**

Simulation goals:

- Finding good parameters is one of the
- The heuristic is parametrized

Accuracy:

- The heuristic used tries to maintain the
- Experiment heuristic
Conclusions, Lessons learned and Future work
Conclusions

Alternatives to model switching

- Evaluate our multi-resolution simulation experiments on a larger scale to further
- Heuristics

A thorough examination of switching

Limited. Future work involves:

The experiments described in this paper are

Future work
Contact

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Questions?

References


