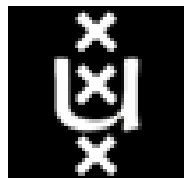# Reinforcement Learning of Traffic Control Systems Adapting to Accidents

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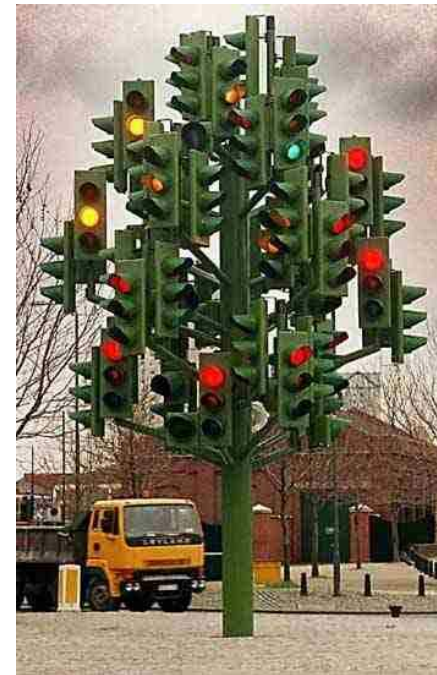TNO-FEL, The Hague

ICIS

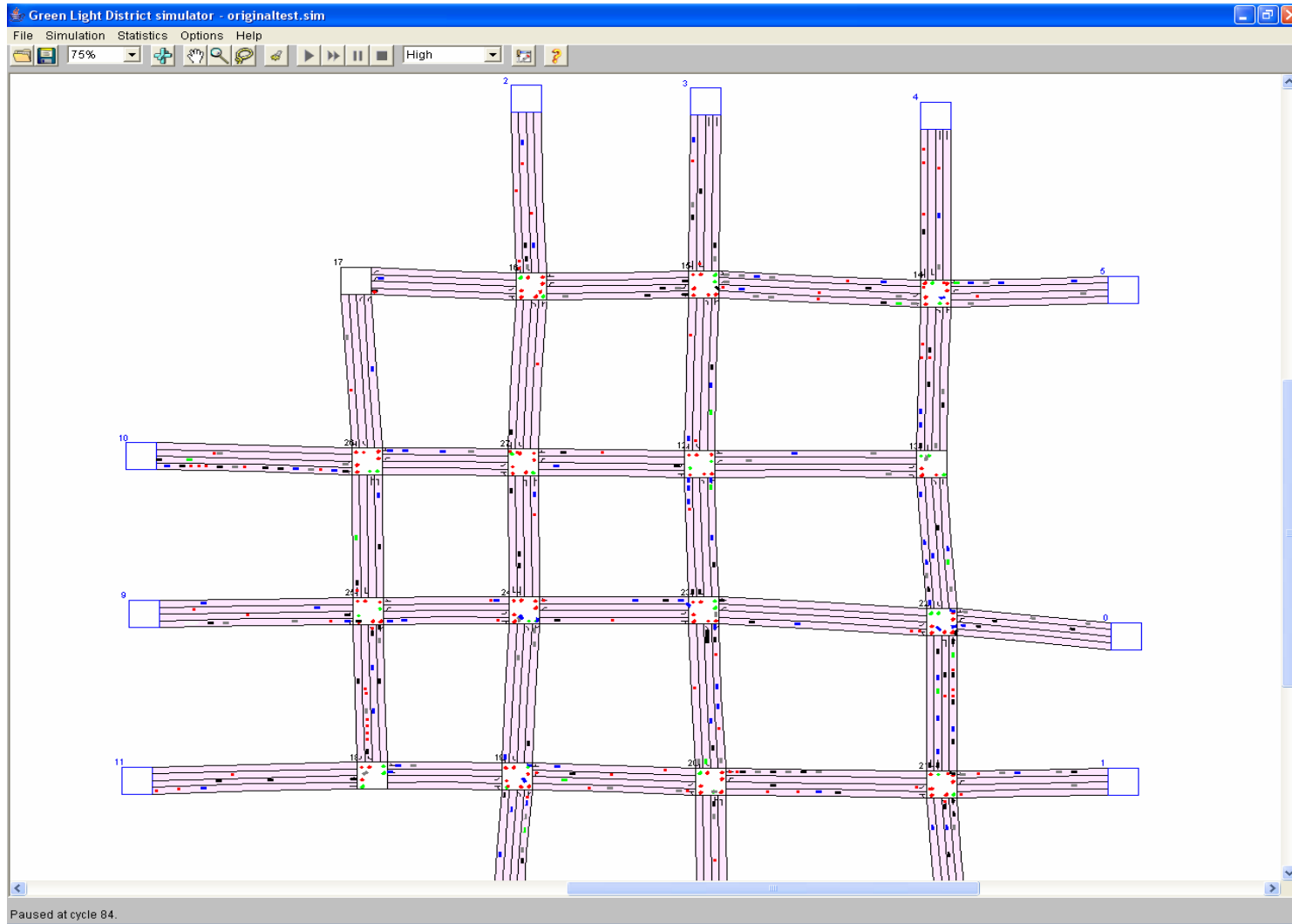Interactive Collaborative Information Systems

Our problem domain: traffic

Last year we started a project on *intelligent traffic control*, within a larger project on Interactive Collaborative Information Systems (ICIS)
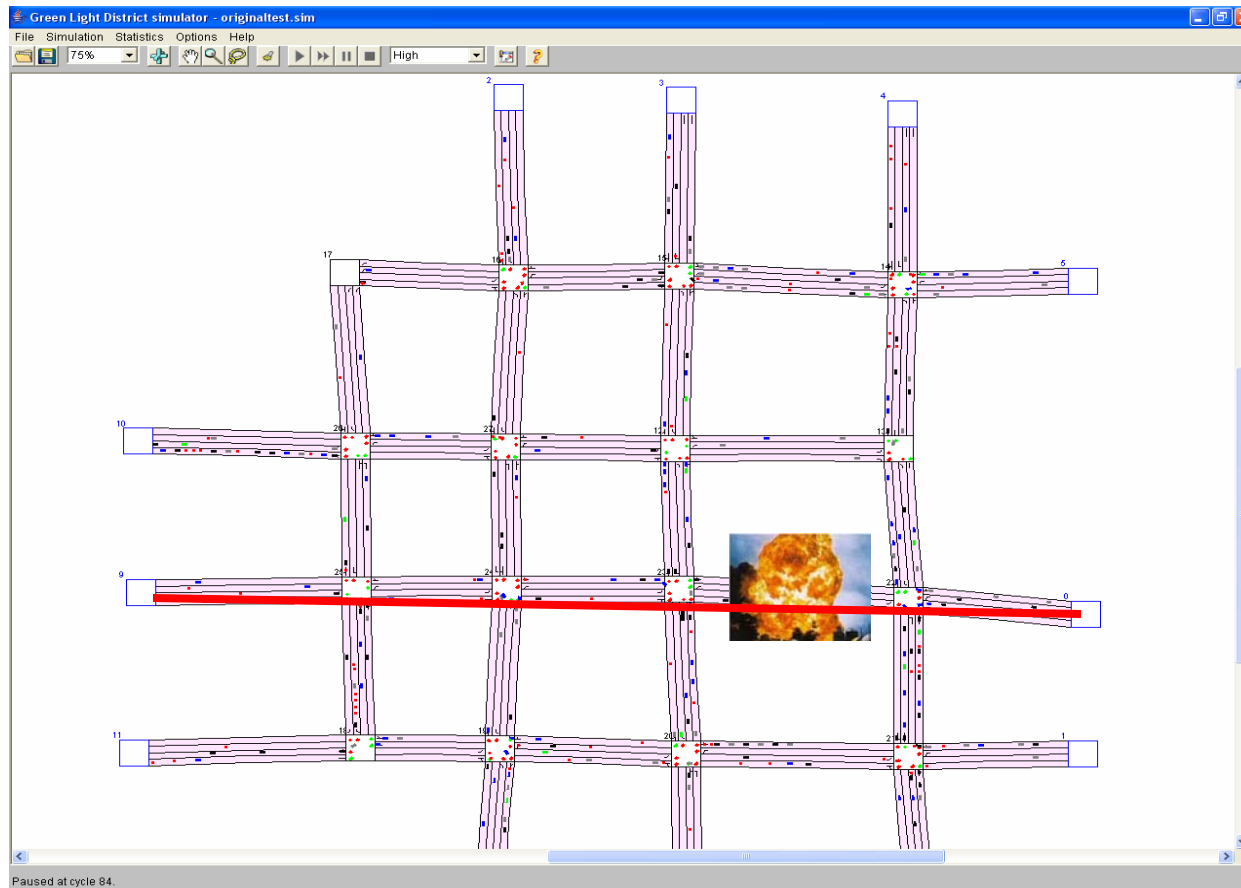
Using an urban traffic simulator

Intelligent traffic light control

- We developed an improved traffic light controller based on
  - Reinforcement learning (RL)
  - Measuring traffic congestion
- Outperforms non-learning and alternative learning controllers
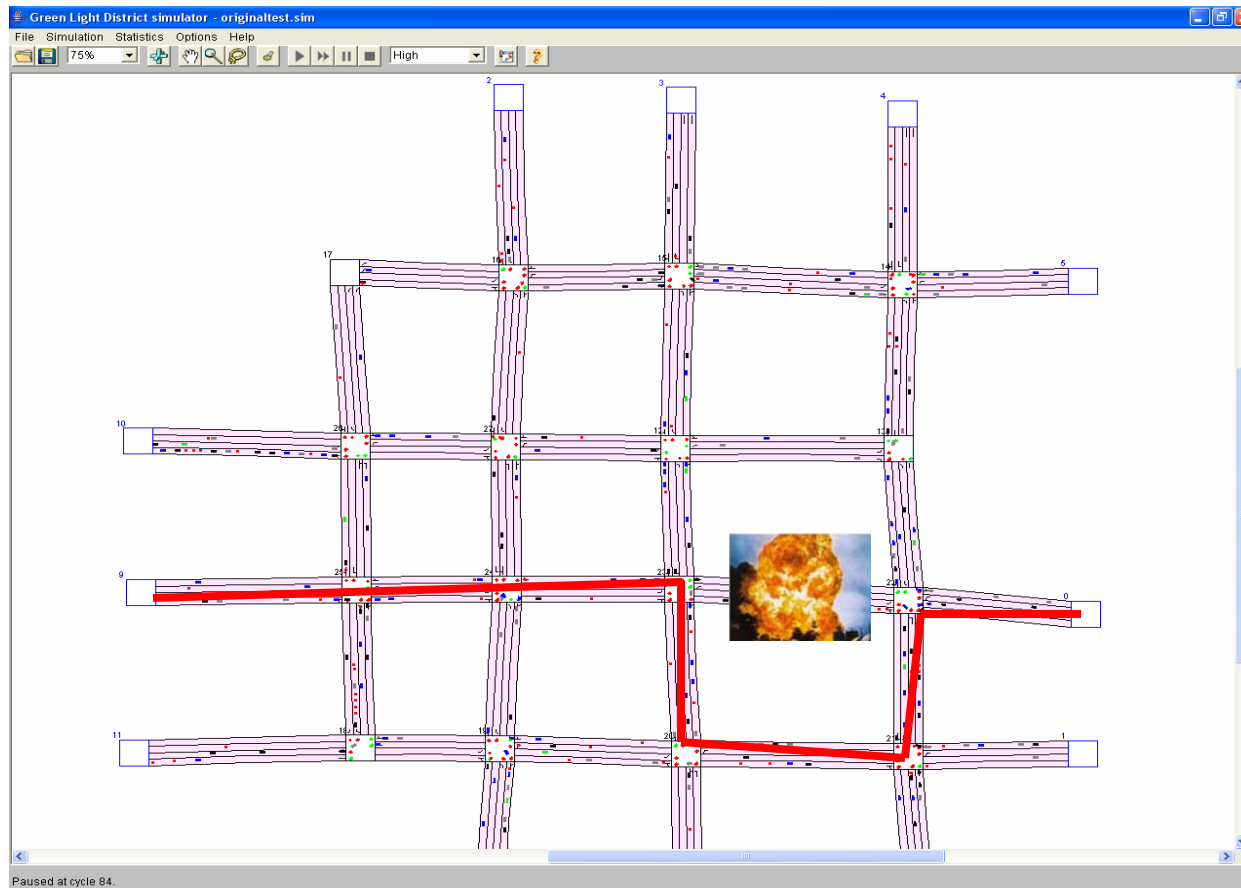 - Leads to lower average travel times for cars

This year's focus

- Dealing intelligently with accidents

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Dealing intelligently with accidents

- Adapting traffic lights to accidents
  - Making green lights toward accident site impossible
  - Facilitating routes that go around accident site
- Adapting car routes to accidents
  - Cars must replan their routes
  - Traffic control system can and should inform cars about best routes given accidents

Concrete steps

- Study basic papers
- Get familiarized with traffic simulator and RL methods
- Experiment with simulation of accidents
- Implement the traffic control system extension(s) for dealing with accidents
- Perform experiments
- Write report

What students get from this project

- Learn about and get hands-on experience with:
  - state-of-the-art RL algorithms
  - simulation and control of a model of an interesting and important real-world phenomenon: traffic
  - scientific experimentation to compare various algorithms