Traffic Simulation

Traffic Inc.:

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Traffic Simulation – the problem

- Simulate the traffic on a section of highway, allowing:
  - exploration of effect of different driver behaviours
  - visual representation of the outcome (animation)
  - production of aggregated data (histograms)

Traffic Inc – module design

Driver

Road:

`knows:` length, no. lanes, speedlimit
`maintains:` lists of cars: 1. ID order,
2. ordered on road
`action:` tells cars to update

Output:

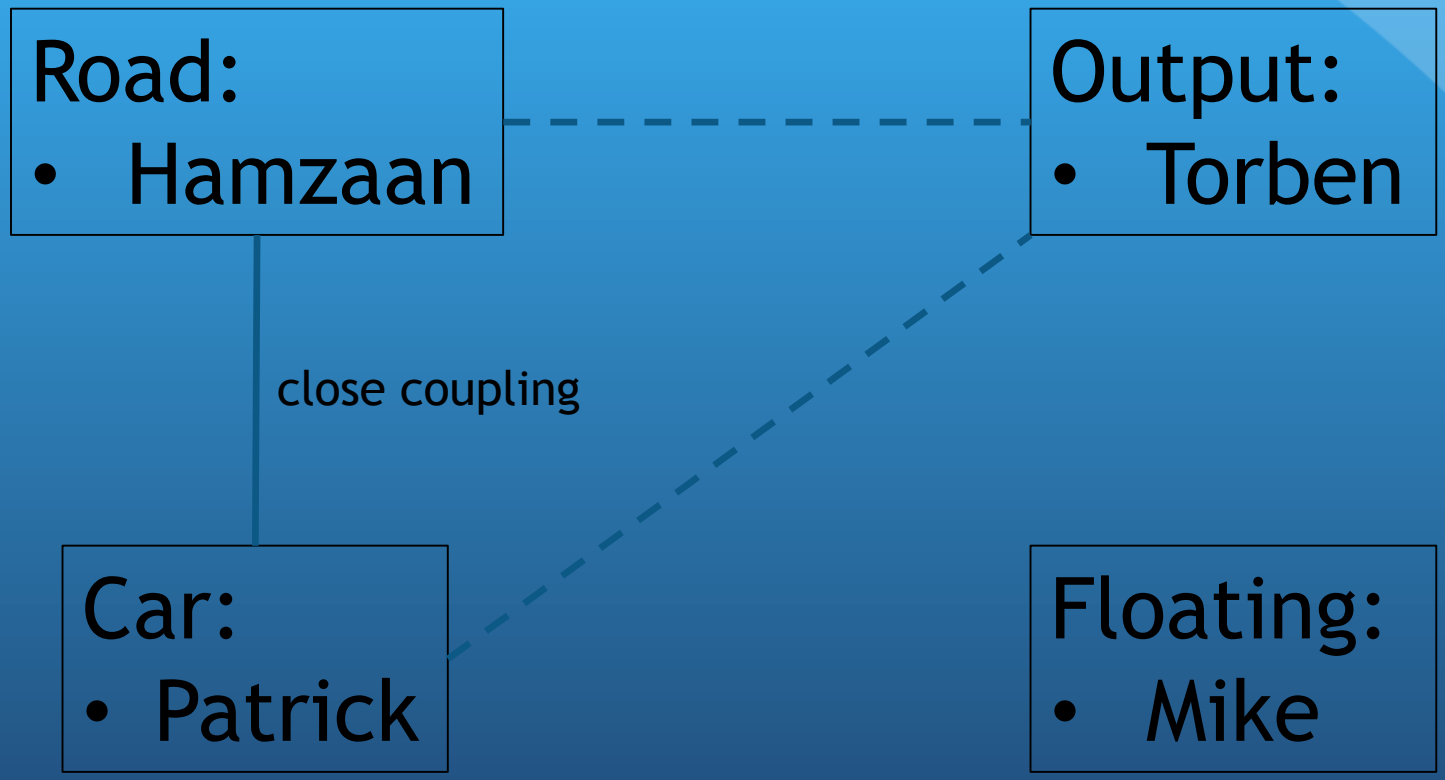
scrapes position & velocity
produces animation,
plots individual cars,
average & s.d.

Car:

`knows:` length, speed, position, driver behaviour(human?, aggression, criticalDistance, loss of attention)
`maintains:` info about cars nearby
`action:` update position, detect crash, `decide speed`

Car Car Car …

Traffic Inc – the team



Traffic Inc – ideas

Various car behaviours	✓
Length, aggresiveness, no. of occupants	✓, ✓, X
Multiple lanes	✓
Robot drivers vs human drivers	✓
Crashes	✓
Animations, statistical output	✓, ✓
Overtaking, switching lanes	✓, (✓)
Variable speed limits, obstacles	X, X

Traffic Inc – demo

Traffic Inc - Reflection

- Made great progress
- Had fun!
- Initial design worked well
  - Creaked a little each time we complicated driver model
    - crash detection
    - overtaking
    - lane changing
  - Simulation performance good (animation can't keep up!)
- Animated output helped debugging a lot
- Mercurial headaches!
- Started with trello
  - replaced it with physical whiteboard!

Traffic Inc – Want to have a look?!

- https://bitbucket.org/trafficinc/traffic-project