New Features in SUMO

SUMO User Conference 2016
Sublane Model

- Configurable lateral resolution for car-following and lane-changing
- Continuous positioning in x,y (pos, posLat)
- New lane-changing model to accommodate lateral dynamics
  - maxSpeedLat, minGapLat, latAlignment, lateral encroachment (lcPushy)
- Allow modelling of Asian traffic characteristics (flexible lane use, large proportion of two-wheelers)
- Improved modelling of car/bicycle interactions (overtaking on a single lane)
New Parameters for all lane-changing models

- One vType parameter for each changing reason
  - lcStrategic
  - lcCooperative
  - lcSpeedGain
  - lcKeepRight

- Control the likelihood (or eagerness) to perform lane changing for the respective reason
  - Public busses should be less likely to perform cooperative lane-changing that might put them at a disadvantage. (And should instead expect cooperation from everyone else)
Collision detection and handling

- Collisions are part of SUMO
  - Originally, bugs in the collision-free model (not all of them fixed)
  - Dangerous traffic light configuration
  - Intentionally unsafe car-following parameterization
    - new model for driver errors planned
- TraCI
  - So far, only detected along contiguous lanes
  - New option for detecting collision on junctions
    - Detect invalid positioning of internal junctions
  - New option for configuring collision handling
    - Teleport rear vehicle (current default)
    - Remove both vehicles
    - Warning only
    - Further extensions planned (i.e. vehicles block the road for some time before removal)
TraCl

- New vehicle command `nextTLS` to retrieve upcoming traffic lights
  - Returns variable length list `[(tlsID, tlsLinkIndex, distance, linkState), ....]`

- Improved coverage of the C++ client library
  - Vehicle add, remove, moveToXY
  - Variable subscriptions
  - Context subscriptions
  - ~90% coverage now (lots of additions already in 0.26.0)
Netedit support for additional network infrastructure (still in branch)

- Load, define, configure and save the following objects
  - Detectors (E1, E2, E3)
  - Rerouters
  - Stopping places (busStop, containerStop, chargingStation)
  - Calibrators
  - Variable Speed signs
  - RouteProbe detectors
Passing Blockage with Lane Changes
SUMO in Production Logistics

- Respecting „real“ dynamics in virtual inhouse logistic
- Coupling SUMO to existing material flow simulation
- Respecting oncoming traffic and lane changes
Passing Blockage with Lane Changes
SUMO in Production Logistics

- Using existing coupling of Plant Simulation and Malaga
MESO

- Uses the same inputs as SUMO
- Running time of microsim ~15s (avg vehicle TimeLoss ~95s)
- Run scenario again with option --mesosim ~1s
  - MESO is fast!
  - TimeLoss < 1? Add option --meso-junction-control
    - -> TimeLoss 50.0.
  - MESO does not model vehicle acceleration, impact on urban dynamics
Intermodal Routing

• Intermodal Trip chains

• Input
  • Network with bus stops
  • Transfer times
  • Timetables
  • Persons and their daily plans
  • Availability of modes

• Output
  • Fastest intermodal route
  • Respecting transfer times
  • To be run directly in the Simulation

<flow id="bus" from = "beg" to = "end"
line="bus" begin="0" end="1000"
period="300">
  <stop busStop="beg_0" until="10"/>
  <stop busStop="left_0" until="20"/>
  <stop busStop="end_0" until="30"/>
</flow>

<person id="p0" depart="0">
  <personTrip from="beg" to="end"
  modes="public"/>
</person>

<person id="p0" depart="0.00">
  <walk edges="beg" busStop="beg_0"/>
  <ride busStop="end_0" lines="bus"/>
  <walk edges="end"/>
</person>
Intermodal Routing

Outlook

• Bicycle traffic
  • Taking it with you in car and public transport
  • Transfer at defined stations
• Integration into the running simulation
  • Current travel times
  • Intermodal rerouting
• Import
  • VISUM
  • OSM
  • GTFS