



SUMO Workshop

1/2: Introduction to SUMO



History

Rhetorical back-stepping:

- First open source release on 05.02.2002 (I think; version 0.6)
- First implementation started at the begin/middle of 2001
- First design work started at the end of 2000

→ 10th anniversary in 2010/2011

...time to revisit several things



SUMO – Simulation of Urban MObility

Idea(s) behind SUMO

Support an open source traffic simulation for

- Reducing the work on new models/algorithms (mainly traffic simulation and traffic management)...
 - ... making them more comparable
 - ... expecting contributions from external parties

First own use cases were

- Supporting TAPAS with travel times (will be discussed later)
- Model/algorithm evaluation and comparison

... and the resulting software design

- Computation speed (simulation of large cities as fast as possible)
- Extensibility (for new model/algorithm evaluation)
- Try to solve everything with least user interaction possible



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Past projects

The original aims were actually not reached, yet, but SUMO was used in several DLR projects already:

➤ INVENT

Implementation and Verification of traffic management strategies for large cities (Magdeburg and Munich); mainly rerouting

➤ OIS

Measuring the benefits of traffic light algorithms that use camera-based traffic surveillance

➤ Traffic Tower

Virtual traffic management centre



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Past projects; continuation

➤ WJT2005 / Soccer2006

Integration of conventional (induction loops) and airborne traffic surveillance and extrapolation of the so gained traffic state into the future using a fast mesoscopic model (internal extension)

Performed in city of Cologne during the Weltjugendtag 2005 (pope's visit) and FIFA World Cup 2006

➤ TrafficOnline

Evaluation of traffic surveillance using GSM cellular phone data (sub-networks from Berlin)

➤ ORINOKO

Measurement of new weekly traffic light switch plans and derivation of own ones within the city of Nuremberg





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Fulfillment of internal Needs (so far)

Computation speed

- Ok; could always be faster

Extensibility

- Definitely very extendable
- Too extendable, in fact, now moving to use TraCI for internal projects, too, to avoid code bloat

Try to solve everything with least user interaction possible

- Yes, but there is always manual work necessary, and because of lacking tools, time consuming

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Current projects

➤ VABENE

Continuation of the work done in WJT2005/Soccer2006 for building a catastrophe management portal for administrative organizations (will be presented verbose later)

➤ PRE-DRIVE C2X

Simulation of V2X traffic management strategies (now closed)

➤ iTETRIS

Development of an open source V2X simulation architecture (will be presented verbose later)

➤ CityMobil

Simulation of automatic busses' scheduling

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Current projects

➤ AIM

Contribution to the AIM project by simulating the city of bunswick

➤ SimWorld Urban

Connection to DLR's driving simulators

→ The usage continues and further developments will be done; continuation until end of 2013 is assessed

A short side-note:

➤ “SUMO” as such is not a project; has no plan. SUMO is developed within other projects



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What about external people?

First external usages already in 2002

- Generating traces in “GPS Route” (Uni Dortmund)
- Simulation of Quebec in the “MAGS project” (Université Laval)



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Some external extensions and applications

Extensions (not complete, just the major ones):

- Axel Wegener's (TU Lübeck) TraCI (now integral part)
- ACTIVITYGEN, a new SUMO application, not yet verified, by Piotr Woznica & Walter Bamberger (TU Munich)

External applications (excerpt, also not complete):

- eWorld , Cadyts, SUMO Traffic Modeler, TraNS, iTETRIS' iCS, MOVE

... the external contributions will also be an issue tomorrow

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External publications

Few hundred external publications

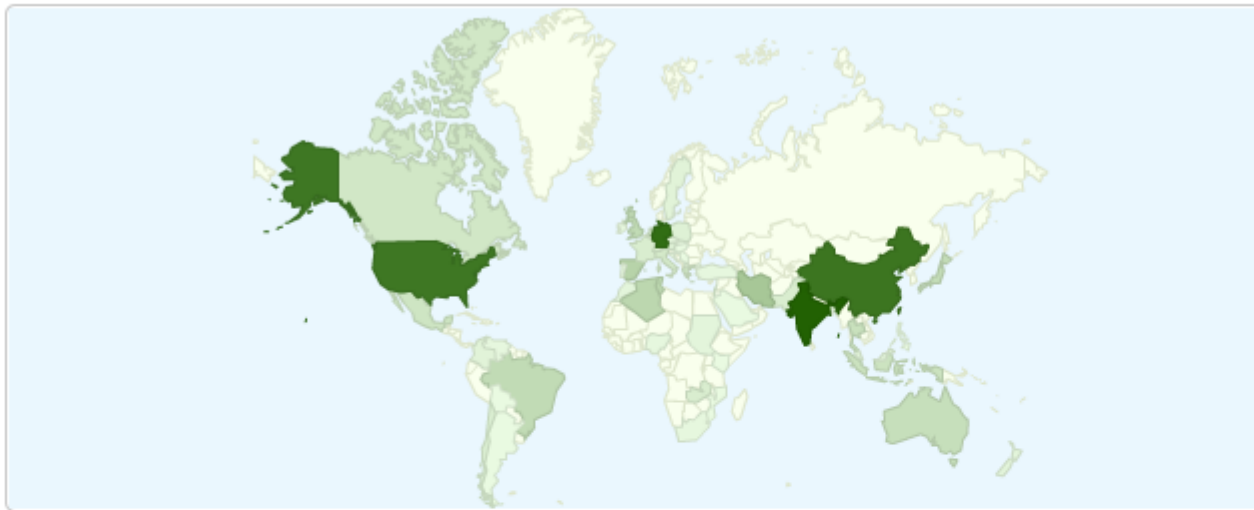
- Most on V2X communication
- Most use SUMO for generating “traces” – vehicle movements – more realistic than random waypoint models
- A small demonstration of Harzing’s “Publish or Perish” (Harzing, A.W. 2010 *Publish or Perish*, version 3.1, available at www.harzing.com/pop.htm)
- Sorry, we do not have a pretty evaluation (yet?)

Some Diploma theses; some usages within PhDs

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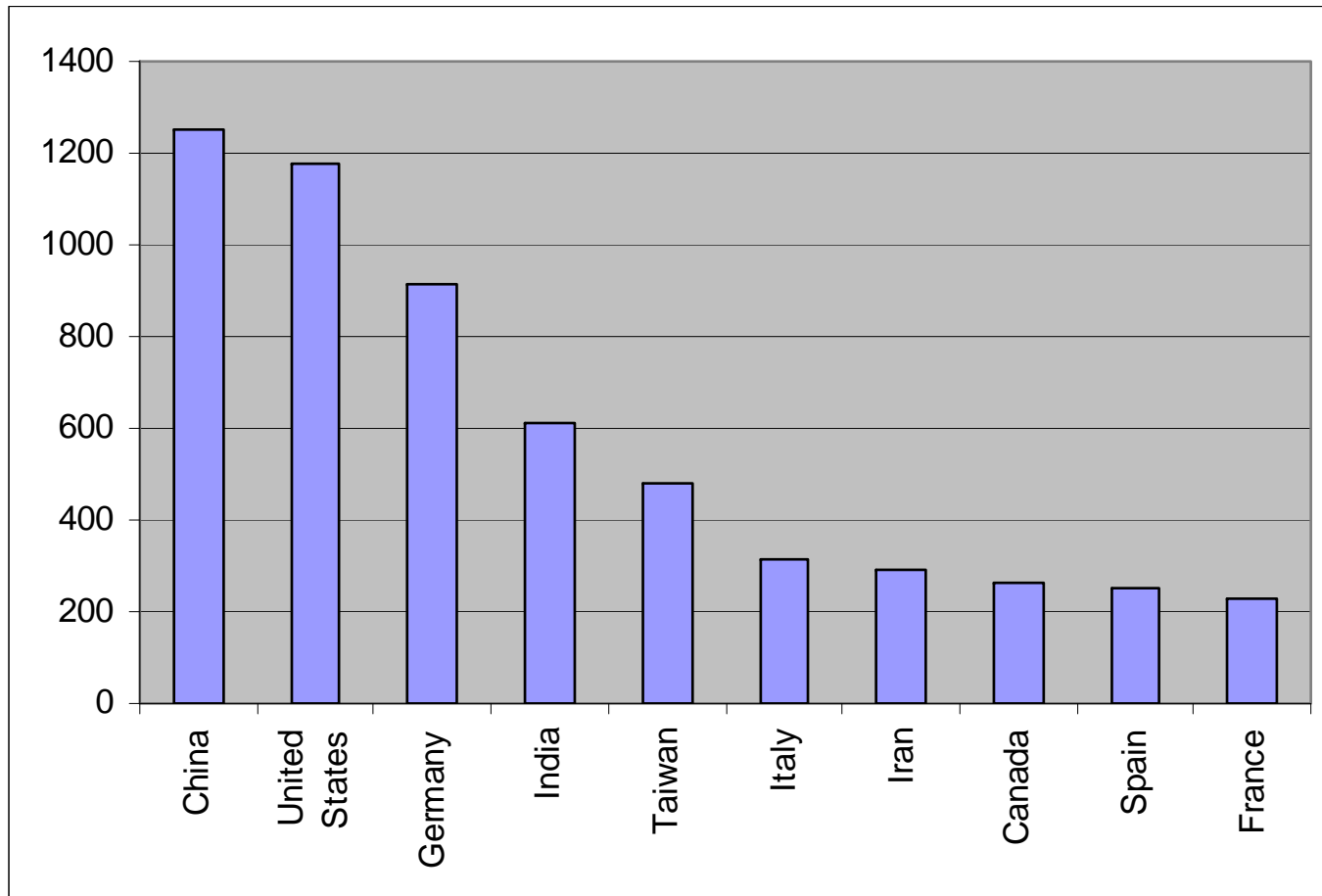
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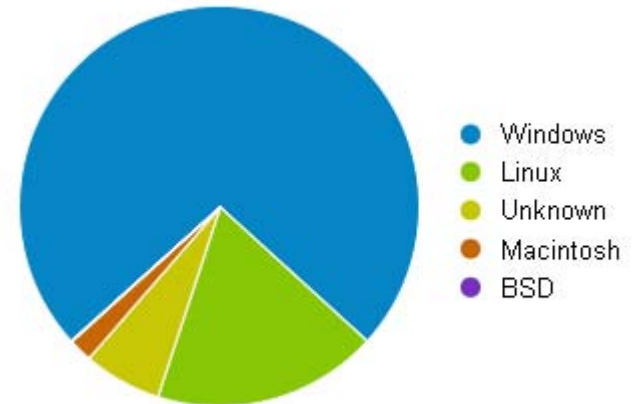
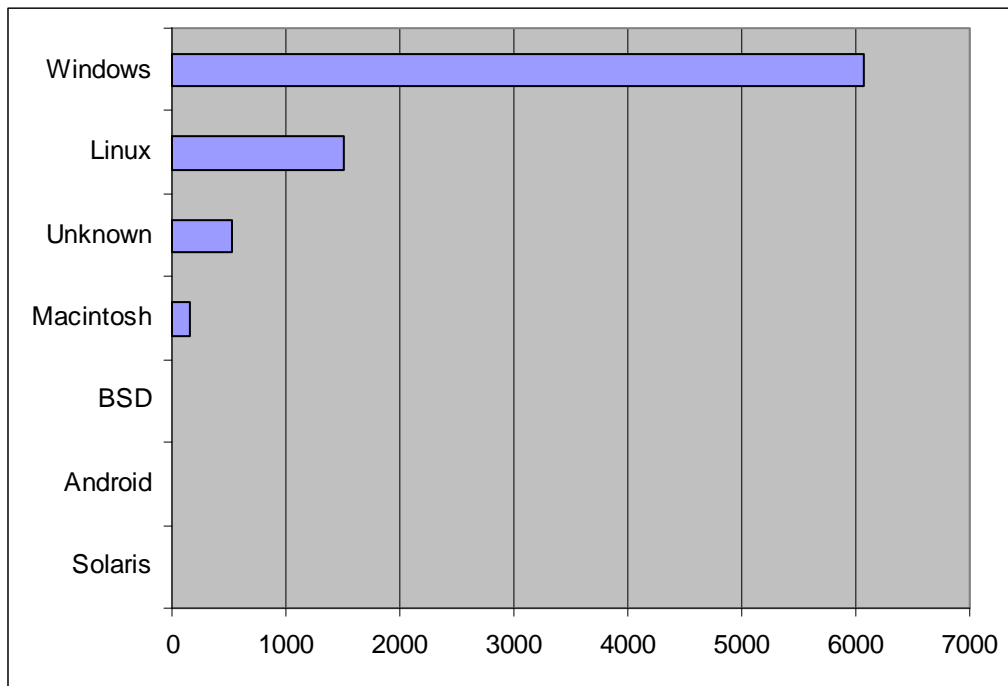
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Downloads – 01.02.2010-01.11.2010, by Country



SUMO – Simulation of Urban MObility

Downloads – 01.2.2010-01.11.2010, by OS



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Fast external usage conclusion

Seems to work for externals, too

- People get their work done
- People can implement own ideas (is extendible)

But

- Only few information about new publications arrive us directly
- Only few talks on traffic simulation theories, mostly on applications' usage only
- Very few code contributions (both extensions and patches)



Workshop

Workshop Concept

Things we are unhappy with or which should be addressed:

- SUMO's visibility
 - Up to now: No advertisement besides mentioning SUMO in publications, no flyers, no partnership, not praising its benefits too loud
- Feedback
 - Many people use SUMO (proved by external publications, mails frequency, and personal talks)
 - But the feedback is very poor
- Progress direction
 - What kind of users do we aim at?
 - In which frame shall the future work take place?
 - What is important, what not?
- Discussion on Development

