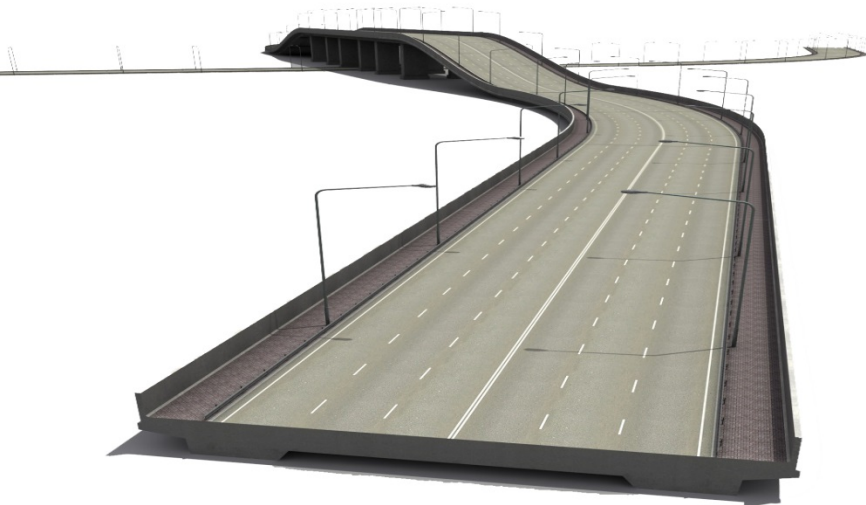

AUTOMATIC GENERATION OF ROAD INFRASTRUCTURE IN 3D FOR VEHICLE SIMULATORS



▶ Bc. Adam Orlický



Parts of presentation

- ▶ Vehicle simulators
- ▶ Options for generating road infrastructure in 3D
- ▶ Plug-in RoadCreator for Rhino



Vehicle simulators

- ▶ Testing human-machine interfaces and vehicle systems
 - ▶ Safety
 - ▶ Exactly defined situations

- ▶ Parts of simulator
 - ▶ Hardware
 - Projection screen
 - Driver compartment (e.g. part of the vehicle)
 - ▶ Software
 - Computing device
 - 3D scene in a virtual environment



Generating 3D road infrastructure

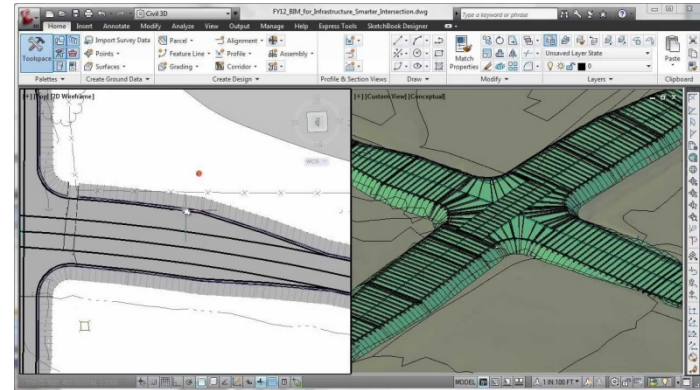
▶ CAD programs focus on road design

Programs

- ▶ e.g. AutoCAD Civil 3D,

Disadvantages:

- ▶ Expensive
- ▶ Problem with export and textures



▶ Separate 3D modeling programs

Programs

- ▶ e.g. AutoCAD 3DS Max, CINEMA 4D, Rhinoceros, Blender, Sketchup

Disadvantages:

- ▶ Problem with generation of road infrastructure



RoadCreator for Rhino

- ▶ Plug-in for generation of road infrastructure
- ▶ Czech standart ČSN 73 6101, technical guidelines
- ▶ Simplification of scenes creation process
- ▶ 54 new functions divided in 5 groups
- ▶ Rhinoceros



Rhinoceros[®]

RoadCreator – User interface

▶ Template

- ▶ Designed for modeling roads (1 unit = 1 m)
- ▶ Two databases with models (trees, traffic signs, bollards)

▶ Toolbar

- ▶ New toolbars for functions
- ▶ Toolbar **ALL**



Road Creator – Function groups

- ▶ **Road 2D**
 - ▶ Contour lines, horizontal alignment, transition curves, longitudinal section, vertical alignment, cross sections...
- ▶ **Road 3D**
 - ▶ Surface of road, road side ditch...
- ▶ **Accessories**
 - ▶ Rail-guards, traffic signs, bollards...
- ▶ **Nature**
 - ▶ Trees, forests, grass...
- ▶ **City**
 - ▶ Intersections, roundabouts, pavements, crosswalks...



Road Creator - Conclusion

- ▶ Simple and fast generation of road infrastructure
- ▶ Roads by Czech standards and technical guidelines
- ▶ Databases which can be enlarged
- ▶ Usable for different purposes





Thank you for your attention!

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