ETH

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SAMSON: Simulation Supported 3D Traffic Environment

Keywords: Visualization, 3D Environment, Traffic Environment, Training Cockpit

Abstract

One of the important factors in an intelligent highway system is a situation-based reactivity, as some intersections otherwise would collapse under the requirements of a high fluctuation during the rush hour. The human being and his potential of comprehension in some situations is the only answer to these challenges. Therefore, we decided to crosslink ongoing CSCW (computer supported collaborative work) research out of the production industry field and the challenges of policemen controlling the traffic on complex intersections. Therefore, we plan to implement a 3D traffic environment which is supported by a discrete event simulation model, which offers training capabilities to augment human responsiveness.

Environment

Today, big cities like Zurich suffer from extensive traffic jams during the rush hour. Hereby, some vital intersections get flooded with an immense quantity of traffic. Usually, these peaks are handled with traffic lights which react on the current situation supported by a wide number of sensors and some basic reaction algorithms. However, some intersections on the other hand get handled by policemen, who control the traffic and react flexible and proactive to occurring peaks compared to some static algorithms. Nevertheless, these algorithms must be defined in a complex design process. Here, the research field of traffic simulation tries to prevent design flaws, and to determine the bottlenecks and the constraints of the system. Above all, there are huge parallels to mass production industry and their efforts to enable a steady flow. However, most traffic simulations are related to strategic planning and optimization processes with the objective to improve the current traffic situation and don't focus on the human being and its potential of comprehension and responsiveness.

Work Packages

- Become acquainted with basic idea
- Literature research in the field of traffic related discrete event simulation
- Conduct traffic measurements at Central in Zurich
- Configure existing simulation model
- Verification and validation of simulation model
- Execute simulation experiments and elaborate optimized system design
- Intermediate as well as final presentation and written report

Support & Additional Information

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