



Investigating Tablet and Pen-Based Virtual Reality In-Situ Authoring for the Education of Urban Rainwater Management

Open Bachelor/Master Thesis

Background

Learning urban rainwater management is essential for civil engineers. They need to understand how infiltration takes place on a wide variety of surfaces and how rainwater drainage must be regulated to prevent flooding. At the moment, the courses are based on the theoretical laws of physics. Virtual reality offers the possibility to create virtual environments that impressively illustrates these laws and support the learning process.

Research Goal

The aim of this thesis is to design and create with a game engine a tablet and pen-based virtual reality in-situ authoring application that could be used by lecturers to design immersive urban rainwater management scenarios. It will be based on the publication VRSketchIn. The focus will be on the iterative development of an interaction design concept by using a user-centered design process. The implemented application should be evaluated in a usability study.

Based on bachelor/master level the scope is adapted.

Tobias Drey
Institute of Media Informatics
Room: O27 / 336

tobias.drey@uni-ulm.de



Initial Related Work

T. Drey, J. Gugenheimer, J. Karlbauer, M. Milo and E. Rukzio, "VRSketchIn: Exploring the Design Space of Pen and Tablet Interaction for 3D Sketching in Virtual Reality" , *Accepted to Proc. of CHI 2020 (SIGCHI Conference on Human Factors in Computing Systems)* , Apr. 2020.

Surale, H. B., Gupta, A., Hancock, M., & Vogel, D. (2019, May). TabletInVR: Exploring the Design Space for Using a Multi-Touch Tablet in Virtual Reality. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1-13).

Arora, R., Habib Kazi, R., Grossman, T., Fitzmaurice, G., & Singh, K. (2018, April). Symbiosissketch: Combining 2d & 3d sketching for designing detailed 3d objects in situ. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (pp. 1-15).