

## Software Lab:

Modeling: ★★☆☆☆  
Mathematics: ★★☆☆☆  
Programming: ★★★★★

# Interactive Flood Simulation

## Setting

Flood events, especially in alpine areas, happen quite frequently and have a strong impact on human welfare, agriculture, and industry by flooding large areas of nearby terrain. Hence, any prediction based on measured data (rain fall, water level of rivers etc.) is inevitable in order to minimise human and economic damage in those areas.

For the region around the Dornbirner Ache (Vorarlberg, Austria) very detailed GIS data exist, that allow for qualitative flood simulations [1]. Therefore, a computational model has to be derived from these GIS data, that serves as input for both a 2D shallow water and a full 3D flow simulation. In addition to geometry, the computational model has to contain information such as soil properties etc.

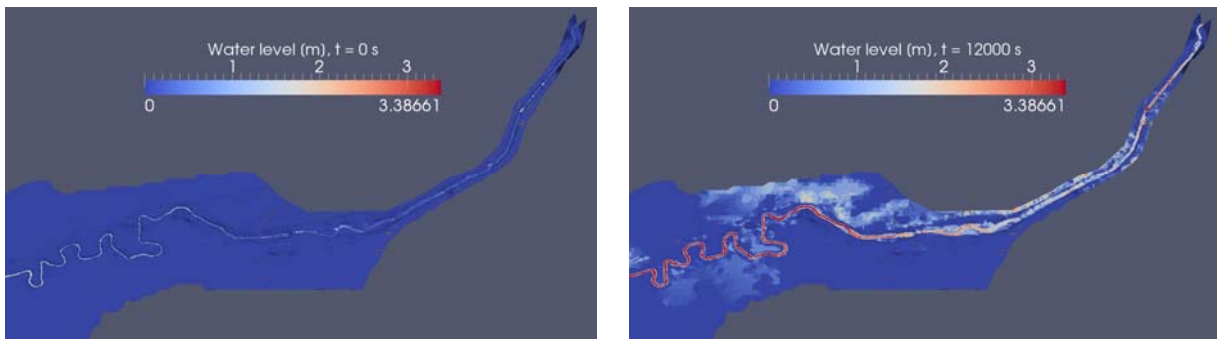


Fig. 1: Visualisation of water level

## Task

- import GIS data to VA framework [2] for further processing
- generate computational grid from imported GIS data
- carry out several simulation runs with 2D shallow water and 3D fluid codes and make a qualitative comparison of the results obtained
- main task: Extend your approach for an interactive treatment, i.e. users can manipulate certain parameters (boundary conditions etc.) during runtime and get immediate feedback

## Supervisors

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## References

[1] M. Jud, F. Schwertfirm, C. Rapp, D. Bierhance, M. Schilcher, M. Manhart:

Coupling of GIS and Hydraulics using the example of the Dornbirnerach, ESRI User Conference 2011, San Diego, 13.07.2011

[2] [http://www.mac.tum.de/wiki/index.php/Project\\_K2](http://www.mac.tum.de/wiki/index.php/Project_K2)