Chair for Computation in Engineering
Chair of Computational Modeling and Simulation

Software Lab:

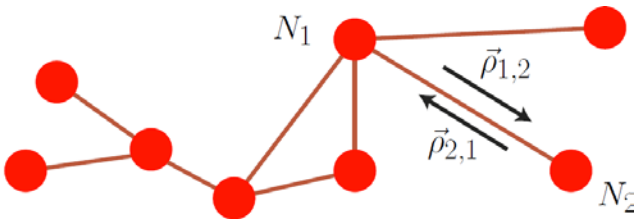
Modeling: ★★★☆☆
Mathematics: ★★★★★
Programming: ★★★☆☆

Liquid Humans - A pedestrian simulator based on fluid dynamics

Setting

Sixty years ago, the LWR-model was developed to describe the traffic flow on highways [1, 2]. The model is mainly based on the well-known continuity equation.

This traffic flow model was adopted from the area of pedestrian dynamics simulations to describe the behavior of large human crowds [3].



In this software lab project you will build this macroscopic pedestrian dynamic model from the scratch. To show the results of your hard work, you will develop a small visualization tool. Both parts of the projects will be done in Java.

Tasks

- implement a pedestrian dynamics simulator based on the LWR-Model in Java
- develop a visualization tool to show the flow of pedestrians in Java

Supervisors

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References

[1] M. J. Lighthill, G. B. Whitham, On Kinematic Waves. II. A Theory of Traffic Flow on Long Crowded Roads, *Proceedings of the Royal Society A*, 317-345, 1955.

[2] P. Richards, Shock waves on the highway, *Operations research,* 42-51, 1956

[3] R.M. Colombo, M.D. Rosini, Pedestrian flows and non classical shocks, *Mathematical Methods in the Applied Sciences,* 1553-1567, 2005