



University of Stuttgart  
SFB 716

# Colloquium of the SFB 716

November 15<sup>th</sup>, 2018 | 4 pm

University of Stuttgart  
Campus Vaihingen  
Allmandring 3  
Room 1.079

The Collaborative Research Center (SFB) 716 invites to the upcoming colloquium. In this lecture series guest speakers and members of our subprojects inform about their results regarding the dynamic simulation of systems with large particle numbers.

## TALK

Prof. Dr.-Ing.  
Lars Linsen

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## Comparative Visual Analysis of Particle Simulation Ensembles

Traditional visualization methods for time-varying volume data use volume visualization for the investigation of individual time steps of a simulation run, possibly animated over time to show the temporal evolution. For comparative visual analysis of multiple simulation runs within an ensemble such an approach is neither effective nor efficient. Instead, aggregated information needs to be extracted and visually conveyed at an overview level.

We present an interactive visual analysis approach for spatio-temporal simulation ensembles using multiple coordinated views of different aggregation levels. Our approach allows for an overview of the ensemble's data value distributions, the detection of main events within the simulation ensemble, a comparative view of the evolution of all simulation runs within the ensemble, the investigation of simulation

parameters on the simulated output, the detection of patterns and outliers within the ensemble, and the investigation of spatial distributions of detected features. We demonstrate the effectiveness of our approach by applying it, among others, to particle simulation ensembles based on smoothed particle hydrodynamics.