

## CELEST Member Short Profile



### Volker Schmidt


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Volker Schmidt is professor at the Institute of Stochastics of Ulm University. In numerous collaborations with partners from physics, chemistry, materials science and process engineering, he develops mathematical methods, which are applied to multi-scale analysis, modeling and simulation of the 3D morphology of advanced functional materials. Particular emphasis is put on the quantification of process-microstructure-property relationships, e.g., for mass and charge transport in porous and composite electrode materials, as well as on statistical 4D analysis and modeling of structural degradation processes. The general goal is the virtual model-based design of improved materials with optimized morphologies and properties.

#### Institute of Stochastics

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#### Research areas

The areas of current research interests of Prof. Schmidt include *pre-processing techniques for large image data* (in particular segmentation and skeletonization algorithms, statistical learning and neural networks), *methods of spatial statistics* (for the statistical analysis of highly resolved image data on various length scales in 2D, 3D, and 4D) and *stochastic geometry* (for data-driven modeling and predictive simulation of the 3D morphology of functional materials).

#### Lab equipment

State of the art hardware (HPC Linux-Cluster, high-end Client/Server), mathematical and image processing software (for data analysis, stochastic microstructure modeling and machine learning)

#### Volker Schmidt @ Institute of Stochastics

<http://www.uni-ulm.de/stochastik>

Partners

