



北京大学前沿计算研究中心  
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学术报告

# Measuring Collective Behaviour – a computational approach

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**Abstract:** Social animals often show extremely complex swarm behaviour even though their individual mental capacity is limited. But also extremely harmful and stupid behaviour of groups can be observed. In many cases, however, it is unclear how swarms form and synchronize. With the help of computer science, the new cluster initiative “Centre for the Advanced Study of Collective Behaviour” at the University of Konstanz (Germany) is dedicated to research on collective behaviour, from swarm intelligence of animal groups and human decision-making processes to economic networks. It is a collaboration between the University of Konstanz and two units of the Max Planck Institute for Ornithology. The research cluster utilizes state-of-the-art sensor systems such as the space-based ICARUS module for tracking animal movements and will be based in the cutting-edge “Centre for Visual Computing of Collectives” (VCC) that is currently being built in Konstanz. It combines expert knowledge from the fields of biology, social psychology, behavioural economics as well as computer science. As computer scientists we will develop new methods for precise tracking, behavioural descriptions, intelligent data analysis and virtual reality simulations for different animals. Extremely complex spatio-temporal data has to be processed and visualized, reactive high-speed algorithms are needed to interactively react on flying animals in our lab experiments. In my talk I will give an overview of the planned centre and sketch our research foci.

**Biography:** Prof. Deussen graduated at Karlsruhe Institute of Technology and is currently professor at University of Konstanz (Germany). He serves as a visiting professor at SIAT Shenzhen (Chinese Academy of Science), in 2014 he was awarded within the 1000 talents plan. He is Vice-President of the Eurographics Association and served as Editor in Chief of Computer Graphics Forum from 2012-2016. His areas of interest are modeling and rendering of complex biological systems, non-photorealistic rendering as well as information visualization. He also contributed papers to geometry processing, sampling methods, and image-based modelling. As one of the three speakers of the newly funded “Centre for the Advanced Study of Collective Behaviour” (German Excellence Initiative) he is responsible for computer science research in understanding collective behaviour.

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