Project Description PhenoRat P4, Malte Lorbach

Social behaviour is a well-studied topic in animal research on anxiety, aggression, stress, and neuropsychiatric and neurodegenerative diseases (such as Huntington's Disease). Automated assessment of rodent social behaviour will substantially advance these research areas as long-term observations can be done cheaper and more accurately compared to human scoring of social behaviour. Current automated behaviour analysis systems, however, do not allow reliable classification of social activities among multiple rodents.

The desired outcomes of the research are new statistical methods and algorithms to facilitate the analysis of the sequential structure of rodent behaviour and the selection of relevant behavioural parameters in large data sets, in order to detect biologically relevant phenotypes. These statistical procedures and algorithms will be further developed into software tools that can be applied to automatically detect the early functional signs of pathophysiology in animal models for neurodegenerative diseases, and to automatically analyse particular sequences in rodent behaviour, which can be indicative of compulsive behaviours or stereotypes.

To validate the developed statistical methods, they will be tested on behavioural data on transgenic rat models of Huntington's disease and SCA17 obtained by fellow researchers.