

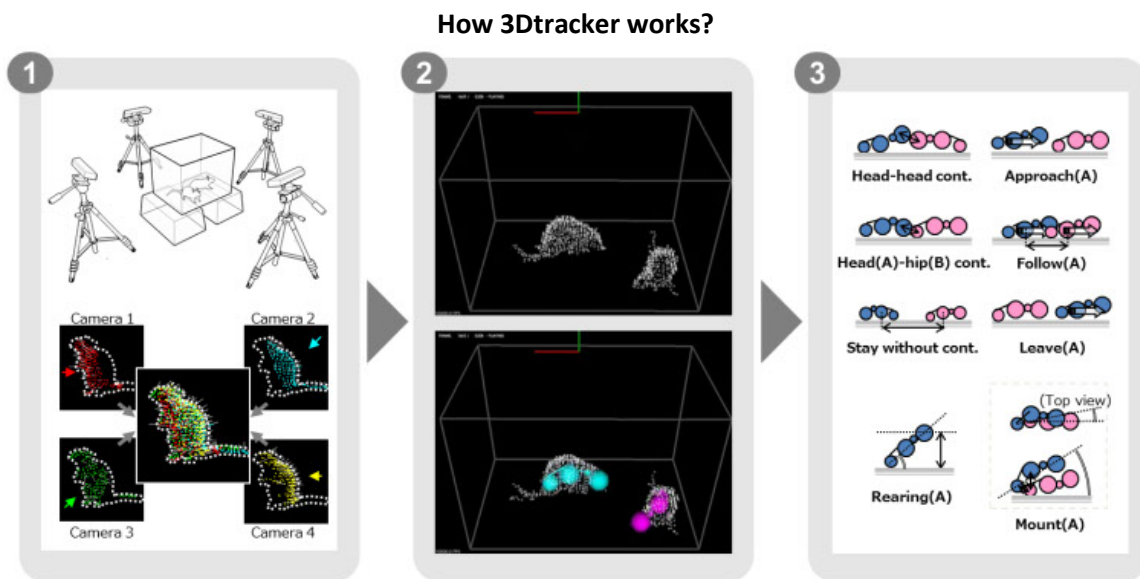
Diploma thesis topic:

Neuronal coding of social recognition in rats

Social recognition, the ability to identify a known member of the same species, is an essential aspect of life. Despite the enormous importance of social memory, it is still unclear how neural circuits encode this function. The key role of the hippocampal CA2 region has been demonstrated recently. In particular, it is unknown whether and how hippocampal PV+ interneurons in the CA2 area contribute to social memory. We will combine chemogenetic manipulations with 3D tracking of rats, which allows us to study in detail the social interactions of rats after affecting the excitability of a specific population of cells.

The project will be carried out in the **Laboratory of Neurophysiology of Memory, Institute of Physiology, Czech Academy of Sciences**. The project involves implementation of a 3D tracking system (<http://www.3dtracker.org/>), hands on work with rats, stereotaxic surgeries. Interested students can feel free to get in touch with Dr. David Levčík (david.levcik@gmail.com).

Essential: Ability to work independently and troubleshoot technical issues, basic experience with computer programming (e.g. Matlab, Python).



Matsumoto et al., 2013 (<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0078460>)

- 1) A 3D video is reconstructed from the images of multiple (4) depth cameras.
- 2) Positions of body parts are estimated by fitting skeletal models to the 3D videos.
- 3) Various behaviors are automatically detected based on the trajectories of body parts.

Why 3D?

Three-dimensional video based behavioral analyses greatly contribute to various experiments and analyses, which have been difficult in 2D video-based analyses. For example: robust tracking of overlapped animals (e.g. social interaction), estimation of detailed 3D postures.

Credit: <http://www.3dtracker.org/>