Student project in spatial cognition

The influence of sleep on orientation and navigation

Background. Spatial navigation is a complex process that includes the integration of different sources of information and involves different memory systems. Semantic structures can form superordinate patterns that are not defined at the level of distances and directions but rather arise from the semantic context of each location, e.g. *downtown* or *university campus*. Research has shown that such semantic structures can bias spatial decisions in a way that leads to a preference for one route alternative over the other.

Project. In this project, the effect of sleep on the abstraction and consolidation of knowledge about the general layout of an environment will be investigated in a virtual reality, displayed with the Oculus Rift Head-Mounted Display. Route knowledge is tested with navigational tasks. The participants have to perform two sessions of wayfinding tasks. Sleep is manipulated through the durance and the time of retention intervals. The influence is assessed with the learning curves over all test routes.

Methods. MatLab programing, statistical analysis
Level. The project is currently planned as a BSc-project. Extension to a MSc-project is possible.
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References

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Wiener JM, Mallot HA: 'Fine-to-Coarse' Route Planning and Navigation in Regionalized Environments. *Spatial Cognition and Computation* 3(4): 331–358, 2003

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