Description of the project

In the Industry 4.0 the need for automation increases tremendously and thus the demand for robots with high navigation abilities in complex three-dimensional surroundings grows vastly. Especially deep learning allows an efficient approach to achieve this. Savinov *et al.* [1] used an animal inspired non-metric (Gillner & Mallot, Foo *et al.*)[2, 3] semi-parametric topological memory (SPTM) approach. With this approach, they were able to improve their success rate by a factor of three compared to their baselines. Our team will evaluate further tensorforce based baselines which follows the same evaluation procedure as introduced by Savinov *et al.* [1] and will allow to put their work on an even more solid foundation.

1 Savinov, N., Dosovitskiy, A., and Koltung, V.: ‘Semi-Parametric Topological Memory for Navigation’, ICLR 2018

2 Gillner, S., and Mallot, H.A.: ‘Navigation and acquisition of spatial knowledge in a virtual maze’, J. Cogn. Neurosci., 1998, 10, (4), pp. 445-463

3 Foo, P., Warren, W.H., Duchon, A., and Tarr, M.J.: ‘Do humans integrate routes into a cognitive map? Map- versus landmark-based navigation of novel shortcuts’, J. Exp. Psychol.-Learn. Mem. Cogn., 2005, 31, (2), pp. 195-215