Interdisciplinary Project

Graph Neural Networks to improve Offline and Online Tracking Algorithms

Extraction of player and ball tracking data is essential in every kind of team sports analysis for researchers and practitioners. This allows us to compute performance indicators of players to help improve their performance and start load management. Furthermore, it helps to compute advanced statistics in competition games. As video cameras are available more and more, high dimensional and storage extensive video data can be generated. This data needs to be transferred in low dimensional tracking data, as most of the data is useless.

Project

Currently, a software for performance analysis is developed, which extracts tracking data from video. The software can annotate and correct wrong predictions and works with generic trackers as well as tracking by detection methods. The task of this IDP is to:

- Accumulate tracking data of a specific sport (Tennis, Ultimate Frisbee, Soccer...)
- Improve detection and ReID network (Currently YoloV5 and TorchReID)
- Implement a graph association network to reduce ID-Switches

Applicants should have experience in:

- Basic Computer Vision and Deep Learning
- Interest in Graph Neural Networks
- Fluent Python
- Qt - Experience (Not mandatory)

Courses

Participation in the following courses is recommended.

- Principles of Exercise Science 1 (V, 2 SWS)
- Principles of Exercise Science 2 (V, 2 SWS)

Time frame

The work should start as soon as possible and should be finished before the examination phase in February or March 2022. If you are interested, please send an email to marc.s.schmid@tum.de