Chair of Communication Networks
TUM Department of Electrical and Computer Engineering
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Forschungspraxis

Mobile user trajectory prediction using Machine Learning methods

The task is to predict the trajectory (or path) of a mobile user using some machine learning algorithms (e.g. reinforcement learning or recurrent neural networks). Using this information one can then use this for eg. In LiFi to predict when the moving user will block the light for another user. Or eg. In 5G to predict when to perform handovers.

The tasks are:

1. Create the training dataset by implementing an existing mathematical mobility model using Python (SLAW model).
2. Use multiple learning techniques to predict the trajectory of a mobile user
3. The goal is to compare the learning techniques to see how good the prediction can be and in which applications they can be used and how this would impact handovers in LiFi and 5G.

Related work:

Lee, K., Hong, S., Kim, S.J., Rhee, I. and Chong, S., 2009, April. Slaw: A new mobility model for human walks. In IEEE INFOCOM 2009 (pp. 855-863). IEEE.

Gebrie, H., Farooq, H. and Imran, A., 2019, May. What machine learning predictor performs best for mobility prediction in cellular networks?. In 2019 IEEE International Conference on Communications Workshops (ICC Workshops) (pp. 1-6). IEEE.

Prerequisites

- Python knowledge
- Knowledge in machine learning algorithms (especially RNNs)
- Interest in learning about mobility models

Advisors

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