

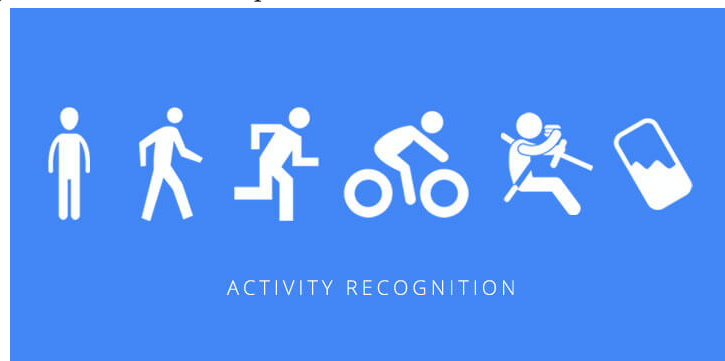


Prof. R. Wattenhofer

## Activity Recognition and Adversarial Learning with Smartwatches

Smartwatches are getting more common and sophisticated. They include an array of sensors, and can sometimes even measure your heart rate and position.

We have done projects using smartwatches to recognize movements and count repetitions for swimming and cross-fit. Depending on your interests, we could continue these projects, or come up with new applications and challenges. We would like to hear your ideas as well!



We are also interested in investigating activity recognition in

the context of adversarial learning, i.e., how can we alter the inputs to cause the classifiers to mispredict. Can we come up with a principled way to generate movement patterns that, when performed by humans, will fool the activity recognition? If so, what can we do to make the recognition more robust?

If any of this sounds interesting to you, do not hesitate to contact us.

**Requirements:** Knowledge in Deep Learning, or solid background in Machine Learning. Implementation experience is an advantage. You should be able to read and understand the first 12 chapters of the "Deep Learning Book" by Goodfellow et al. (available for free online from MIT press). If you are interested in the topic but new to deep learning we expect you to complete an introductory deep learning course before applying for the thesis, such as Andrew Ng's coursera course (use the free trial!)<sup>1</sup> or this Udacity course<sup>2</sup>.

### Interesting Papers:

- If you are interested, we can provide you with a list of interesting papers to get you started.

**Interested? Please contact us for more details!**

### Contacts

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<sup>1</sup><https://www.coursera.org/specializations/deep-learning>

<sup>2</sup><https://classroom.udacity.com/courses/ud730>