



Towards Real World Activity Recognition from Wearable Devices

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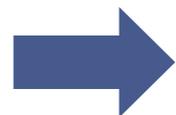
1. Motivation

Motivation

Supporting and observing elders in everyday activities

Typically, ...

- wearable device are used to recognize physical activities
- smart-environments are the base for recognizing ADLs



physical activities are often insufficient, smart-environments are usually restricted to a specific area

Beside, ...

- many existing studies are conducted in a (highly) controlled environment  real-world feasibility is unclear

2. Research Question

Research Question

Our aim is to develop robust activity recognition methods based on wearable devices ...

In this context, ...

- To what degree is it possible to reconstruct/recognize the daily routine?
- Is it possible to create a generic model where we can abstract from to reduce the training effort of a new patient?
- Which activity level is sufficient?

We focus on recognizing physical human activities but also to deduce the actual performed high-level activity

3. Related Work

Related Work

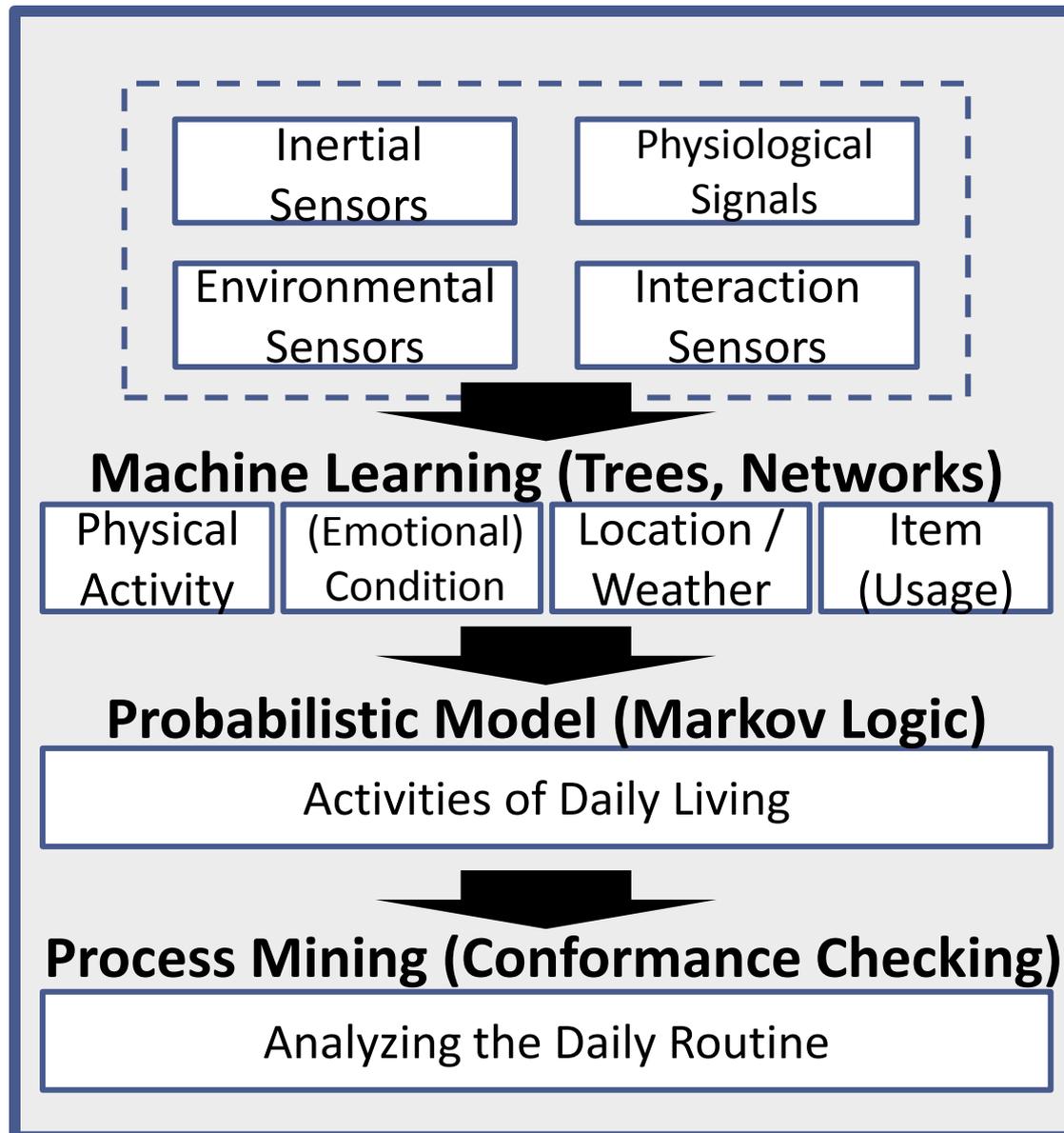
- Several researchers already investigated HAR [1][2] ...
 - ➔ aspects as device position, environmental influence, changing user behavior, cross-subjects are often ignored
- Smart-homes get also a lot of attention [3][4] ...
 - ➔ often restricted to a single person, outdoor activities are not targeted, level of activity varies

Besides, ...

- mass distribution of wearable devices leads to a shift to real world applications
 - ➔ new and unaddressed problems arise

4. Approach

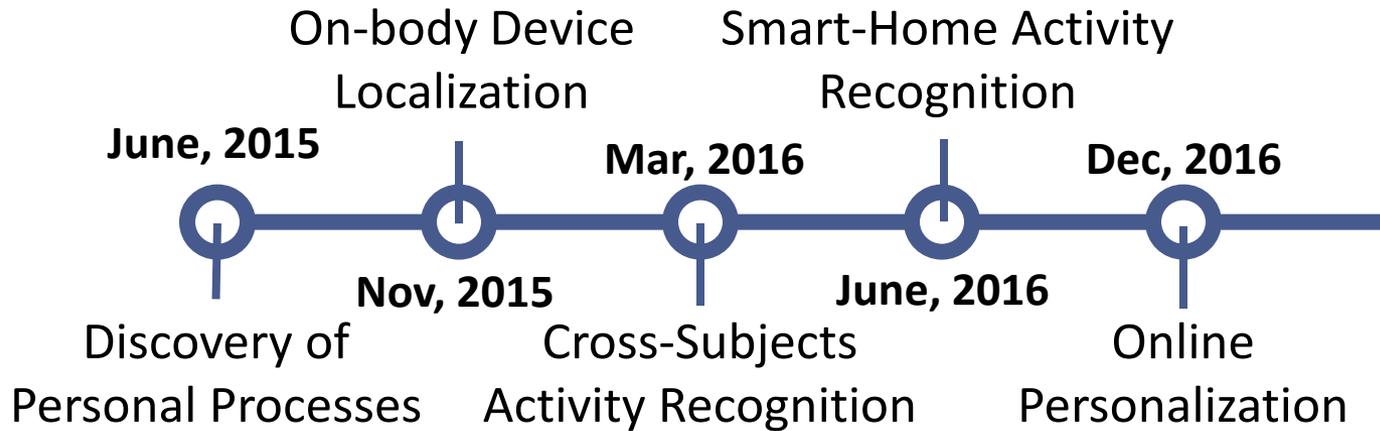
Approach



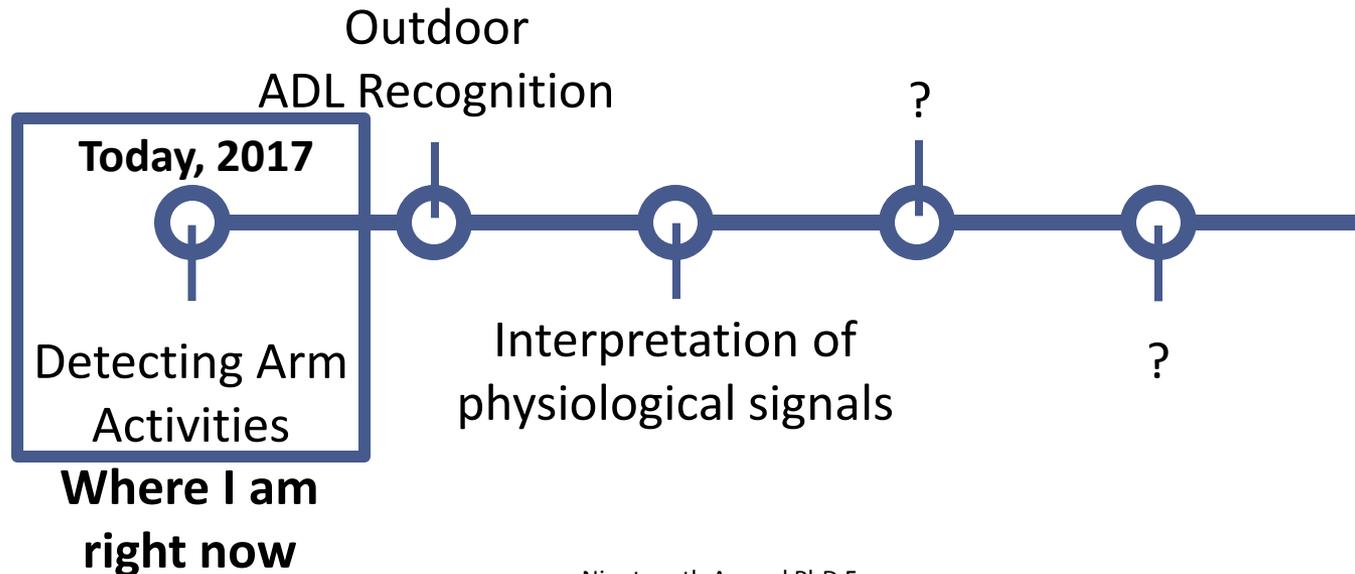
5. Research Plan

Research Plan

What did I do



What do I plan



6. Conclusion

Conclusion

We want, ...

- Supporting and observing elders in everyday activities

So far, ...

- focused on device position and its influence
- investigated the feasibility of a general cross-subjects model
- data collection effort vs. online/active learning
- reconstructing ADLs based on sensor events (Markov Logic)

Future work, will be ...

- to distinguish arm movements (e.g. eating vs. take medicine)
- to recognize outdoor activities (acquiring background knowledge, probabilistic model)