

Algorithm development for activity tracking

Thomas Rahimi,
LKV Baden-Württemberg



Contents

- Challenges in activity tracking
- Possible Solution
 - Decision Tree
 - Hidden Markov Models
 - Support Vector Machine

Challenges in activity tracking

- Near realtime evaluation required
 - Quick evaluation method required
- Continuous data stream
 - Impossibility to foresee the future
- No „normal“ activity level → calibration of data not possible
 - Individuality of all animals, but still common patterns

Decision Tree Modelling

- Definition of thresholds for classification from metric data
 - Thresholds may vary between different animals
- Fitting of model to data possible → linear fitting
 - Extensive fitting undoes the advantages of the model's simplicity

Hidden Markov Model

- Probabilistic approach for sequential data
 - Maybe more data required
- Probability for change between sequences required to fit model
 - More calculation time consuming
- Return state of the modelled entity

Support Vector Machine

- Multi-class SVM required – More calculation time consuming
- More general machine learning approach → Generalization to minimize loss function
- Implementation with three-axis accelerometer already proven (Martiskainen et al. 2009)

Thank you for your attention
Are there any questions?