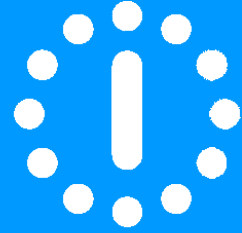


sheldon



smart habitat
for the elderly



Funded by the H2020 Framework Programme
of the European Union

This publication is based upon work from COST Action CA16226: Indoor Living Space Improvement: Smart Habitat for the Elderly, supported by COST (European Cooperation in Science and Technology).

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

www.cost.eu

www.sheld-on.eu

Course:

Datasets and PreProcessing in AAL

Lecture 1:

Introduction to AAL

Ambient Assisted Living

- Help primarily elderly adults in everyday life
 - Help maintain independence longer
 - Help maintain health, activity
- AAL systems can help disease management and perform alarm alerting, behavior change alerting
- AAL system tasks:
 - Monitor medication adherence
 - Monitor diet adherence
 - Track sleeping time
 - Fall detection and alerting
 - Alerting in case of environmental danger
 - Behavioral change tracking to help early detection of neurodegenerative diseases



Sensors in AAL Systems

- Data from heterogeneous sensors and additional self-reported data to get new information regarding physiological, psychological, emotional, and environmental states
- Sensors can be differentiated based on:
 - Whether they're used indoors or outdoors
 - Whether they're used in a private or public environment
 - Whether the people using them are healthy, ill, disabled
- Sensors can monitor:
 - Vital signs: heart rate, blood pressure, pulse oximetry, blood glucose level, body temp, respiration rate
 - Environment: temp, smoke, light
 - Behavior: body accelerator, body orientation, physical movement
 - Outdoors: movement, routes



Sensors in AAL Systems

- Accelerometer, gyroscope and magnetometer for postural stability
- Smartphone, with all of its sensors
- Sensors for ambient air monitoring
- RFID tag for 3d localization (wearable)
- RF sensors for sleep, activity monitoring, changes in movement patterns (environmental)
- Sensors in surfaces to recognize hand signals
- Sensors in beds to track resting time
- Sensors in environment for temperature, humidity
- Sensors in appliances for activities, abnormal behavior detection, help with e.g. food preparation
- Carbon monoxide detectors, smoke detectors, gas leak detectors



Data from AAL Systems

- Variety of technologies leads to a greater complexity of data
- Use of various features to recognize complex functionalities
- Artificial intelligence and especially machine learning can be used to analyze data
- For better and more successful application of ML, the data has to be preprocessed
 - Feature selection
 - Dealing with inconsistencies
 - Standardization



sheldon



smart habitat
for the elderly



Funded by the H2020 Framework Programme
of the European Union

This publication is based upon work from COST Action CA16226: Indoor Living Space Improvement: Smart Habitat for the Elderly, supported by COST (European Cooperation in Science and Technology).

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

www.cost.eu

www.sheld-on.eu