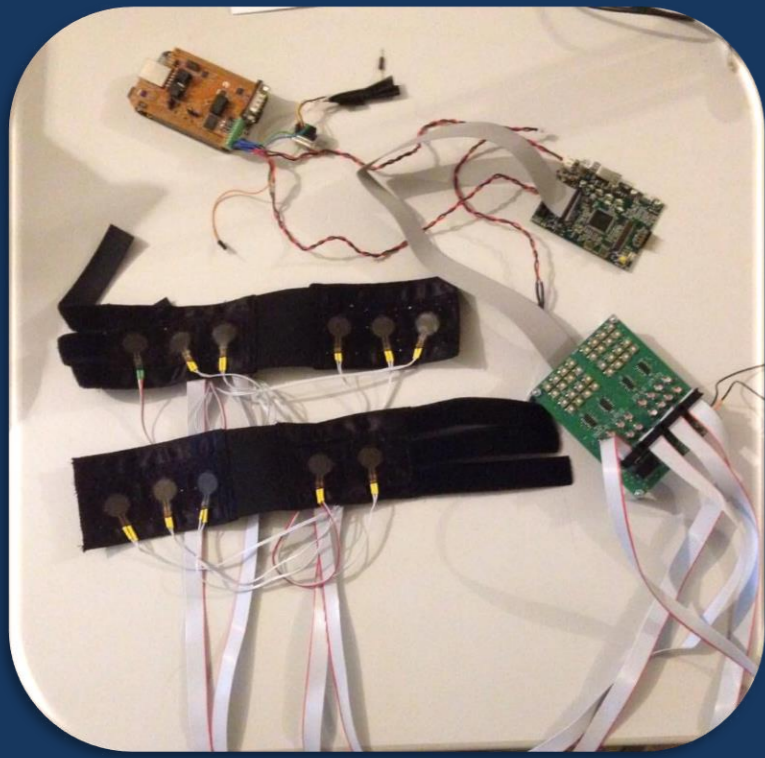


Learning algorithms for sensor interpretation on an exo-skeleton

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Master of Electronics and ICT Engineering

Introduction

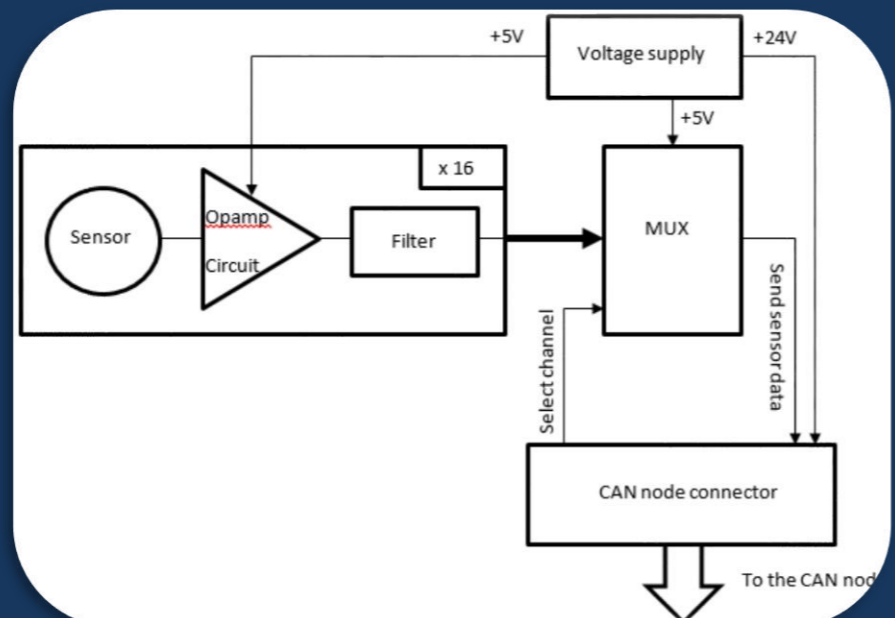
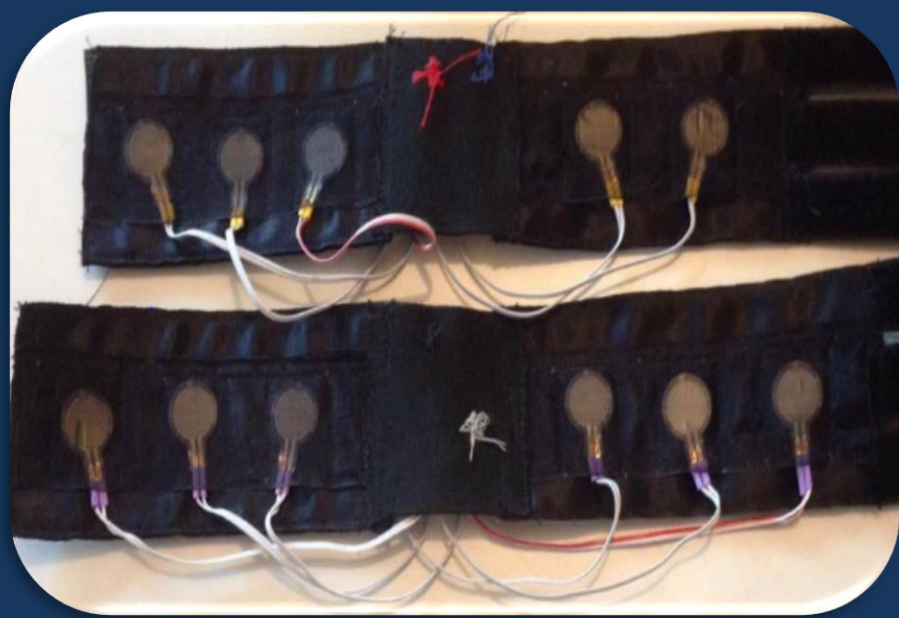


- Problem: The adjustment of the arm of the exo-skeleton to a person is carried out manually which takes a long time.
- Possible solution: add two human intention detection sensor belts containing 11 channels.
- Goal: with machine learning, develop a short learning period so an algorithm can accurately detect human movement.

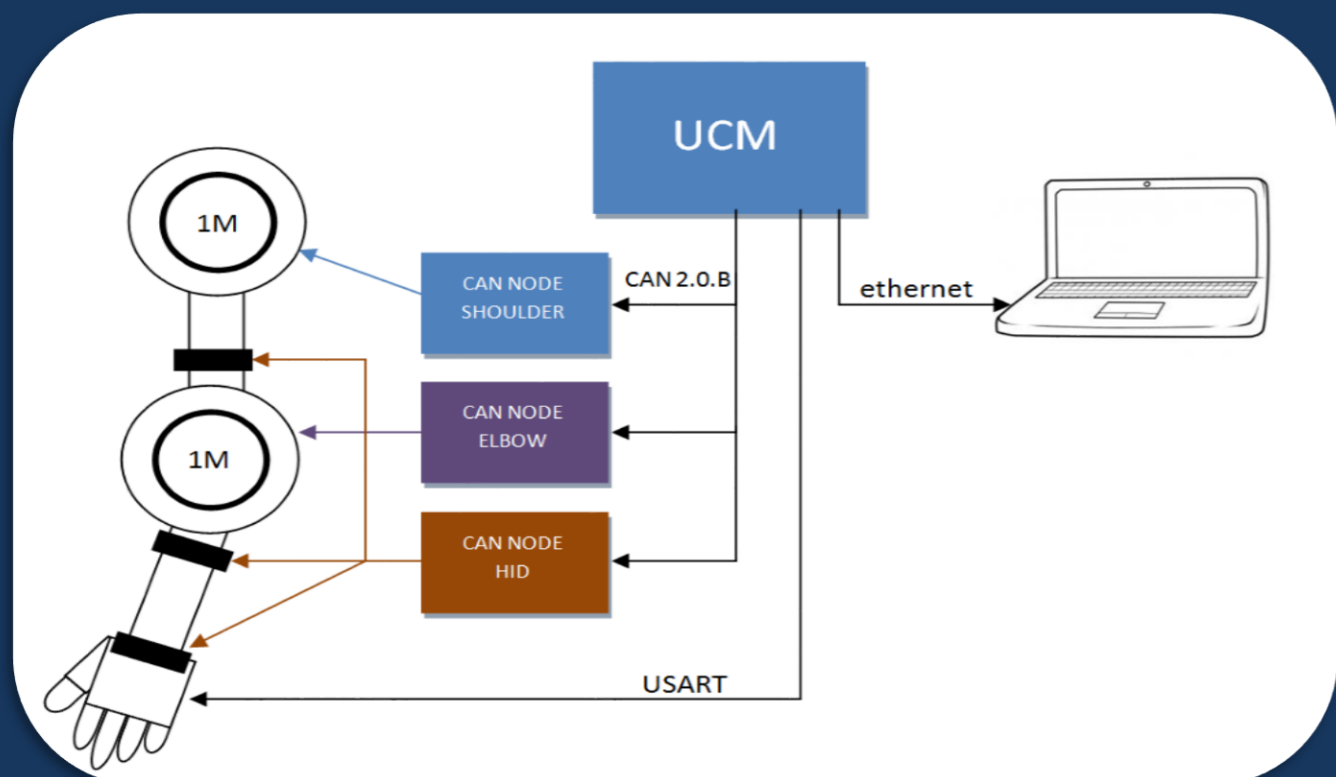


Data gathering

- Sensors: Force sensitive resistors



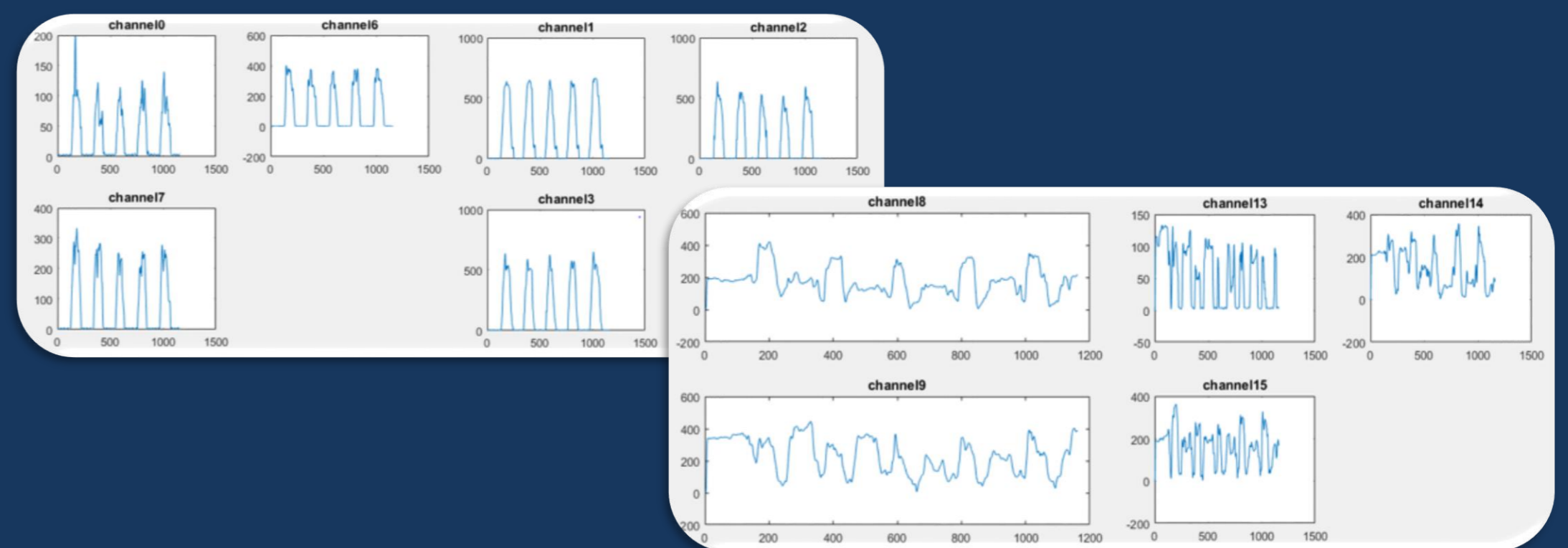
- Communications: CAN Bus with CAN bus listener



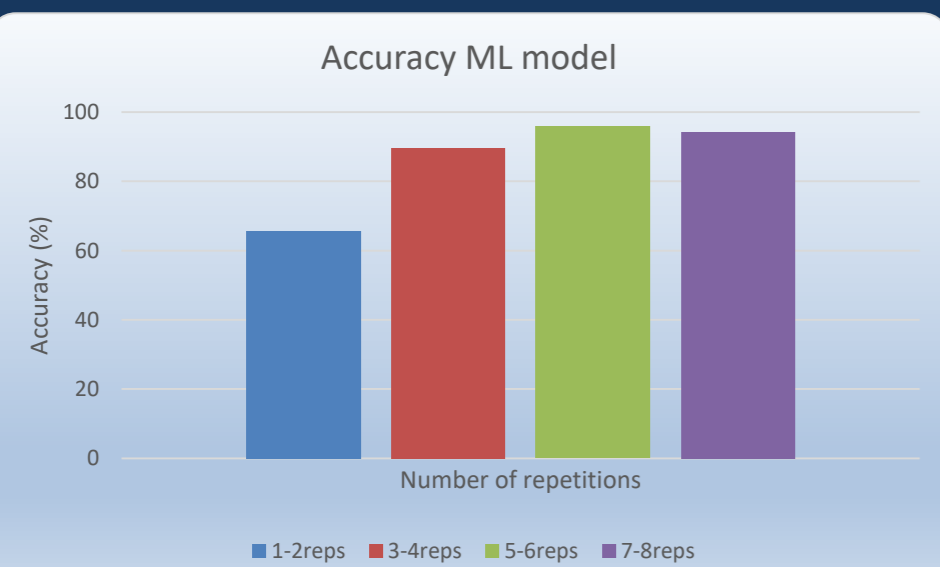
Machine learning

Questions that were answered:

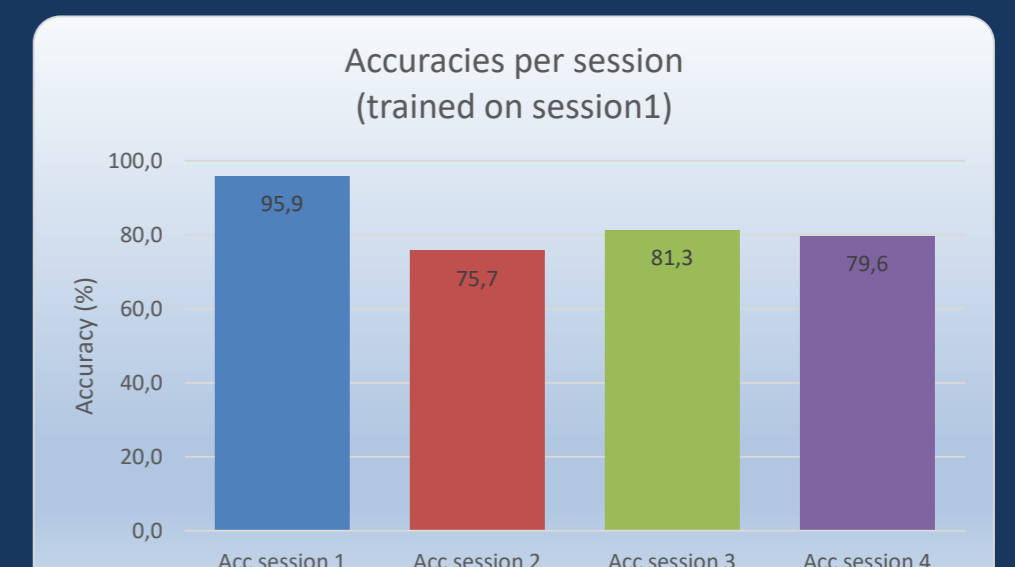
- Which machine learning algorithm performs best to classify arm movement?
- Which exercises are most useful?
- How many times an exercise needs to be performed?
- How many different exercises are needed?
- Is the machine learning model person specific?
- Can models be reused after taking the suit off?



Results



- Sensor belts can detect human arm movement
- Collecting data with CAN bus listener is implemented
- Machine learning models are person specific
- A relatively short learning period is available



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