Politecnico di Torino
Dipartimento di Automatica e Informatica

PhD in Computer and Control Engineering
35 cycle

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A computational approach to the diagnosis, characterization, and follow-up of neurodegenerative diseases

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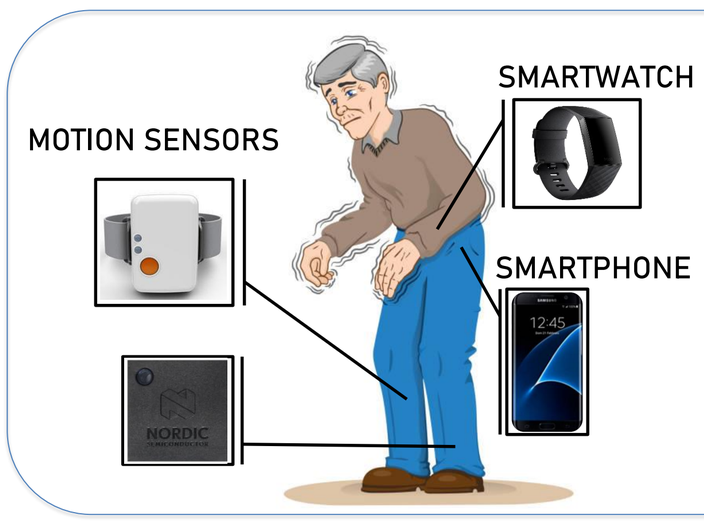
1. Background

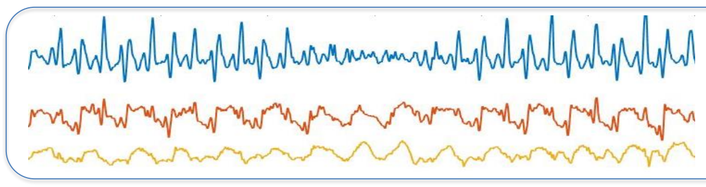
Parkinson's disease is the second most common neurodegerative disorders, affecting more than 10 million people worldwide. Objective and continuous monitoring of motor performance in daily living is of fundamental importance.

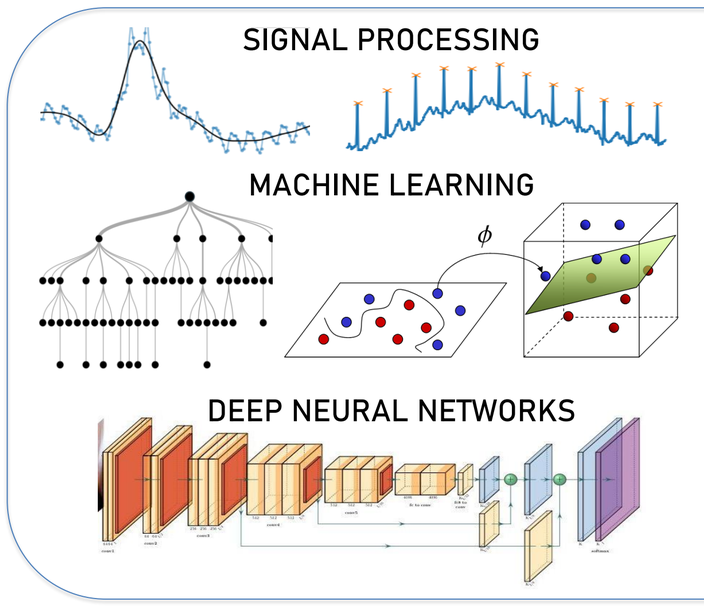
2.Objectives

Develop cheap, non-invasive, wearable, effective solutions for large-scale long-term monitoring of movement disorders in real-life scenarios.

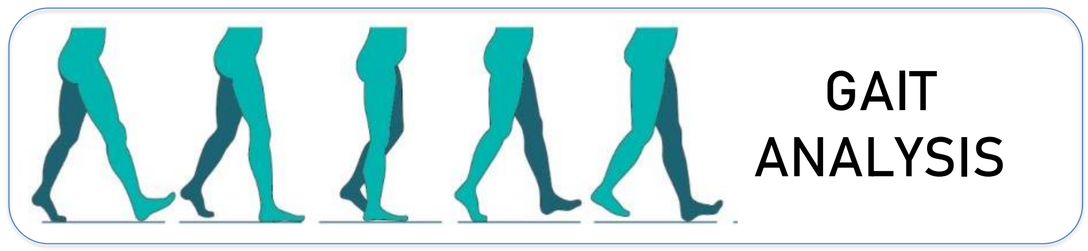
3.Methods

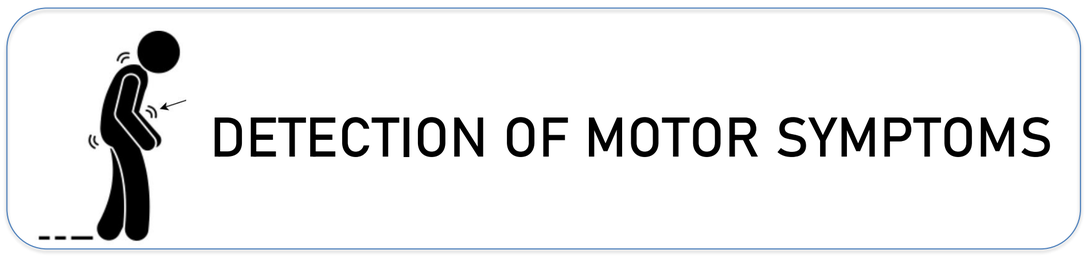






4.Results





5.Conclusions

The combination of wearable sensors and machine learning allows objective motion analysis. Results suggest that non-invasive wearable solutions can detect and analyze different activities of daily living, providing information regarding gait impairment, postural stability, and disease progression.

6.References

1. L. Borzì, L. Sigcha et al. Real-time detection of freezing of gait in Parkinson's disease using multi-head convolutional neural networks and a single inertial sensor. Artificial intelligence in medicine **2022.**
2. L. Borzì, I. Mazzetta et al. Predicting axial impairment in Parkinson's disease through a single inertial sensor. Sensors **2022.**
3. L. Borzì, G. Olmo et al. A new index to assess turning quality and postural stability in patients with Parkinson's disease. Biomedical signal processing and control **2020.**