From Single Algorithms to MobGap: The open-source validated Mobilise-D pipeline

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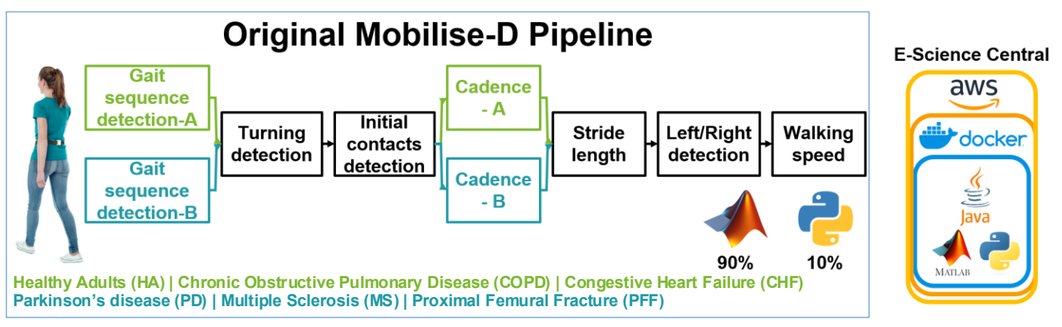
github\mobgap

FACTS & FIGURES

Start date:	01/04/2019
End date:	30/06/2024
IMI funding:	25 395 897 €
EFPIA in kind:	24 515 667 €
Other:	0 €
Total Cost:	49 911 564 €
Project website:	mobilise-d.eu
Social media:	LinkedIn, Twitter

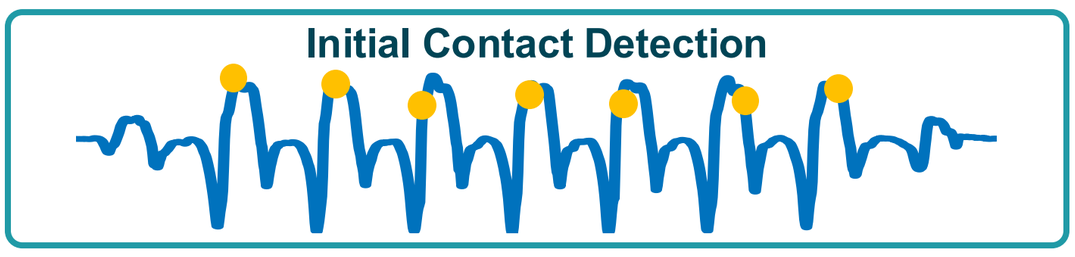
CHALLENGE

Mobilise-D developed and validated an analytical pipeline to derive **Digital Mobility Outcomes (DMOs)** from an inertial device. The original implementation relied on a mix of MATLAB and Python software, limiting accessibility and long-term sustainability. MobGap was developed to translate this work into an open-source Python toolbox for digital mobility assessment.



APPROACH & METHODOLOGY

I contributed to the development, implementation and validation of key components of the Mobilise-D analytical pipeline within **MobGap**:



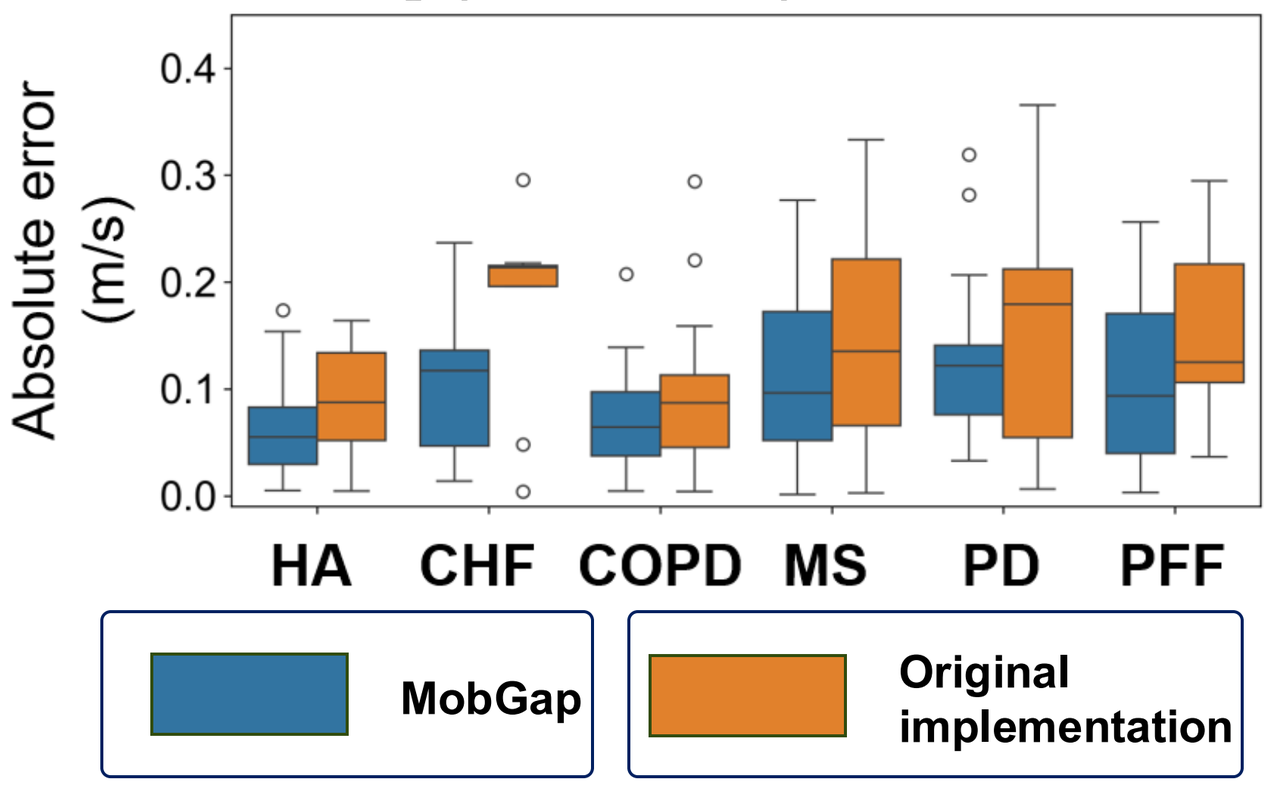
For each algorithmic block, the work involved understanding the underlying logic, translating it into Python, testing and validating the implementation, and producing documented usage examples.

RESULTS

From single algorithms to a validated open pipeline

MobGap successfully reproduced the Mobilise-D analytical pipeline within a fully open-source Python toolbox while maintaining performance comparable to, or better than, the original implementation.

Walking speed estimation performance*



* Free-living data of the Mobilise-D Technical Validation Study dataset (https://zenodo.org/records/15861907).

VALUE OF IMI COLLABORATION

A cross-disciplinary challenge

Mobilise-D brought together over 50 partners from academia, clinical centres, technology and pharmaceutical industry to translate wearable-sensor measures into clinically valid DMOs.

For my work, this environment provided access to:

Large-scale multi-centre data spanning six cohorts; the project included subjects with PD, MS, COPD, CHF and PFF, acquired across several sites.

Expertise across disciplines, connecting biomechanics, software engineering, clinical research, and digital health.

Common validation standards, enabling algorithms developed by different institutions to become components of the same validated analytical pipeline.

A route from research algorithms to reusable infrastructure, where methodological contributions could be converted into documented, tested and public software.

CAREER IMPACT

From research to reproducible digital health

Working within a large public-private European consortium allowed me to develop skills such as **reproducible research** and **open-source software development; large-scale data management** and **validation; collaborative research;** and **translational thinking.**

Mobilise-D therefore shifted my perspective **from developing individual algorithms to building validated, reproducible and adoptable tools.**

This work has received support from the EU/EFPIA Innovative Medicines Initiative [2] Joint Undertaking (Mobilise-D grant no 820820).