



# Medical Software Development – Sensor Data Analysis

Detection of Jumping Jacks in  
Patients with Multiple Sclerosis

Adrian Altermatt, Sarah Meyer

# Scientific Question

- In patients with multiple sclerosis, motor function can be severely reduced. We would like to develop a mobile app that can detect, whether our patients are able to perform countermovement jumps, which can be used to detect early stages of multiple sclerosis.
- Geßner, A., Stölzer-Hutsch, H., Trentzsch, K., Schriefer, D., & Ziemssen, T. (2023). Countermovement Jumps Detect Subtle Motor Deficits in People with Multiple Sclerosis below the Clinical Threshold. *Biomedicines*, 11(3), 774.  
<https://doi.org/10.3390/biomedicines11030774>

# Sensors Used

- LSM6DSV Accelerometer
- Orientation Sensor
- LSM6DSV Gyroscope

# Results

- Before Rolling & Peak/Trough Detection, the data was not easy to read, many overlays & unclear peaks
- Rolling with Window 3 and Peak / Trough Detection (width=1, prominence = 0, height=10, threshold=0.7) helped improve readability
- With these settings, the 6 peaks of the countermovement jumps were detected and identified correctly
- Biggest success in identification was made by Accelerometer

