



UNIVERSITÄT ZU LÜBECK
INSTITUT FÜR MEDIZINISCHE INFORMATIK
NACHWUCHSGRUPPE MOVEGROUP

Announcement Master, Bachelor and Study Thesis

Modelling and Implementation of a FHIR Profile for the Encoding of Wearable Data

Description:

Wearable devices can be used for continuous and longitudinal assessment of physiological measurements to enable improved prediction of clinical trials. In addition, continuous monitoring can provide valuable data on the user's health status and increasing physical activity limitation [1].

HL7 Fast Healthcare Interoperability Resources (FHIR) supports data exchange between healthcare software systems. FHIR can also be a valuable tool for data exchange between wearable devices and other healthcare software systems. This also promotes the reuse of medical device data, e.g. for clinical research purposes [2].

This thesis can be designed with respect to the following topics:

- Modelling of a FHIR profile for the encoding of wearable data, which includes information such as the placement, context, configuration, etc. of the wearable
- Implementation based on multiple sensor modalities (such as smartwatch, sensor belt, smartphone, smart glasses) that can be integrated into everyday life to ensure reliable measurement depending on environmental context and body site positioning
- Coding of clinically relevant outcomes for integration into HIS/decision support systems.

In case of a student research project or similar, a connecting thesis is possible.

This work is being carried out in cooperation with the Medical Data Engineering working group of the Institute for Medical Informatics at the University of Lübeck (<https://www.imi.uni-luebeck.de/en/research/medical-data-engineering-lab.html>).

Keywords: Data processing system, wearables, HL7 FHIR, IEEE 11073, decision support, monitoring.

Start: Immediately or by arrangement.

[1] Jessilyn Dunn, Lukasz Kidzinski, et al., Wearable sensors enable personalized predictions of clinical laboratory measurements, 2021 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8293303/>)

[2] Kathrin Pia Riech, Hannes Ulrich, et al., Abbildung medizinischer Gerätedaten von ISO/IEEE 11073-10207 nach HL7 FHIR, 2021 (<https://www.egms.de/static/en/journals/mibe/2021-17/mibe000222.shtml>)

If you are interested and have any questions about this topic, please feel free to **book an appointment** via: <https://calendly.com/fudickar/>



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Medical Informatics Initiative Junior Research Group

Integration and Analysis of Multimodal Sensor Signals and Clinical Data for Diagnostics and
Investigation of Neurological Movement Disorders (MoveGroup)

Further thesis topics at: move.ulü.de