海外の遠隔医療福祉の事例紹介

東海大学健康学部
健康マネジメント学科
柴田健雄

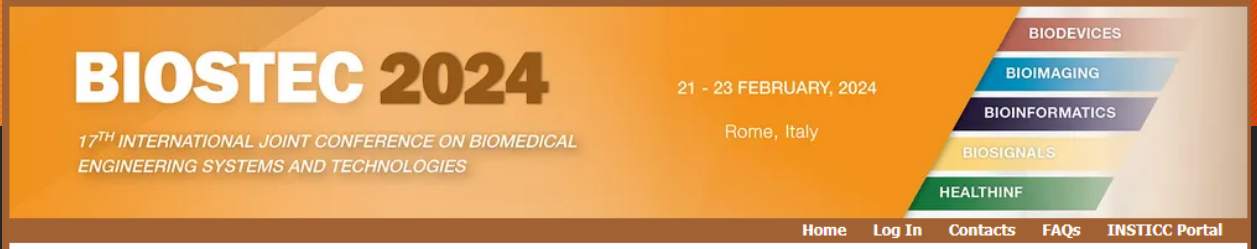
ヨーロッパでの関連学会

- **BIOSTEC** (International joint conference on Biomedical Engineering Systems and Technologies)

  Biodevices, Bioimaging, Bioinformatics, Biosignals, Healthinfoの5つの分野の合同国際会議
  毎年2月に南ヨーロッパで開催される。工学分野の参加者が多い。

- **MIE** (Medical Informatics in Europe)
  ヨーロッパ医療情報学会：医学的内容が多い

- **EUPHE** (European Public Health Conference)
  ヨーロッパ公衆衛生学会：WHOがジュネーブにあり、ヘルスプロモーションを中心に行政・政策から医師まで幅広く参加



Actions
On-line Registration
Registration Fees
Deadlines and Policies
Submit Paper
Guidelines
Preparing your Presentation
Templates
Glossary
Author's Login
Reviewer's Login
Ethics of Review

Information
Conference Details
Important Dates
Event Chairs
Keynote Lectures
Best Paper Awards
Satellite Events
Workshops
Special Sessions
Tutorials
Demos
Panels
Doctoral Consortium
Partners
Academic Partners
Industrial Partners
Institutional Partners
Media Partners
Partner Events
Publication Partners
Previous Conferences
Events
Abstracts
Invited Speakers
Awards
Books Published

Sponsored by:

INSTICC

INSTICC is Member of:

MEMBER

BIOSTEC 2024 will be held in conjunction with MODELSWARD 2024.
Registration to BIOSTEC allows free access to the MODELSWARD conference (as a non-speaker).

The purpose of BIOSTEC is to bring together researchers and practitioners, including engineers, biologists, health professionals and informatics/computer scientists, interested in both theoretical advances and applications of information systems, artificial intelligence, signal processing, electronics and other engineering tools in knowledge areas related to biology and medicine. BIOSTEC is composed of five co-located conferences, each specialized in a different knowledge area.

Announcements

Although the conference is back to the normal mode (i.e., in-person) speakers are allowed to present remotely if unable to travel to the venue (hybrid support).

The best student paper award will receive a special prize in the form of its registration reimbursement. We gratefully acknowledge ACM for sponsoring this prize.

BIODEVICES
17th International Conference on Biomedical Electronics and Devices

Program Chair
Maria Pedro Guarino, Polytechnic of Leiria, Portugal

BIOIMAGING
11th International Conference on Bioimaging

Program Chair
Kazuhiro Hotta, Meijo University, Japan

BIOINFORMATICS
15th International Conference on Bioinformatics Models, Methods and Algorithms

Program Chair
Malik Yousef, Zefat Academic College, Israel

BIOSIGNALS
17th International Conference on Bio-inspired Systems and Signal Processing

Program Co-chairs
Hui Liu, University of Bremen, Germany
Giovanni Saggio, University of Tor Vergata, Rome, Italy

HEALTHINF
17th International Conference on Health Informatics

Program Chair
Hannes Schlieter, Technische Universität Dresden, Germany

BIOSTECがバイオセンサーの開発から、データ解析まで幅広く、Tele-MedicineやTele-Careへの応用の情報源として面白い。

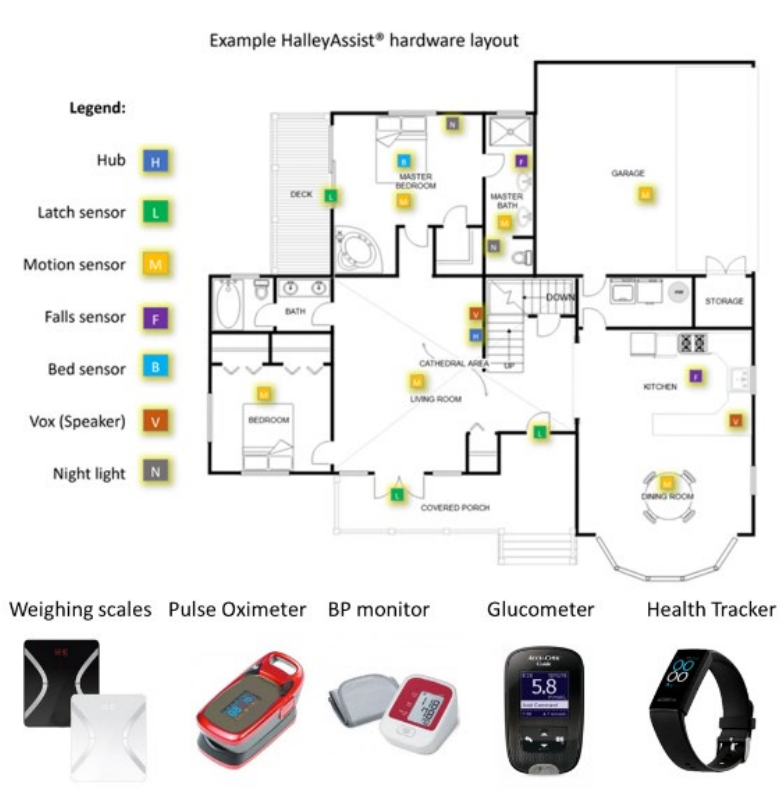
今回は近年BIOSTECで発表された関連事例を中心にいくつか紹介する。

HalleyAssist（Australia）

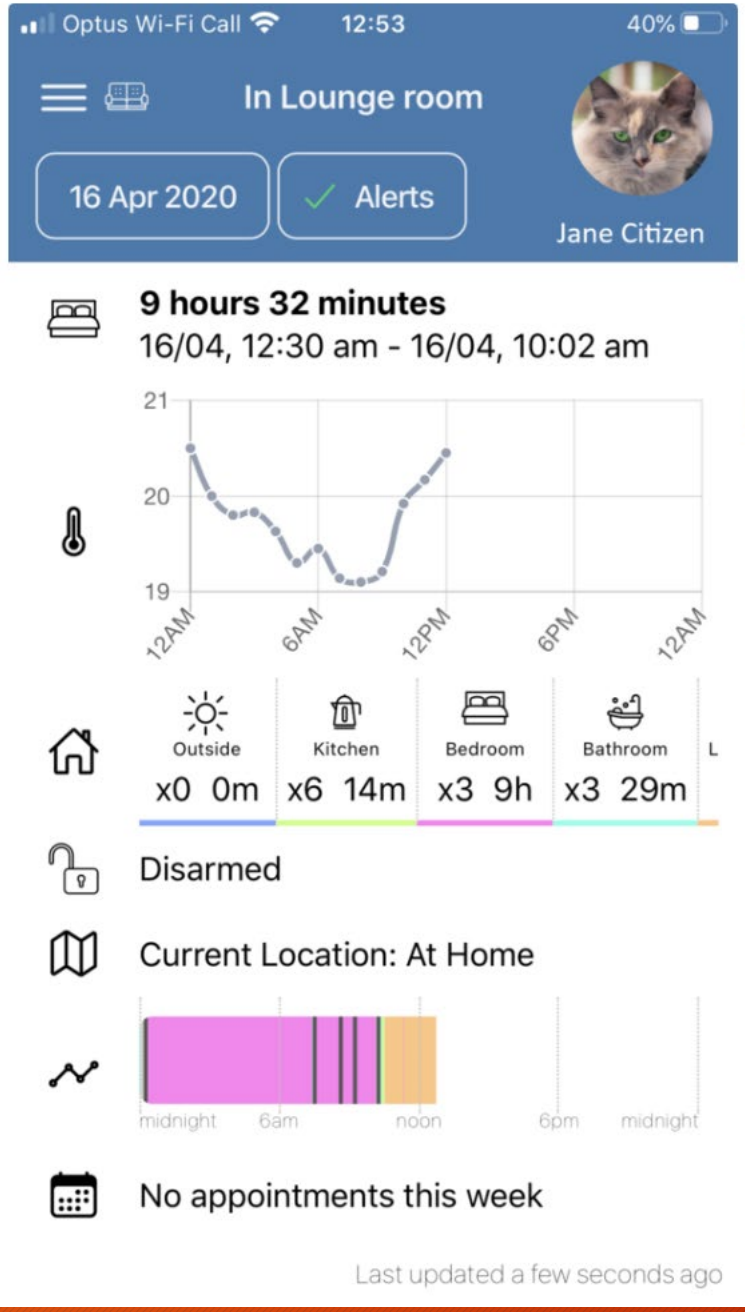
- Health monitoringのIoTプラットフォーム

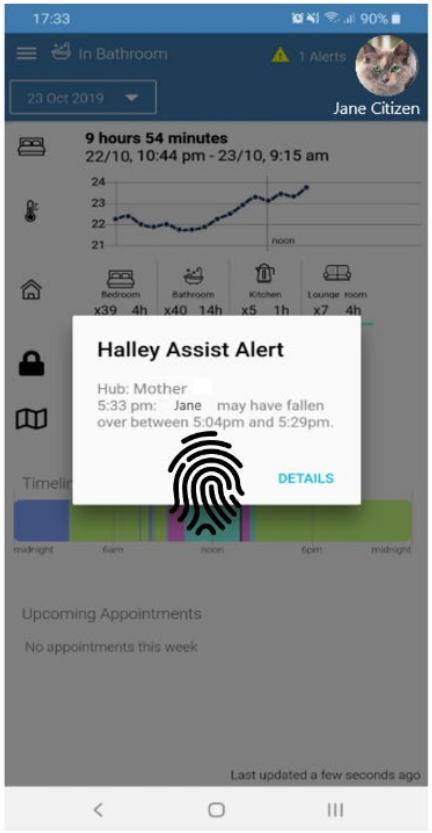
halleyassist.com

THE HALLEYASSIST® SYSTEM IS INSTALLED WITHIN YOUR HOME OR RESIDENTIAL FACILITY

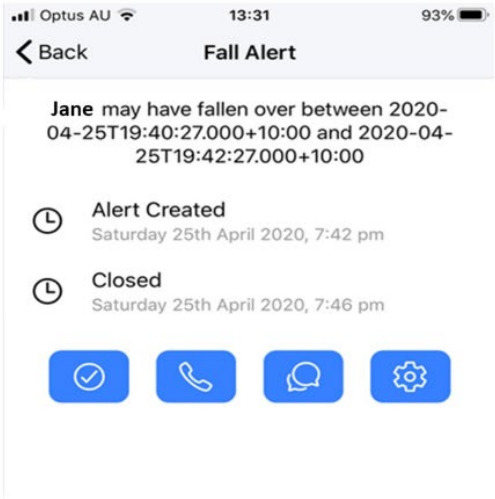


- Designed to be interoperable with clinical data management systems
- Supports healthcare delivery in the home
- In home patient monitoring in real time:
  - movement
  - sleep
  - falls monitoring without wearables
- Combined with approved medical devices to measure:
  - weight
  - blood pressure
  - pulse oximetry
  - glucose
  - activity tracking





Press for additional information



Federated Health Recommender System（Belgium）

- 複数の医療データを連結して、AIアルゴリズムにより最適な健康・医療行動を推奨することを目的としている。
  Federated Health Recommender System

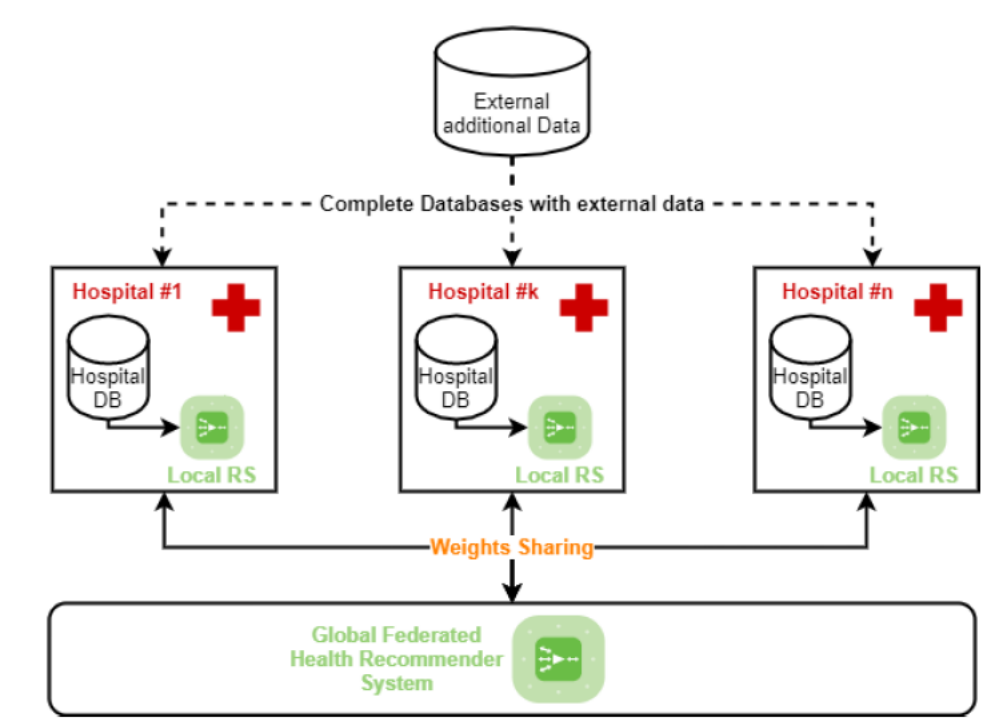


Figure 1: F-HRS Architecture.

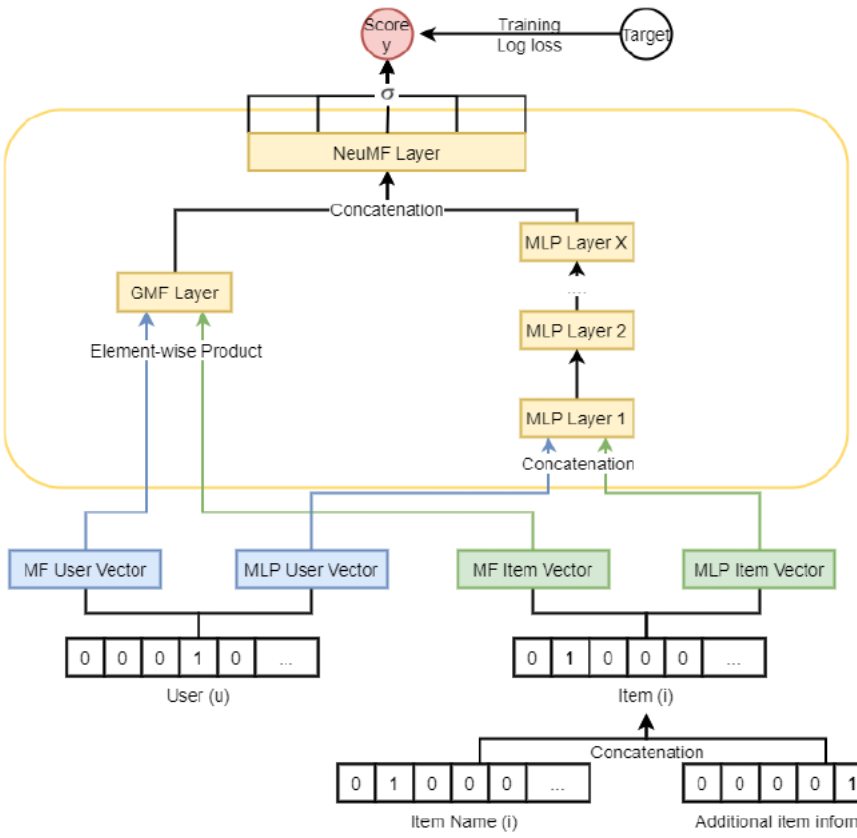


Figure 2: Neural Collaborative Filtering Architecture.

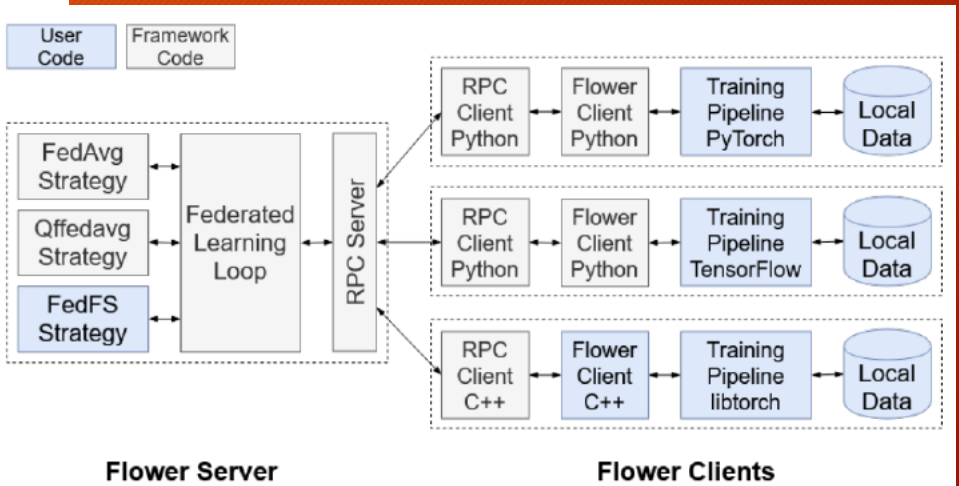


Figure 3: Flower core framework architecture.

フィルターを調節して、ウェイトを推定する。
最終的にはdrug-recommender systemに発展させることを目指している。

https://news.camozzi.com/new-products/milano-ventilatore-meccanico-mvm-certified-by-the-fda-and-available-for-production.kl

Milano Ventilatore Meccanico（Italy）

- COVID-19により在宅での医療機器モニタリングが必要になった。
- イタリアのMilano Ventilatore Meccanicoは人工呼吸器などの医療機器を在宅で使用する場合に遠隔監視できるようなデバイスを開発した。
- イタリアは病院の数を大幅に減らしてきており、COVID-19パンデミックの初期にあっという間に医療崩壊を起こした。とくに在宅ケアが重要な国である。

AIEHEM Project (Italy)

Artificial Intelligence Enabled Healthcare Ecosystem Model: AIEHEM Project

Luigi Lella[1], Ignazio Licata[1] and Christian Pristipino[2]
[1]*ISEM, Ins. For Scientific Methodology, PA, Italy*
[2]*Interventional and Emergency Cardiology Unit, San Filippo Neri –ASL Roma 1, Rome, Italy*

Keywords: Healthcare Management Systems, Data Mining and Data Analysis, Decision Support Systems.

Abstract: The AIEHEM project aims to analyze the data made available by the regional health system, using an unorganized Turing machine model (A-Type) trained with a swarm-evolutionary hybrid algorithm. The goal is to identify the main factors related to certain outcomes that the healthcare organization intends to achieve (which can be economic, organizational, social or environmental). The chosen AI model is used to enhance, not to replace the analytical capabilities of the healthcare system management. The insights of the AI model are in fact used not only to identify the main objects of study to be taken into consideration, but also to define the areas of intervention and consequently also the stakeholders to be involved in the organizational change project to be carried out through the Theory of Change methodology. AI is therefore used to identify the most suitable ecosystem for solving the considered problem.

Life Senior Profile（Brazil）

Figure 1: Front and back view of Empatica E4 device biosensor (McCarthy et al., 2016).

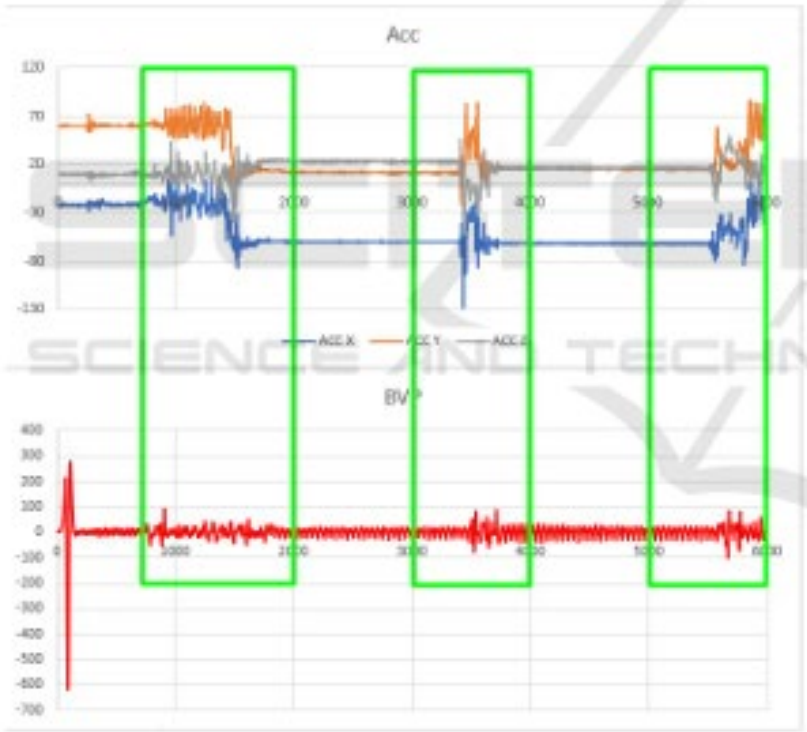


Figure 3: Accelerometer and PPG sensor signals.

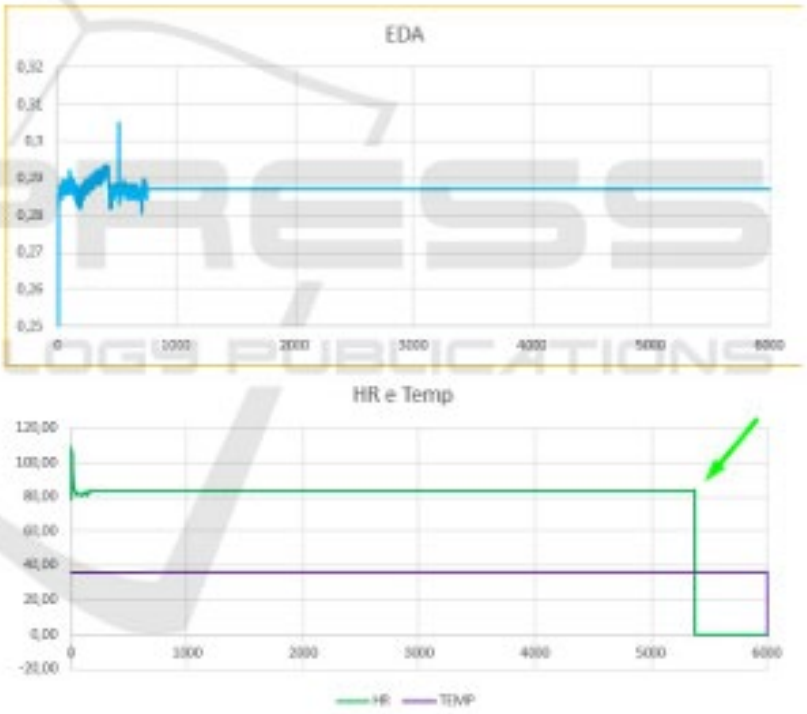
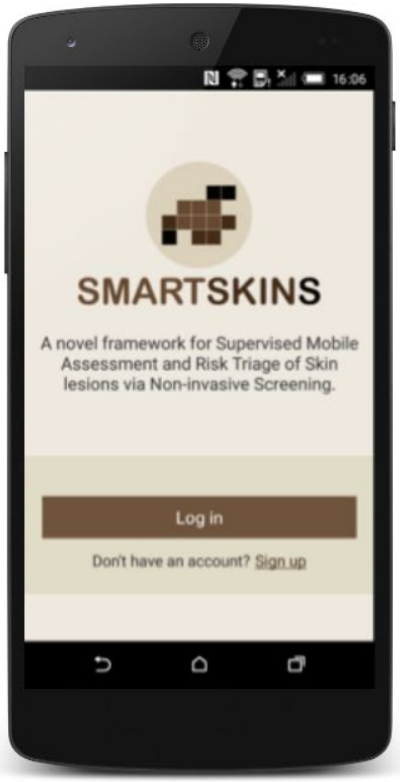


Figure 4: Signals from heart rate (PPG) and EDA and temperature sensors.

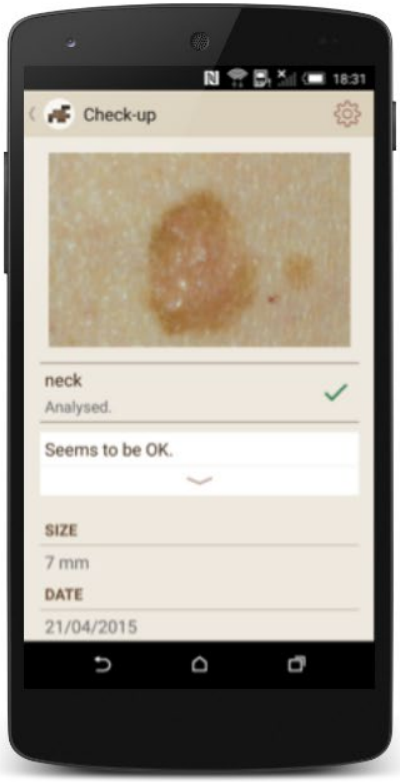
心拍以外に体表面温度なども測定でき、モニタリングできる

http://smartskins.projects.fraunhofer.pt/

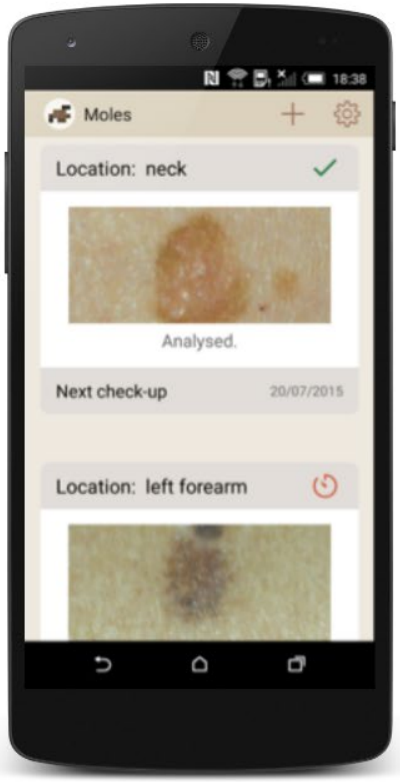
Smart Skins(Portugal)



Main menu for sign up or log in



Send skin mole images and receive feedback from dermatologists of the submitted check-ups



List all moles under regular monitoring and respective status.

皮膚科の遠隔診療をスマホ写真をベースに行うことができている

SeVA(USA)

- AI Solution for Age Friendly Care of Hospitalized Older Adults

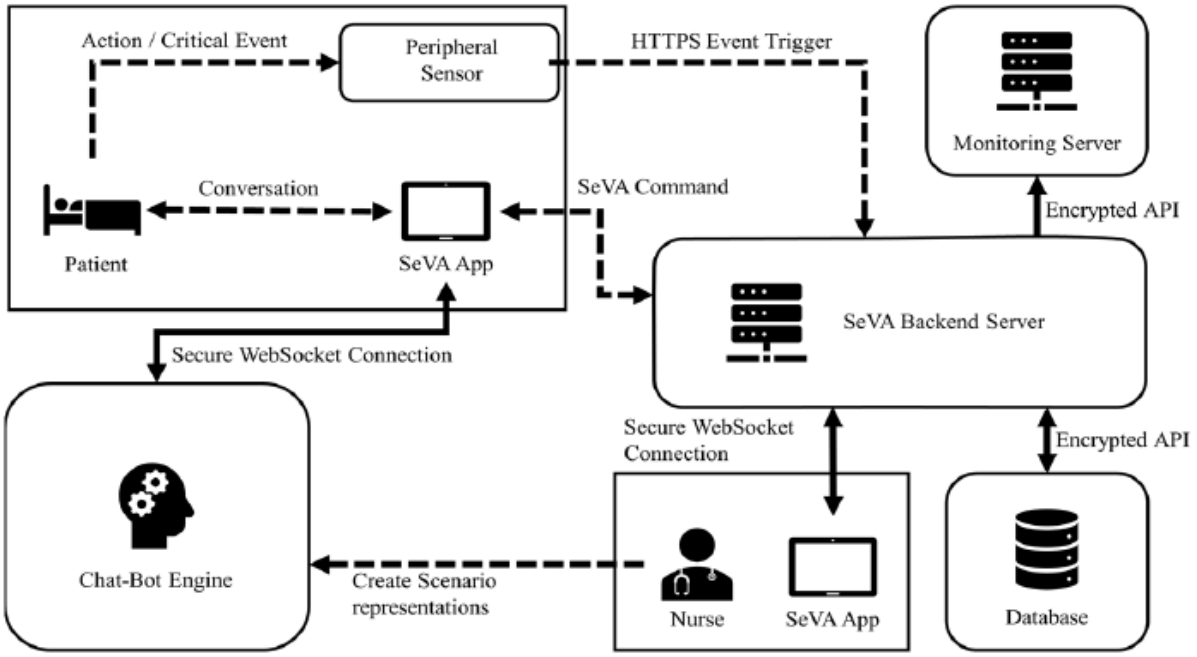


Figure 2: System Architecture of SeVA.

AIによるせん妄の自動判定、通知システム

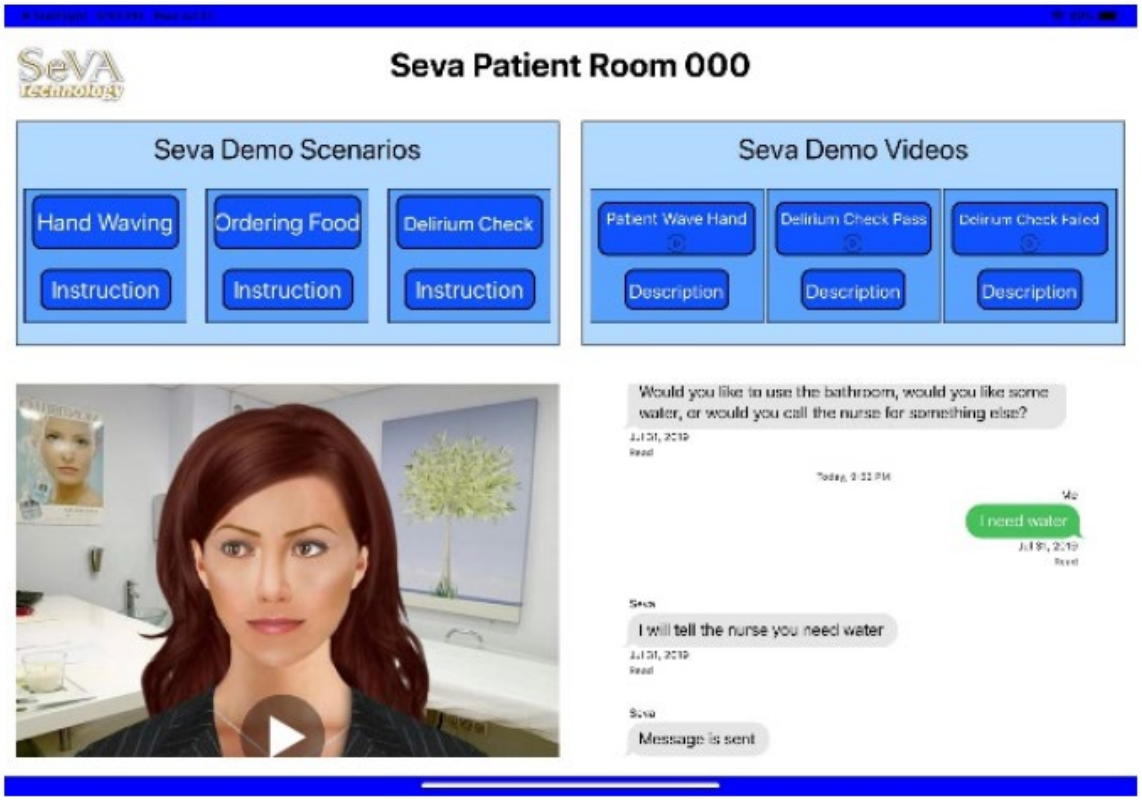


Figure 4: SPR application user interface.

iOS上で通知されるシステムを開発していて、iPadでモニタリングできる

Ambient Support System for Continence Management in Nursing Homes(Belgium)

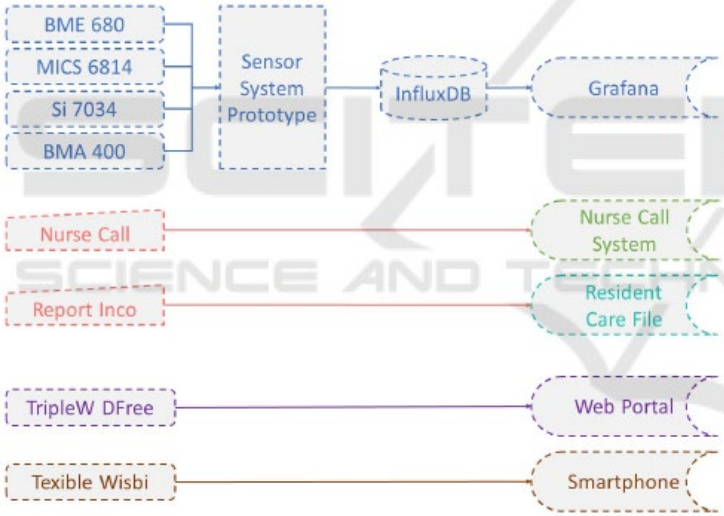


Figure 1: Implementation overview of the sensor system prototype, the manual data entry, and technically validated devices.

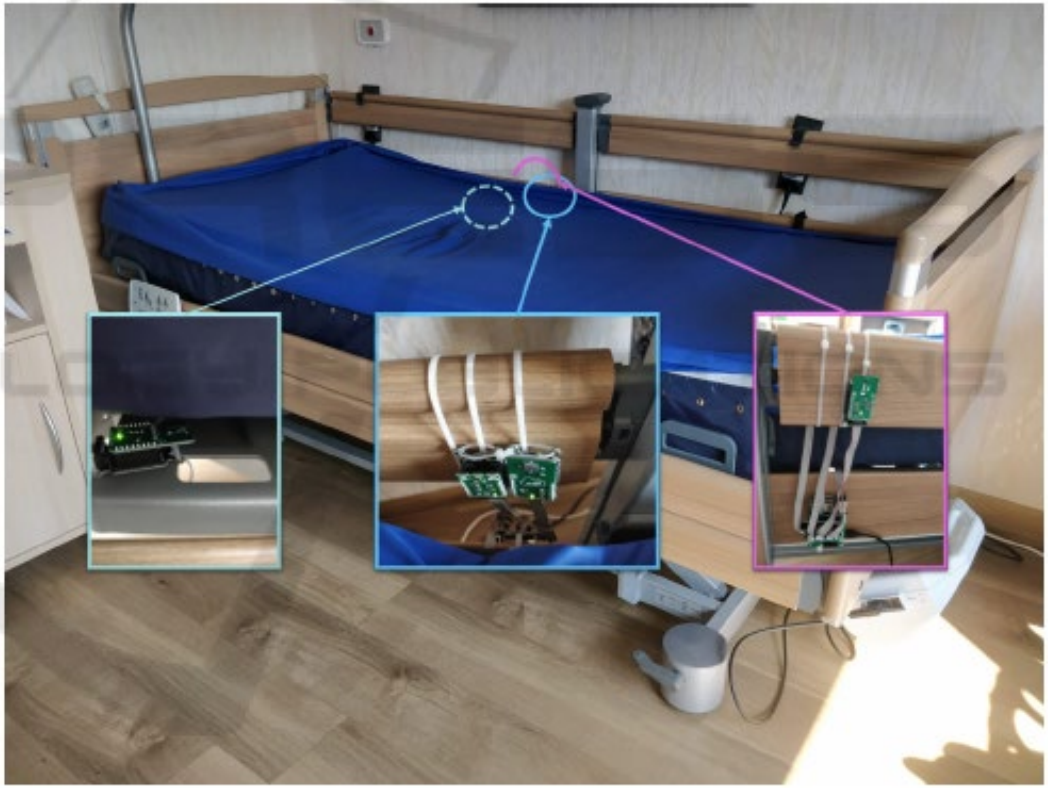


Figure 2: Picture of the sensor module at the care bed, including the Accel 5 click (left), the Weather click and Air quality click (middle) and Temp&Hum 2 click (right).

ウェブ（DFree）,スマホ（Wibisi）とモニタリングデバイスを拡張してきている

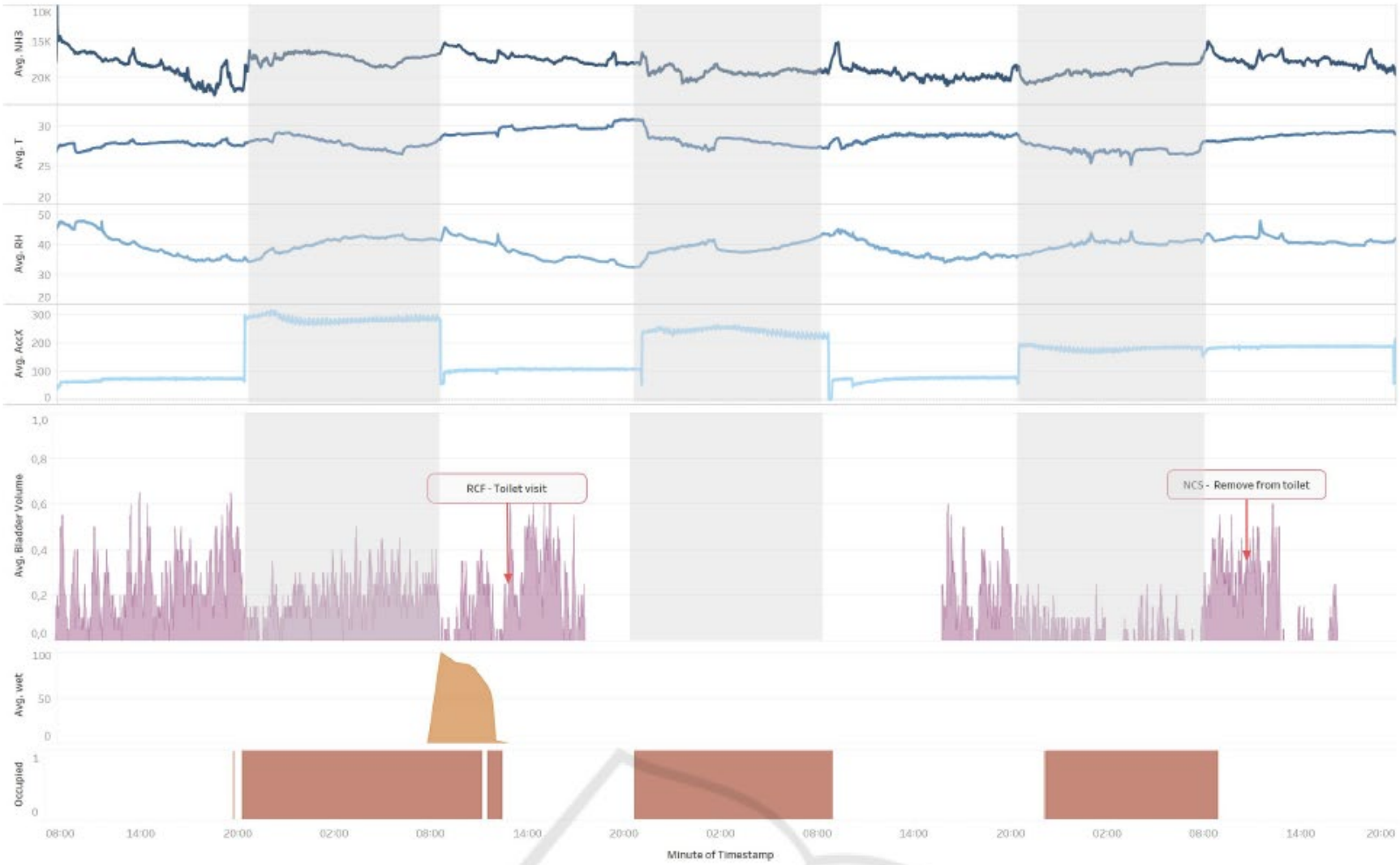


Figure 3: Time series plots of data from Resident 1: the sensor system prototype with the ammonia (NH3), temperature (T) and humidity (RH) sensor, and the x-axis of the accelerometer (AccX) (top), the DFree (middle), and the Wisbi wetness and occupation detector (bottom) over a period of 3.5 days.

ベッドまわりの環境や行動記録が遠隔（スマホ）でモニタリングできる