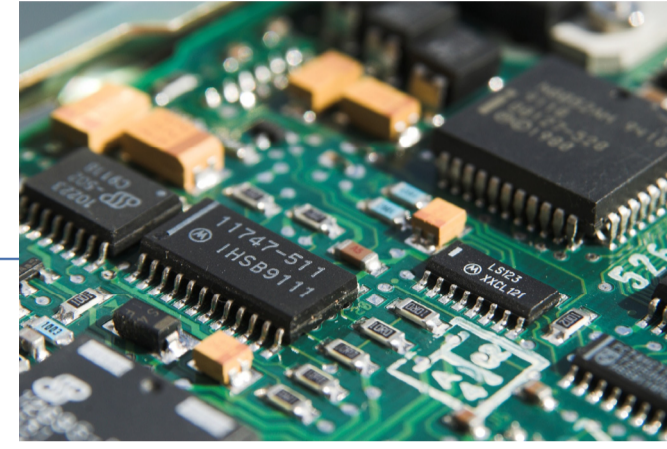


LICT in Health Tech

Data Collection



Devices:

- wearables
- wireless (reconfigurable) radar technology
- smart plate
- image sensors
- radiation hardened IC's
- μ -fluidics
- (indoor) localisation technology
- self-deployment, self-calibration

(Wireless) communications:

- secure and reliable data transfer
- sensor networks
- wearable antenna's
- wireless charging



Interaction



Direction:

- Human-to-Computer/system: steering, questioning, ...
- Computer/system-to-Human: information, feedback, persuasion, ...
- Human-building & human-robot interaction
- Citizen (patient) participation
- Technology supported training

Target:

- experts (clinicians, medical professionals), lay-people (patients & relatives)
- people with special needs (e.g. elderly, children) or disabilities
- policymakers
- developers

Technological concepts:

- new, natural/playful interaction paradigms, incl. (intelligent) chatbots & public space interaction
- persuasive system design
- personalized & interactive dashboards and recommender systems
- (serious) games
- smart & empathic spaces/buildings
- digital diagnostic tools

Technologies:

- interface technologies: touch, speech, 'free' text, gesture, haptic, tangible
- VR/AR/XR, 3D
- gamification
- (actionable) visualisation & recommender techniques

Analytics



Technologies:

- AI, Machine Learning, Deep Learning: supervised, unsupervised, semi-supervised, reinforcement or transfer based
- (biomedical) Signal Processing
- statistics, numerical approximation, time series analysis
- bio-informatics
- data-fusion, data-assimilation
- visual analytics

Applications:

- detection, tracking, classification, clustering, anomaly detection, trend analysis, ...
- simulation
- (big) data driven modeling & prediction
- digital twin
- decision support

Processing environment:

- Embedded/edge processing
- cloud & distributed processing

Types of data:

- wearables, sensors (incl. environmental), images/video, acoustic, radar, WiFi, mmwave, speech/text, ultrasound, thermal, lab-on-chip
- vital signs, breathing, activity, heart & brain signals, digital biomarkers, food intake, omics, ...
- complex data-sets: multimodal, multivariate, multi-origin, ...

Safety, Security, Privacy & Ethics



- dependable, secure and safe HW & SW; incl. EMC
- data related legal & ethical aspects; incl. responsibilities & reliabilities
- data privacy & security technologies
- secure access (incl. biometrics, authentication) and communications
- AI ethics (incl. explainability, transparency, fairness)
- blockchain

Some examples



- monitoring of activities (of daily life), physical activity, FOG, food intake, incontinence, sleep, epileptic seizures, neonatal, elderly, Parkinson patients, physical therapy, breathing, ... utilizing different types of technology
- (personalised) coaching/empowerment towards reduction of work-absenteeism due to mental health or musculoskeletal pain, increase of therapy adherence, healthy food selection, physical therapy assessment
- interfaces for people with disabilities: e.g. wheelchair based movement games interaction, assistive self-learning speech interface, signal processing for hearing aids, skweezes, ...
- therapeutic games: e.g. motion based games for people with motor disabilities, dyslexia screening, breastfeeding skill education, elderly activity enhancement, ...
- robotic furniture & adaptive architecture (light, acoustic, thermal,) for improving wellbeing at work
- medical text analysis

