DAAD-Programm „Deutsch-Arabische Transformationspartnerschaft“, Programmlinie 4: Deutsch-Arabische Forschungspartnerschaften

Projektprofil

Titel des Projekts:
Theralytics: Smart E-Health Services for Treating Patients in Tunisia

Name der deutschen Hochschule(n):
Universität Marburg

Projektverantwortliche(r):
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Partnerland/-länder:
Tunesien

Partnerhochschule(n)
Digital Research Center of Sfax

Kurzbeschreibung / Projektziele:
The Tunisian prime minister has initiated a strategic plan called “Digital Tunisia 2020”, which includes the design and development of electronic services that could be offered to Tunisian citizens, such as e-learning, e-business, e-culture and e-health. Since there is a lack of adequately equipped hospitals and medical professionals in rural regions in Tunisia, the proposed project is aimed at investigating, developing, deploying and evaluating an e-health software system for treating patients with chronic diseases like diabetes, cardiovascular disease, asthma and mental disorders. The software system a) collects data of a patient via a set of wearable sensors and smartphones, b) analyzes incoming sensor data together with data extracted from additional sources in the WWW, and c) automatically proposes an individual treatment plan. A medical expert validates the treatment plan and executes it on the patient living in a rural region. The research project is based on the use of: (i) wearable devices and smartphones for sensing data; (ii) low cost communication protocols, such as LoRaWAN, for transmitting health data (iii) Cloud computing for storing and processing data; (iv) data mining in the WWW to automatically extract useful health-related information; (v) semantic complex event processing for semantically modeling, analyzing and correlating data; and (vi) mobile devices (e.g., tablets, smartphones) to execute and validate the treatment plan. A LoRaWAN gateway has been built in the context of Theralytics. It is used to send health data to an analysis component that allows us to detect / predict health anomalies, such as heart strokes, epileptic seizures and depressive episodes. The analysis component is based on the use of machine learning techniques and complex event processing (CEP), and the CEP-based approaches make use of dynamic analysis rules.