Call for Papers!

Personal Health Systems for Chronic Diseases Monitoring

With the advent of new mobile technologies and new portable sensors, systems to monitor patients affected by chronic diseases have become a reality. With the aging of society and the surge of patients with chronic conditions the development of monitoring infrastructures has become a major goal for the developing and developed countries. Despite the importance of this goal, the first generation of personal health systems (PHSs) failed to reach a wide adoption, largely due to the excessive amount of information presented to patients and doctors and lack of interoperability with standard formats such as HL7. Second generation PHSs are now focusing on processing the data to provide medical doctors and patients with prefiltered, structured and interoperable information, in which the human computer interfaces (HCI) are user friendly and the handling of the co-morbidities is done by means of evidence-based medicine.

In addition, the advent of new mobile technology capable of performing cheap mobile computing, the health paradigm has begun to change considerably. Since the introduction of the first smart phones, the application market has seen a proliferation of applications to monitor health, connect to sensors, save data remotely and even produce reports on the health status of the individual, giving rise to the m-health paradigm.

However, m-health applications have so far mostly been separate from the healthcare system and the integration with e-health has also been difficult, mainly because of the interoperability challenge. Despite standardisation efforts such as those proposed by the Continua alliance, the data collected by such applications cannot be used by medical e-health systems deployed in hospitals, because the effort to translate such data to a format that would be understandable by such system is too big in terms of time and money. Despite this limitation, telemedicine systems are slowly being accepted by hospitals and medical doctors as systems that can relieve the burden of monitoring patients affected by chronic conditions.

Nowadays, several attempts have been made to create telemedicine systems to monitor chronic diseases and their most common comorbidities. This is becoming possible because most of the sensors are becoming compatible with Bluetooth technology and can be connected to smart phones. Nevertheless, they remain poorly accepted by the patients, who find the idea of wearing multiple sensors all at once uncomfortable. A more acceptable solution has been to consider integrated sensors that monitor physiological values all at once.

Given the growing market of chronic illnesses, the need of data that is structured and easy to access is becoming a mandatory requirement. Furthermore, in addition to the ability to monitor the chronic illnesses, there is also a need to interpret the physiological signals. Even assuming a situation where the doctor can in principle have access to all the data produced by sensors attached to the body of the patient, the amount and nature of this data makes it difficult to understand for medical doctors, limiting their interest in m-health systems.

In these settings, there is the need of m-health systems that can perform an intelligent filtering of the information, pointing out to the medical doctors areas of interest in the stream of physiological values associated to the patient, that may contain some interesting event associated to the illness of the patient. At the same time, the streams of physiological values contains, many times, partial information about what could happen in the future of the patient. In these terms, prognostic reasoning has been identified as an important area of research with respect to medical systems such as m-health ones. Additionally telemedicine and m-health are both becoming approaches that are pervasive and that can reach large number of patients and practitioners. This brings out the
necessity of using a pervasive computation approach, where the data of the patient is analysed by
the sensor of mobile smarthub on the spot, without the need of a centralised server that can perform
heavy computations.

This special Topical Collection of the Journal of Medical Systems invites contributions in the
following, but not only, aspects of Personal Health System Research:

- complex patients,
- chronic diseases monitoring,
- big data analysis,
- software engineering in m-health,
- machine learning in medicine,
- intelligent sensors,
- information compression,
- predictive models,
- interoperability,
- expert systems,
- causality in medicine,
- rule based monitoring,
- evidence based medicine,
- HCI in m-Health settings.

To submit, please go to http://www.editorialmanager.com/joms and choose the Article Type:

“Personal Health Systems for Chronic Diseases Monitoring”

All submissions will be reviewed according to the journal peer-review policy.

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