Fraunhofer Portugal AICOS
http://www.fraunhofer.pt

Bilateral Meetings

- Wednesday 10:40 h - 13:00 h
- Wednesday 14:00 h - 18:00 h

Description
The Fraunhofer Portugal Research Center for Assistive Information and Communication Solutions (Fraunhofer Portugal AICOS) aims to enhance people's living standards by offering them intuitive and useful technology solutions, capable of facilitating their access to Information and Communication Technologies. Fraunhofer Portugal AICOS focuses its activity in the areas of Ambient Assisted Living and ICT for development, working with companies interested in outsourcing/co-developing their applied research projects.
Organization Type
Research, Association/Agency
Areas of Activities

Medical devices

Information and Communication Technology

Imaging proceedings

Offer

Melanoma Detection App - Patient-oriented system of skin lesion analysis using a smartphone

Skin cancer corresponds to about one third of all cancers detected each year, affecting 1 in every 7 people throughout life. It is estimated that malignant melanoma accounts for only 8% of skin cancers detected, but is responsible for more than 70% of the skin cancer deaths. Early diagnosis of melanoma is extremely important since the success rates of curing skin cancer are very high if detected during the early stages of its development.

This mobile technology is a patient-oriented and self-monitoring system of skin lesion analysis using a smartphone which collects, processes and stores information of skin lesions through automatic classification. This classification is made by algorithms that measure and quantify features based on the ABCD rule which consists of 4 visual features highly relevant for skin cancer detection (asymmetry, border, color and differential structures).

The system is formed by 3 main blocks:

- Front-end Device (the patient's smartphone): used to take photos to skin moles and send them to a server;
- Server: used to process the image and store the analysis results;
- Back-end Device: the device that receives the analysis information collected by the server (smartphones, laptops, etc.).

Potential Market Applications:
- Mobile app for end user to track evolution of skin lesions and report data to HIS;
- Wide scale solution to screen skin lesions in primary care Health Centers.

Innovative aspects and main advantages:
- Simple solution based on a smartphone that allows to screen and track the evolution of skin lesions;
- Can be used in health centers as screening tool providing quantitative analysis of risk of skin lesion;
- Easy to integrate on HIS providing quality data to dermatologists that need to follow up the patients.

Keywords: skin   skin cancer   cancer   melanoma   mHealth   clinical decision support system

Cooperation Offered

1. License agreement
2. Research co-operation
3. Technical co-operation

Cooperation Requested

1. Investment/Financing
2. Technical co-operation
3. Distribution

Offer

EyeFundusScope - Mobile application to detect early stages of diabetic retinopathy

Diabetic retinopathy is a pathology consisting of a physiological deterioration caused by diabetes, one of the leading causes of blindness globally. It is estimated that 50% of diabetic patients for more than 10 years suffer from this pathology. Early detection is essential to avoid irreversible changes of the vision, but this is currently a difficult task due to the complete lack of symptoms as those only manifest themselves in advanced stages.

The EyeFundusScope app is a mobile solution that aims to identify early stages of diabetic retinopathy, characterized by being:
- accessible,
- mobile,
- low-cost,
- intuitive and easy to use.

With EyeFundusScope this detection is possible through an optical adapter connected to a Smartphone, which captures fundus (bottom of the eye) images. These images are processed and some disease indicators are automatically identified, allowing to estimate the patient risk to develop complications. This whole process, from the image acquisition to the detection, is integrated in an Android app.

Potential Market Application:
Large scale diabetic retinopathy screening with low cost devices.

Innovative Aspects:
Portable and easy to use - the EyeFundusScope allows performing an initial assessment by only using a smartphone and a small adapter to illuminate the retina.

Main advantages:
1 - Low Cost;
2 - Portable;
3 - Easy integration with HIS

Keywords: diabetes   diabetic retinopathy   blindness   mobile   mHealth   clinical decision support system
Cooperation Offered

1. Technical co-operation
2. Research co-operation
3. License agreement

Cooperation Requested

1. Distribution
2. Technical co-operation
3. Investment/Financing

Offer

Fall Activity Monitoring Framework

Falls are considered the main cause of fear and loss of independence among the elderly population. They are also a major source of morbidity, disability and health care utilization in older patients, representing 40% of all injury deaths.

To address this growing societal problem, Fraunhofer Portugal AICOS developed this technology framework which aims to:
- Detect elder fall events,
- Minimize elder fall occurrences and their impact,
- Monitor physical activity/inactivity

With 3 main complementary yet distinct components:
- Fall detection algorithms
- Fall risk assessment algorithms
- Fall prevention methods

The framework is tailored for integration on mobile, wearable platforms and related services, with a special focus on the needs and requirements of the elder population and its support structure (caregivers and institutions).

Several prototypes developed (substantial know-how accumulated) and tested whose accuracy and reliability were validated in live tests with end-users, such as:
- Smartphone-based automatic fall detection and emergency assistance notification system
- Application for continuous fall risk assessment
- Interactive games for physical activity and rehabilitation
- Application for physical activity tracking and encouragement

Main Innovation / Advantages:
- Patent pending method for enhanced fall detection and prevention with consideration of fall risk and activity profile
- Accuracy rate of over 97% for detection of falls based on inertial data only
- Flexible implementation (sensor selection and placement, input data and integration with related services)
- Widely tested

Keywords: falls fall detection fall prevention eHealth mHealth Elders ambient assisted living active ageing fall risk assessment

Cooperation Offered

1. Technical co-operation
2. Research co-operation
3. License agreement

Cooperation Requested

1. Distribution
2. Technical co-operation
3. Investment/Financing