Nuno Felício

New Bus. Devel. Coordinator
Fraunhofer Portugal AICOS
http://www.fraunhofer.pt

Bilateral Meetings

- Wednesday (10:00 - 12:30)

Description
Fraunhofer Portugal Research Center for Assistive Information and Communication Solutions (Fraunhofer AICOS), located in Porto, is the first research center operated by Fraunhofer Portugal. It 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, and therefore leading to the integration of an increasingly large part of the population in the Information and Knowledge Society. Fraunhofer AICOS focuses its activity in the areas of Ambient Assisted Living (AAL) and Information and Communication Technologies for Development (ICT4D), and fosters the creation of innovative solutions by cooperating closely with several companies interested in outsourcing and co-developing their applied research projects. By embracing a "living lab" concept, Fraunhofer AICOS is specialized in competences focused on the improvement of end-users experience, usability of applications and technological development. This expertise contributes to the market success of its client's products and services. Within these broadly defined Activity Areas, Fraunhofer AICOS has been giving priority to the following Research Areas: - Human-Computer Interaction - Information Processing - Autonomic Computing And the following Application Areas in terms of priority industry and business sectors: - Fall and Activity Monitoring - Chronic Disease and Well-Being Management - Assistive Environments - m-Government - m-Health - m-Agriculture - ICT for Very Small Enterprises.
Organization Type
University / R&D Institution,
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

Innovative Aspects and Main 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

Note: these are R&D results with TRL 5-7 (depending on the specific prototype or feature), available for licensing to companies, thus not a commercially available product for end-users.

Keywords: fall falls fall detection fall prevention fall risk fall risk assessment activity monitoring
Cooperation Offered

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

Cooperation Requested

1. Technical co-operation
2. Investment/Financing

Offer

Precise Indoor Location

Precise Indoor Location (PIL) is an indoor positioning system with submeter level accuracy that runs on your everyday Android smartphone and requires no beacons or other dedicated infrastructure to run.

Fraunhofer Portugal's indoor tracking solution merges information from inertial and environmental sensors, and combines knowledge from the human walking behaviour with magnetic and RF maps, as well as the building layout, if available, to provide a real time indoor coordinate.

After a one-time calibration procedure, any smartphone can then be used to locate the indoor position, resulting in a very accessible and low-cost way.

Note: these are R&D results with TRL 4-5 (depending on the specific application), available for licensing to companies, thus not a commercially available product for end-users.

Keywords: localization location indoor location indoor localization mobile indoor
Cooperation Offered

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

Cooperation Requested

1. Technical co-operation
2. Investment/Financing

Offer

EyeFundusScope - Smartphone Diabetic Retinopathy Analysis

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.

Innovative Aspects and Main Advantages:
1 - Low Cost;
2 - Portable;
3 - Easy integration with HIS

Note: these are R&D results with TRL 4-5, available for licensing to companies, thus not a commercially available product for end-users.

Keywords: retinopathy diabetic diabetes ehealth mhealth mobile
Cooperation Offered

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

Cooperation Requested

1. Technical co-operation
2. Investment/Financing

Offer

Melanoma Risk Assessment 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.

Note: these are R&D results with TRL 4-5, available for licencing to companies, thus not a commercially available product for end-users.

Keywords: ehealth dermatology telemedicine mhealth teledermatology mobile skin cancer melanoma

Cooperation Offered

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

Cooperation Requested

1. Technical co-operation
2. Investment/Financing