Clocking In at Work with a Selfie

Assiut University and UESystems Company

A group of researchers at Assiut University is developing in collaboration with UESystems Company a new attendance system. The Face In/Out project is about developing an accurate and convenient system for employees to clock in/out as easy as taking a selfie using their own mobile device. “The system relies on the state-of-the-art computer vision and machine learning algorithms for facial recognition and emotional expression analysis to ensure the true identity of the employee,” says Prof. Mou’men El-Melegy – professor at Assiut University. The mobile GPS tracking technology enforces employees only clocking in when they are actually at work. The system is contact-less and more hygienic compared to nowadays-popular fingerprint-based systems. Dr. Melegy also added: “It demolishes the need for building up queues of employees waiting to clock in/out”. The developed attendance system is perfectly suited to organizations with mobile workforce, such as painting or construction companies, to track employees who work remotely or switch jobs or locations regularly. The final fully functioning system prototype will include full software stack and comprehensive evaluation reports.

Attendance System by taking Selfie pictures

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A Microwave System for Weed and Plant Parasitic Nematodes Control

Egypt – Japan University for Science and Technology

Professors at EJUST are currently reviewing the idea of using microwave radiation at 2450 MHz to control weed plants and parasitic nematodes in soil, which has been considered recently worldwide due to the detrimental environmental effects of traditional chemical control methods. “This project addresses the design of a system that can produce microwave heating to destroy weed and nematodes cell structure in a short duration. Moreover, applying microwave heating properly can produce thermal runaway in weed plants leading to a reduction in the time needed for weed treatment,” says Dr. Adel Bedir – Professor at EJUST. Horn antennas focus the microwave energy, causing the heating and death of plant and nematode cells, offering a chemical free control system. Dr. Bedir added: “The proposed system can be integrated with a farm management system to irradiate the soil with microwave depending on the specific condition of the crop (growth stage) and environment (temperature, moisture, etc.)”.

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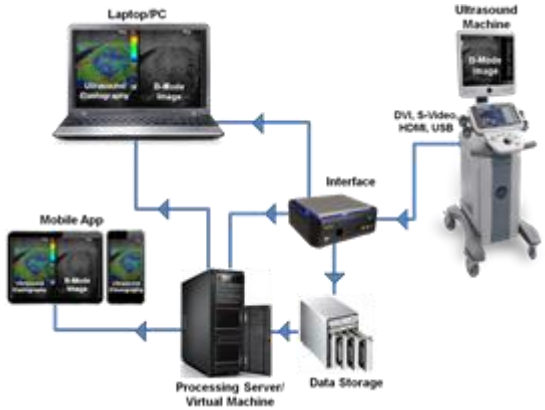
Proposed Microwave System for Soil Sanitation

Novel Elastography Solutions for Ultrasound Imaging Users

Cairo University & Dileny Technologies Company

Researchers from Cairo University are collaborating with Dileny engineers in developing elastograpgy solutions for ultrasound imaging devices. “This project develops a standardized, manufacturer-independent, cost effective, and clinically validated prototype strain elastography add-on module that can be used for the screening, detection, and visualization of several diseases such as breast tumors,” says Dr. Ahmed Ehab – associate professor at Cairo University. Ultrasound strain elastography, is an emerging technology that has been used to interrogate soft tissue stiffness while imaging noninvasively. Dr. Ehab added: “this novel module can be easily integrated with any ultrasound machine and combines several options including: 1- Reliable elastography algorithm validated using simulation, phantom, and clinical studies, 2- a user-friendly elastography software with advanced capabilities such as lesion selection, strain analyses, and interfacing protocols with ultrasound machines, 3- real time elastography option able to display ultrasound images side-by-side to elastography images during examination, and 4- a web-based ultrasound elastography option that enables users to access the elastography software anytime from anywhere”. Such module is not available on most conventional ultrasound machines in the market (>90%).



Add-on Module Elastography Ultrasound Imaging Device

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Portable Air Quality Monitoring and Purification

Ain Shams University

A Group of students at Ain Shams University won iCAN award in 2018. The winning paper proposes techniques to monitor and control air pollutants that are harmful to the human health and our planet. The main source of these pollutants comes from energy production and consumption that release Volatile Organic Compounds (VOCs) such as BTEX and Aldehydes group. Real time monitoring of these VOCs in factories, stations, homes and in the street is important for analysis of the pollution sources fingerprint and for alerting, when exceeding the harmful limits. Dr. Yasser Sabry – assistant professor at Ain Shams University says: “In this project we report the use of a MEMS FTIR spectrometer in the mid-infrared for this purpose. The spectrometer works in the wavelength range of 1.6 µm - 4.9 µm with a resolution down to 33 cm-1”.This wavelength covers the absorption spectrum of water vapor, BTEX, Aldehydes and CO2 around 2.65 µm, 3.27 µm, 3.6 µm and 4.3 µm, respectively. The minimum detectable concentration is in the range of 100 ppb. Besides, air purification using the ZnO nanowire technology is presented. Dr. Sabry concluded: “The achieved results open the door for a compact and low cost solution targeting air pollution monitoring and purification.”

iCAN Award 2018

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