ANSPRO TECHNOLOGIES

IEEE 2018-19 PROJECT LIST	
IMAGE PROCESSING	
CODE	TITLE AND ABSTRACT
19ANSP-IP-001	**Smart Monitoring Cameras Driven Intelligent Processing to Big Surveillance Video Data** ***Abstract***— Video surveillance system has become a critical part in the security and protection system of modem cities, since smart monitoring cameras equipped with intelligent video analytics techniques can monitor and pre-alarm abnormal behaviors or events. However, with the expansion of the surveillance network, massive surveillance video data poses huge challenges to the analytics, storage and retrieval in the Big Data era. This paper presents a novel intelligent processing and utilization solution to big surveillance video data based on the event detection and alarming messages from front-end smart cameras. The method includes three parts: the intelligent pre-alarming for abnormal events, smart storage for surveillance video and rapid retrieval for evidence videos, which fully explores the temporal-spatial association analysis with respect to the abnormal events in different monitoring sites. Experimental results reveal that our proposed approach can reliably pre-alarm security risk events, substantially reduce storage space of recorded video and significantly speed up the evidence video retrieval associated with specific suspects.
19ANSP-IP-002	**Development of Elements of Two-Level Biometric Protection Based on Face and Speech Recognition in the Video Stream** ***Abstract***— this paper presents the results obtained when creating a prototype of a software complex that implements speech recognition in the video stream by the motion of the lips with the help of a neural network. This speech recognition based on lip's motions is considered as a stage

	of two - level biometric authentication. The construction of a neural network model based on LSTM layers is also described here, which is basis of speech recognition's realization. To train this model we assembled and processed database containing recordings of words from a given set of classes. To process and extract the words from the video, the lip model was developed and optimized, described by the time variation of the geometric coordinates of the main points of the image of the lips. As result we achieved model that can recognize words from a given set of classes with an accuracy of 73.1%.
19ANSP-IP-003	**Implementation Features of Wounds Visual Comparison Subsystem** ***Abstract*—** Implementation features of wound image processing and its further storing by developed wounds visual comparison subsystem are considered. Corresponding algorithm, program source-code, storage table and obtained results are shown that make a practical value.
19ANSP-IP-004	**Fingerspelling – Indian Sign Language Training Tool** ***Abstract*—** In India, about 12.3 million people are hearing impaired (moderate or complete). Indian Sign Language (ISL) which is developed specifically for Indians is taught in over 850 schools where few teachers have the task of training large class. Primary challenge is to have parity in terms of teaching ISL to entire class. Additionally, it is difficult to identify their mistakes and provide personalized corrective feedback. Fingerspelling is a gesture-based animation app for teaching ISL. Fingerspelling consists of 'Learn' module: which demonstrates the ISL gestures; Practice module: which provides opportunity to the users to practice; and Test module: which checks the knowledge assimilation of the gestures. This app is built using free and open source tool: Blender. It has a desktop version and a web-based version. Our preliminary user tests reveal that the hearing impaired students find this app extremely useful and friendly to use. They were pleasantly surprised to interact with an app which can speak 'their' language.

	We propose to address the technical issues and modify the app to train the hearing impaired in a better and more efficient manner.
19ANSP-IP-005	**Embedded Foot Plantar Classification System Using Raspberry Pi** ***Abstract*—** Foot plantar classification is crucial to prevent dangers to patient's health that originated from an abnormal type of foot. When patients comprehend their type of foot, they will be able to form personal insole to prevent a hazard. On the contrary, some patients who ignore their risk will possibly have the problem. We design the system to classify type of foot by measuring foot pressure and foot curvature. For the software, we use webcams to capture the foot images that will be further processed by Raspberry Pi with OpenCV and color coding which correspond to foot pressure. For the hardware system, we use the component which is inexpensive and easily available. The hardware structure is composed of steel as a base where the transparent acrylic plate and glossy white paper is placed on. The black polypropylene sheet covering on the uppermost is used to block light from outside. Aligned on the side of the transparent acrylic plate LED strip is used for light source for the system. Underneath the steel base there are four webcams which is used to record feet images (two webcams for each foot). The images are sent to Raspberry Pi for image processing and displaying. The system is able to classify three types of the foot for patients including normal foot, high arch foot, and flat foot.
19ANSP-IP-006	**Research on Face Detection under Different Lighting** ***Abstract*—** Face detection is a biometric identification technology based on human facial feature information. This study uses the logitech C310 camera to collect images with faces and automatically detect faces in the images, and then carry out a series of technical processing on the detected faces. The traditional face detection technology is mainly based on visible images, which is also familiar with

	the detection method. But this kind of method has insurmountable defect, especially when the light environment changes, the detection effect will fall sharply, cannot meet the need of the actual system. The purpose of this study is to solve the classic problem of face detection under different lights, and to develop an intelligent and efficient human face detection method on Visual Studio 2015 platform software and OpenCV technology.
19ANSP-IP-007	**Raspberry Pi and Computers-Based Face Detection and Recognition System** ***Abstract***— This paper aims to deploy a network that consists a group of computers connected with a microcomputer with a camera. The system takes images of people, analyze, detect and recognize human faces using image processing algorithms. The system can serve as a security system in public places like Malls, Universities, and airports. It can detect and recognize a human face in different situations and scenarios. This system implements "Boosted Cascade of Simple Features algorithm" to detect human faces. "Local Binary Pattern algorithm" to recognize these faces. Raspberry Pi is the main component connected to a camera for image capturing. All needed programs were written in python. Tests and performance analysis were done to verify the efficiency of this system.
19ANSP-IP-008	**Facial emotion recognition in real-time and static images** ***Abstract***— Facial expressions are a form of nonverbal communication. Various studies have been done for the classification of these facial expressions. There is strong evidence for the universal facial expressions of eight emotions which include: neutral happy, sadness, anger, contempt, disgust, fear, and surprise. So, it is very important to detect these emotions on the face as it has wide applications in the field of Computer Vision and Artificial Intelligence. These fields are researching on the facial emotions to get the sentiments of the humans automatically. In Robotics, emotions classification can be used to enhance human-robot interactions since the robot is capable of interpreting a human reaction. In this paper, the

	emotion detection has been done in both real-time and static images. In this project, we have used the Cohn-Kanade Database (CK) and the ExtendedCohn-Kanade (CK+) database, which comprises many static images 640 x 400 pixels and for the real-time using the webcam. The target expression for each sequence in the datasets are fully FACS (Facial action coding system) coded and emotion labels have been revised and validated. So, for emotion recognition initially we need to detect the faces by using HAAR filter from OpenCV in the static images or in the real-time videos. Once the face is detected it can be cropped and processed for further detection of facial landmarks. Then using facial landmarks the datasets are trained using the machine learning algorithm (Support Vector Machine) and then classified according to the eight emotions. Using SVM we were getting the accuracy of around 93.7%. These facial landmarks can be modified for getting better accuracy.
19ANSP-IP-009	**System of Detection and Scanning Bar Codes from Raspberry Pi Web Camera** ***Abstract***— This work is focuses on the problem of detecting and scanning bar codes in video stream. The block diagram of a system identifying bar codes in panoramic images using Raspberry Pi 2 Model B was developed. The program algorithm of the system detection and scanning bar codes video stream for Raspberry Pi was proposed. It is established that systems can be used in industry, medicine, and in the control system.
19ANSP-IP-010	**Smart Detection and Reporting of Potholes via Image-Processing using Raspberry-Pi Microcontroller** ***Abstract***— One of the causes of local road accidents in developing countries, such as the Philippines, is due to road damages such as potholes. In addition, there is no proper road maintenance in the local roads, and so the checking of pothole is done manually. Hence, in this paper we propose a simple and robust design of a portable and affordable device that will be suitable for local jeepney (cab) drivers here in the Philippines. A distinguishing feature of this

	proposal is that it does not need a sophisticated Smartphone to automatically send the reports, and was tested in an actual moving vehicle. Furthermore, the system can be installed in a moving vehicle to automatically detect and report potholes via image-processing of Raspberry-Pimicrocontroller. Integration of several image- processing schemes has been used to produce an algorithm using Python Language from the OpenCV library that can detect and report potholes automatically from a moving vehicle. The reported image of the pothole and its location are stored and viewed through the use of the Internet, Dropbox, and web server. The system was tested on a Hyundai Eon city car with maximum speed of 10kph-40kph during daytime. With a rate of about 8 frames per second, images were processed per frame to detect potholes by analyzing its color, depth, and area. Overall, the whole system was successfully implemented using the Raspberry-Pi microcomputer and was able to detect and report potholes from a moving car with 100% reporting success rate.