# ICT R&D Newsletter in Egypt

AvidHealth On Detecting and Enforcing Compliance with Public Health Guidelines

AvidBeam

Teams from AvidBeam Technologies has taken on the task of integrating artificial intelligence and enhancing its effective role in the healthcare sector. After the Corona virus invaded the world in 2020, pharmaceutical companies and research laboratories rushed to find a drug or a vaccine to save billions of people around the globe. At the same time, information technology companies and those who are working in the field of artificial intelligence competed to find solutions that help these institutions and to impose their important role in the healthcare sector. Dr. Hani El Gebally — Founder of AvidBeam and project principal investigator stated that "AvidHealth was mainly developed to work on four main pillars: Crowd Detection, Vest & Helmet/Headcover Detection & Classification, Mask Detection or Improper Mask Wearing, and finally Monitor Physical Distancing. These pillars can be used combined or separately in several fields such as industrial, health, educational, oil & gas, and retail (including public stores and shopping malls).'

AvidHealth application that is deployed on ATUN platform can search, fire-warning alarms, identify violators of health guidelines, and analyze all these data. Authoritarian persons in such facilities can even extract reports to help them taking the proper and necessary measures in such cases. AvidHealth output accuracy was reported between 83% and reached 95%.
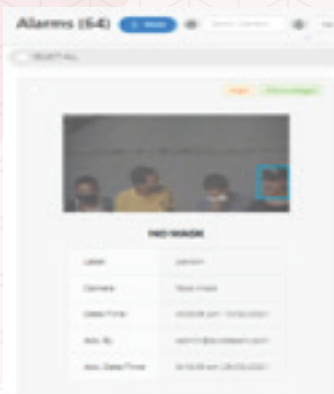
| No Mask Alarms | Improper Mask Alarms | Crowd Detection | Social Distancing |

KIDSTAR an augmented reality reading and behavior analytics application

APPTCOM software development

Teams from APPTCOM have developed KIDSTAR, which is an innovative reading platform for children to read interactive stories using augmented reality. Nowadays, children distracted by digital technologies which strongly attached them to their smart devices - leading to negatively impact children's social lives and their overall communication skills. Knowledge is a power, where reading could be primary sources for it and reading as habit becomes less of interest among children, which affected children's creativity and imagination.

KIDSTAR has allowed children to create their imaginary hero and use it within the platform to read and achieve new missions throughout stories. "The platform mixes the virtual and physical world to make it more intriguing to the reader. We also added an aspect of gamification to the reading to increase the motivation of children to complete the books. The more they read the more virtual missions are revealed and unlocked' Stated By Dr. Nevien Al Sayed —project principal investigator.

KIDSTAR also provides insights to parents on some aspects of the child's behavior through their interaction with the platform. For the safety and protection of children, KIDSTAR team made sure to create an application for parents that helps them in their responsibility to monitor the level of their children improvement in reading. We produce our first series of interactive stories and will be released in winter 2022.
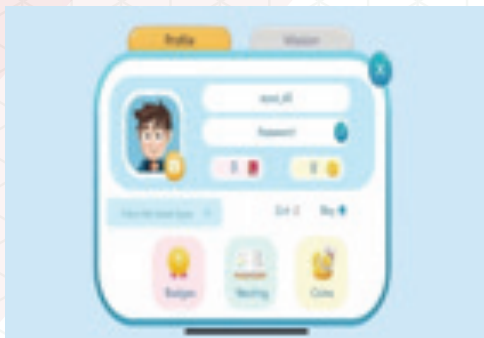
Smart Spout: A Water Quality System based on Big Data Analytics and Internet of Things in the Context of Smart City Initiatives in Egypt
Menoufia University

Researchers from Menoufia University design and developed a water quality monitoring and testing system using the Internet of Things and big data analytics as well as developed a small water quality unit that can be in entrance of drinking water source in houses as a part of smart home systems in a smart city. In recent times, Innovative technologies such as the Internet of Things (IoT) and Big Data Analytics (BDA) can lead to a revolution in the water management sector in Egypt. Accordingly, using this unit can help in indicating the level of water quality and send a notification message for houses owner and water stations in the city. Dr. Ayman El Sayed – Professor of Computer Science and Engineering department in Menoufia University and the project principal investigator Stated that "The benefits of the project can be through utilizing the power of big data analytics approaches for handling a massive amount of water for quality data better decision making regarding testing and monitoring of water sources such as Nile River in Egypt, also, design an IoT based water quality unit through the integration of smart water quality sensors, and cloud computing capabilities for storing and processing of enormous gathered water data.'

The deliverables of this proposed work are in the forms of:

▪ An intelligent system for water quality monitoring and testing based on the Internet of Things and Big Data Analytics.

▪ Small water quality units in the entrance of drinking water sources in houses.
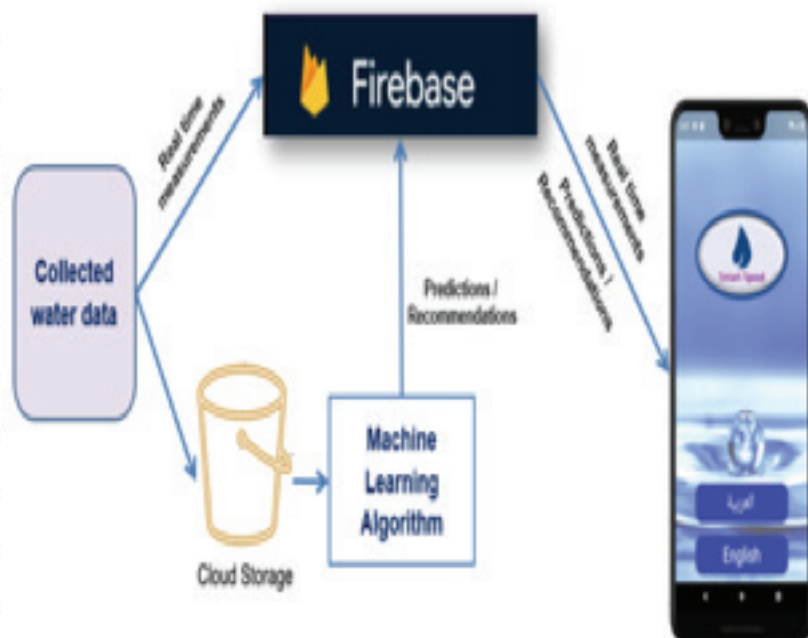
Low-Power Acquisition System for Continuous Wireless Blood Pressure Monitoring
Ain Shams University

Researchers from Ain Shams University created a proposal that targets the design challenges of a low-power acquisition system for continuous blood pressure monitoring that can be used within portable biomedical applications. "The recent focus on portable devices in biomedical applications and the rapid evolution of bio-chips has led to the need for designs operating at low supply voltages and consuming far less power than before. The persistent trend towards reduced supply voltage imposes many challenges on the performance of the designed circuits' Stated Dr. Sameh Ibrahim —Professor at Ain Shams University and the project principal investigator. A photoplethysmography (PPG) sensor is used to send a light signal that passes through human tissue and sense the received modulated BP wave that passes through the arteries. The change in the received light amplitude represents the corresponding change in the blood volume during the systole and diastole phases within the cardiac cycle. The blood volume variation is detected using PPG sensor in a current format that is amplified and translated into a voltage through a trans-impedance amplifier (TIA). The signal is then filtered and converted to the digital domain using a 12-bit analog-to-digital converter (ADC). Now, the data is ready and can be transferred/stored in the hospital's database for further processing or could be transmitted using a Bluetooth transmitter to a smartphone for convenient processing and displaying the measurement on the smartphone screen.