SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

28 February – 25 March 2020

TOPICAL REPORT

HEALTHCARE

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news

COVID-19 UPDATES

Microsoft's Healthcare Bot service helps power CDC's COVID-19 assessment bot

"Microsoft is continuing to step up its internal and external efforts to fight the COVID-19 coronavirus. Last week, Microsoft announced that the U.S. Centers for Disease Control and Prevention (CDC) is using Microsoft's Healthcare chat bot service to power its own COVID-19 assessment bot. The CDC's COVID-19 bot as meant to quickly assess symptoms and risk factors and suggest a next course of action (like see a doctor or just stay home)."

Source: ZDNet

DIGITAL HEALTHCARE

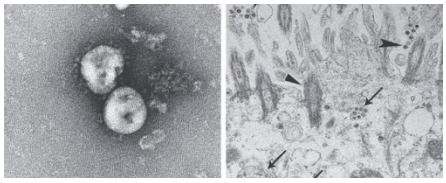
How Digitizing Healthcare Can Transform Patient Care

"Digital technology has affected many aspects of our lives, from banking to how we form relationships. I believe that digital technology has the potential to massively improve and transform patient care and outcomes. Here are some key learnings on how we can accomplish that"

Source: CNBC

academic

COVID-19 RESEARCH

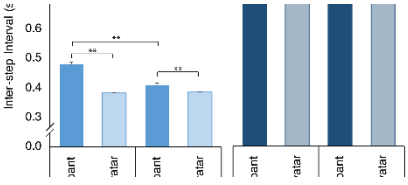


A Novel AI-enabled Framework to Diagnose Coronavirus COVID 19 using Smartphone Embedded Sensors: Design Study

"There are many mechanisms to detect the coronavirus disease COVID-19 including clinical analysis of chest CT scan images and blood test results. The confirmed COVID-19 patient manifests as fever, tiredness, and dry cough. Particularly, several techniques can be used to detect the initial results of the virus such as medical detection Kits. However, such devices are incurring huge cost and it takes time to install them and use. Therefore, in this paper, a new framework is proposed to detect coronavirus disease COVID-19 using onboard smartphone sensors. The proposal provides a low-cost solution, since most of the radiologists have already held smartphones for different daily-purposes."

Source: Human-Computer Interaction

DIGITAL HEALTHCARE



reports

HEALTHCARE REPORTS

Technological Advances in Digital Healthcare, Coronavirus Research, and Global Life Sciences Industries

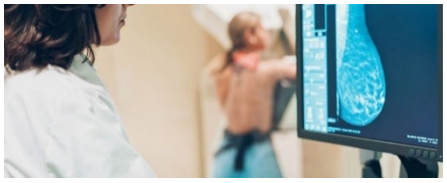
"This edition of the Life Science, Health & Wellness TechVision Opportunity Engine (TOE) encompasses innovation insights across digital drug discovery, cancer, synthetic biology, ischemic dieases, diabetes and microbiome therapies. The TOE also provides an analysis of latest advances in novel biologics, drug delivery, small molecules, and coronavirus research."

Source: Frost & Sullivan

Data is now vital in healthcare — but how's it being managed?

"At a time where different healthcare agencies across the world have to make sure that all actions are regulated, aligned and synchronized in efforts to contain the virus spread, data becomes just that much more instrumental. Having data that is accessible, of quality, and most importantly secure has helped agencies around the world receive updates, communicate information and pool intelligence to help with ongoing research."
Source: Techwire Asia

MACHINE LEARNING & AI IN HEALTHCARE



Chilmark Research: The Promise of AI & ML in Healthcare Report

"New Chilmark Research report reveals artificial intelligence and machine learning (AI/ML) technologies are capturing the imagination of investors and healthcare organizations—and are poised to expand healthcare frontiers."
Source: HIT Consultant

AI in healthcare – the global opportunity

"Just last month, scientists announced they had developed a new antibiotic, all thanks to data analysis driven by Artificial Intelligence (AI). An algorithm was used to analyse more than one hundred million chemical compounds in just a matter of days. The newly discovered antibiotic can destroy over 30 types of bacteria, and has been recognized in the medical community as a major step forwards in the fight against antibiotic drug resistance."
Source: Tech Radar

WEARABLES

Wearables & Big Data In Clinical Trials — Where Do We Stand?

"Wearable data presents many advantages due to the depth and breadth of information collected.

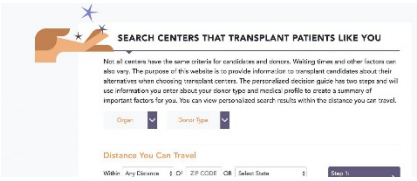
Timing and correction of stepping movements with a virtual reality avatar

"Virtual reality could help physiotherapy patients complete their exercises at home successfully thanks to researchers at WMG, University of Warwick, who managed to combine VR technology with 3D motion capture. Currently prescribed physiotherapy often requires patients to complete regular exercises at home. Outside of the clinic, patients rarely receive any guidance other than a leaflet of sketches or static photographs to instruct them how to complete their exercises. This leads to poor adherence, with patients becoming anxious about not getting the exercise right, or simply getting bored by the repetitiveness of the movements."
Source: PLOS ONE

FluSense: A Contactless Syndromic Surveillance Platform for Influenza-Like Illness in Hospital Waiting Areas

"We developed a contactless syndromic surveillance platform FluSense that aims to expand the current paradigm of influenza-like illness (ILI) surveillance by capturing crowd-level bio-clinical signals directly related to physical symptoms of ILI from hospital waiting areas in an unobtrusive and privacy-sensitive manner. FluSense consists of a novel edge-computing sensor system, models and data processing pipelines to track crowd behaviors and influenza-related indicators, such as coughs, and to predict daily ILI and laboratory-confirmed influenza caseloads."
Source: ACM Journals

MEDICAL DEVICES



Tool to Aid Patients in Selecting a Liver Transplant Center

"A new website developed by researchers at Hennepin Healthcare Research Institute (HHRI) and the University of Minnesota (UMN) is making it easier for organ transplant candidates to choose which transplant center is right for them."
Source: Liver Transplantation

Nanoparticle-based biomedical sensors

Theoretically, wearables can be used across therapeutic areas for deep phenotyping, detection and interpretation of adverse events, and clinical trial participant recruitment. Clinical trials depend on rich patient data. Collection in a physician's office captures a snapshot of the participant's data, i.e., one electrocardiogram or phenotype analysis. By contrast, wearables track consumer and patient data over large periods of time, resulting in rich data sets with the potential to reveal new insights."
Source: ClinicalLeader

Skin-Like Sensors Bring Human Touch to Wearables

"Scientists at the University of Toronto have gone one step further with this endeavor and developed a flexible, transparent, and self-powering sensor system that can be worn like a second skin to provide health monitoring."
Source: MDDI Online

New wearable tech can predict worsening heart failure

"A study led by the University of Utah Health in the US found that a new wearable sensor was able to predict worsening heart failure in the days leading up to hospitalisation. Researchers say this device could eventually help prevent up to one in three heart failure readmissions in the weeks following the patient's initial discharge from hospital."
Source: Irish Times

MEDICAL DEVICES

How bioelectronic medical devices are transforming modern healthcare

"Significant advances in bioengineering and neurology have led to the development of bioelectronic therapies, which in turn has presented new ways to treat chronic medical conditions. Bioelectronic medicine is the use of electronic devices to stimulate or dial down certain actions within the human body; instead of targeting the body's cells like most pharmaceutical treatments, the electrical impulses target a variety of nerve networks – creating a new level of medical precision."
Source: Pharmafield

MEDICAL EDUCATION

"Nanoparticles are playing a major role as the functional building blocks of a rapidly growing family of medical sensing devices. The very high surface-to-volume atom ratio of these zero-dimensional nanomaterials is particularly beneficial to detect very small concentration of medically important analytes and transduce their detection in electrical or optical signals."
Source: Frontiers of Nanoscience

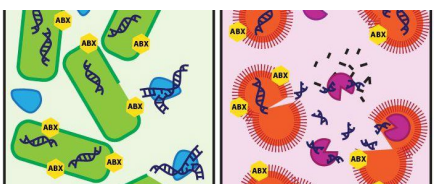
Wearing Your Heart on Your Wrist

"In this issue of JACC: Case Reports, Walsh and Lin (4) present the case of a 54-year-old woman with exertional intolerance and dyspnea presenting for evaluation of bradycardia after discovering a decrease in her heart rate as monitored on a Fitbit fitness tracker (Fitbit, San Francisco, California). This initial finding led to electrocardiographic (ECG) evidence of 2:1 atrioventricular block and prompted a battery of subsequent diagnostic tests, which ultimately led to the diagnosis and treatment of pulmonary and cardiac sarcoidosis."
Source: JACC: Case Reports

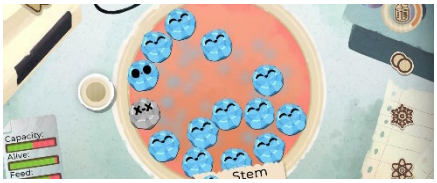
Soft, Implantable Bioelectronic Interfaces for Translational Research

"Herein, a translational framework engineered to accelerate the deployment of microfabricated interfaces for translational research is proposed and applied to the soft neurotechnology called electronic dura mater, e-dura. Anatomy, implant function, and surgical procedure guide the system design. A high-yield, silicone-on-silicon wafer process is developed to ensure reproducible characteristics of the electrodes. A biomimetic multimodal platform that replicates surgical insertion in an anatomy-based model applies physiological movement, emulates therapeutic use of the electrodes, and enables advanced validation and rapid optimization in vitro of the implants."
Source: Advanced Materials

HEALTHCARE RESEARCH



Surfactant-enhanced DNA accessibility to nuclease accelerates phenotypic β-lactam antibiotic susceptibility testing of Neisseria gonorrhoeae



'Lab in your phone' lets you play the scientific life

"A new phone game from the University of Cambridge puts players in the lab coat of a young stem cell research scientist as they navigate the tough route from undergraduate to the top tiers of modern science."
Source: Eurekalert!

"researchers from the lab of Rustem Ismagilov at the California Institute of Technology have developed two distinct, highly innovative AST methods for directly measuring a pathogen's susceptibility to beta-lactams (a class of antibiotics that includes penicillin) on extremely short time scales (about 30 minutes)."
Source: PLOS