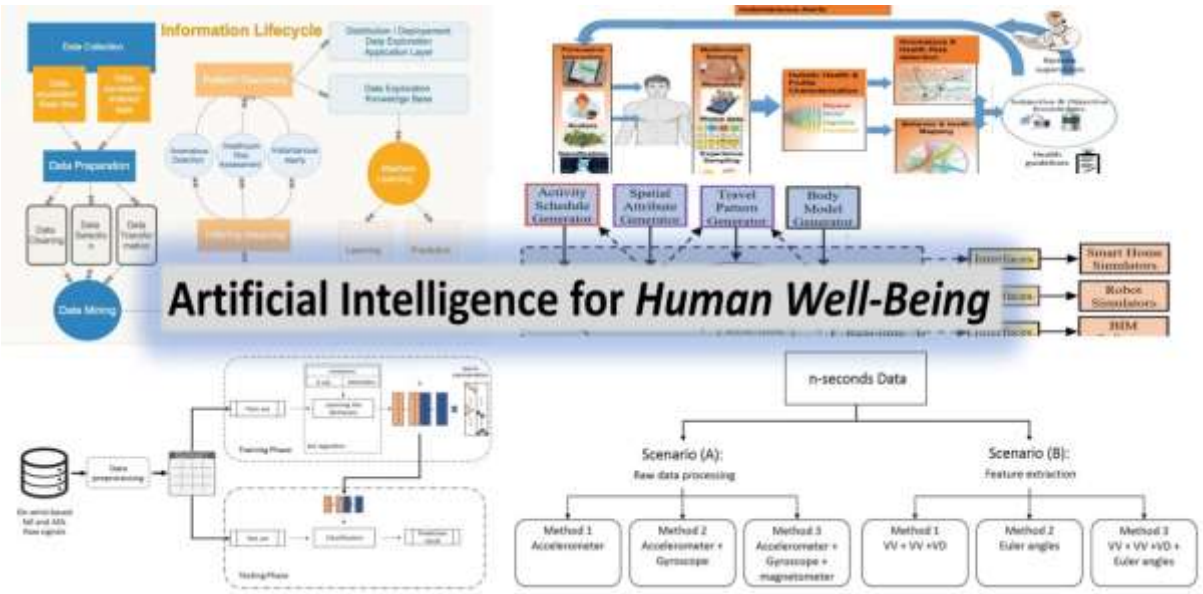
Created by Murat Durmus (CEO AISOMA)
LinkedIn: https://www.linkedin.com/in/ceosaisoma/

A Collection of Recommendable Papers & Articles on

AI for Human Well-Being



Content

Numerous AI initiatives are underway in the health sector. Some of these are aimed at promoting mental health and well-being. In the following, I would like to present some promising approaches/articles from this area.

Improving Access and Mental Health for Youth Through Virtual Models of Care

"The overall objective of this research is to evaluate the use of a mobile health smartphone application (app) to improve the mental health of youth between the ages of 14–25 years, with symptoms of anxiety/depression. This project includes 115 youth who are accessing outpatient mental health services at one of three hospitals and two community agencies. The youth and care providers are using eHealth technology to enhance care. The technology uses mobile questionnaires to help promote self-assessment and track changes to support the plan of care. The technology also allows secure virtual treatment visits that youth can participate in through mobile devices. This longitudinal study uses participatory action research with mixed methods. The majority of participants identified themselves as Caucasian (66.9%). Expectedly, the demographics revealed that Anxiety Disorders and Mood Disorders were highly prevalent within the sample (71.9% and 67.5% respectively). Findings from the qualitative summary established that both staff and youth found the software and platform beneficial."

Source: **Improving Access and Mental Health for Youth Through Virtual Models of Care**

Combining Human and Artificial Intelligence for Analyzing Health Data

"Artificial intelligence (AI) systems are increasingly capable of analyzing health data such as medical images (e.g., skin lesions) and test results (e.g., ECGs). However, because it can be difficult to determine when an AI-generated diagnosis should be trusted and acted upon—especially when it conflicts with a human-generated one—many AI systems are not utilized effectively, if at all. Similarly, advances in information technology have made it possible to quickly solicit multiple diagnoses from diverse groups of people throughout the world, but these technologies are underutilized because it is difficult to determine which of multiple diagnoses should be trusted and acted upon. Here, I propose a method of soliciting and combining

multiple diagnoses that will harness the collective intelligence of both human and artificial intelligence for analyzing health data. "

source: **Combining Human and Artificial Intelligence for Analyzing Health Data**

Design of a Framework for Wellness Determination and Subsequent Recommendation with Personal Informatics

"Due to the advances in medical science, increasing health consciousness, improved quality of food, the average human life span has increased to a great extent. On the other hand, stresses of modern life, overwork and less sleep, increased usage of digital devices and internet, less exercise, are leading us to poor quality of life. Elderly people are more vulnerable to reduced life quality due to deterioration of both physical and mental health. People at any age need to maintain a minimum level of wellbeing to pursue his or her daily activities to lead a fulfilling life. Thus the need of assessing and restoring wellness is very important. Fortunately the progress of information and communication technologies provide use sensor devices and computing platform to feel, monitor and restore the wellness."

source: **Design of a Framework for Wellness Determination and Subsequent Recommendation with Personal Informatics**

Combined Machine Learning and Semantic Modelling for Situation Awareness and Healthcare Decision Support

"The average of global life expectancy at birth was 72 years in 2016 , however, the global healthy life expectancy at birth was only 63.3 years in the same year, 2016. Living a long life is not any more as challenging as assuring active and associated life. We propose in this paper an IoT based holistic remote health monitoring system for chronically ill and elderly patients. It supports smart clinical decision help and prediction. The patient heterogeneous vital signs and contexts gathered from wore and surrounding sensors are semantically simplified and modeled via a validated ontology composed by FOAF (Friend of a Friend), SSN (Semantic Sensors

Network)/SOSA (Sensor, Observation, Sample and Actuator) and ICNP (International Classification Nursing Practices) ontologies. The reasoner engine is based on a scalable set of inference rules cohesively integrated with a ML (Machine Learning) algorithm to ensure predictive analytic and preventive personalized health services. Experimental results prove the efficiency of the proposed system."

source: **Combined Machine Learning and Semantic Modelling for Situation Awareness and Healthcare Decision Support**

Automatic Daily Activity Schedule Planning for Simulating Smart House with Elderly People Living Alone

"A simulation tool that supports developers to build scenarios automatically in multiple simulation platforms is proposed. As an essential part of this simulator, this study proposed an activity schedule generator to mimic the daily life of elderly people living alone. This generator outperforms existing methods of activity schedule planning in three aspects: 1) it is adaptive to the layout of a simulated smart house; 2) there is no unspecified time in the timeline of generated schedules; and 3) it generates stable, but not tedious schedules for a number of days. A real-time location data generator is proposed to convert generated schedules to simulated real-time location data of the resident, and a proposed interface converts these simulated location data to simulated records of virtual passive infrared (PIR) sensors,"

source: **Automatic Daily Activity Schedule Planning for Simulating Smart House with Elderly People Living Alone**

A Novel On-Wrist Fall Detection System Using Supervised Dictionary Learning Technique

"Wrist-based fall detection system provides a very comfortable and multi-modal healthcare solution, especially for elderly risking falls. However, the wrist location presents a very challenging and unstable spot to distinguish falls among other daily activities. In this paper, we propose a Supervised Dictionary Learning approach for wrist-based fall detection. Three Dictionary learning algorithms for classification are invoked in this study, namely SRC, FDDL, and LRSDL. To extract the best

descriptive representation of the signal data we followed different preprocessing scenarios based on accelerometer, gyroscope, and magnetometer. A considerable overall performance was obtained by the SRC algorithms reaching respectively 99.8%, 100%, and 96.6% of accuracy, sensitivity, and specificity using raw data provided by a triaxial accelerometer, according"

source: **A Novel On-Wrist Fall Detection System Using Supervised Dictionary Learning Technique**

Mindful Technologies Research and Developments in Science and Art

"This paper outlines three projects that lay the foundation for a trans-disciplinary approach to the creation of interactive, multi-sensory devices combining biofeedback, virtual reality, and physical/virtual human-machine interactions. We explore new possibilities for interoperability and enhancing interoception and mindfulness with potential research contributions for novel personal, professional and medical applications."

source: **Mindful Technologies Research and Developments in Science and Art**

Prioritizing Human Well-being in the Age of Artificial Intelligence (IEEE)

“The idea is that the changes that are brought forward by these digital technologies could be monitored across all the various dimensions of human well-being.”

Fabrice Murtin, Senior Economist , Household Statistics and progress Measurement Division of the OECD Statistics Directorate

“One of the first aims of the EU is the promotion of its values and the well-being of its people.”

Salla Saastamoinen – Director, Directorate A, Civil and Commercial Justice, Directorate -General (DG) for Panel One, from left to right: Salla Saastamoinen, Justice and Consumers (JUST), European Commission

“On the various recommendations raised you can ask questions about how to address the well-being of the user to come up with concrete solutions. This is the game changer for how we rethink development.”

Raja Chatila - Chair of The IEEE Global Initiative

“What companies are realizing is that well-being and human value are the central motivation for their innovation.”

Virginia Dignum - Associate Professor, Delft University of Technology

source: **IEEE**

Contact

Murat Durmus
CEO & Founder @ AISOMA AG
Frankfurt am Main, Hessen, Deutschland

https://www.linkedin.com/in/ceosaisoma/
murat.durmus@aisoma.de
https://www.aisoma.de