**AI enabled home-health monitoring system for Elder Care**

Supraja Rapuru

Masters in Data Science, Bellevue University

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Catherine Williams

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There is an unprecedented growth in the percentage of aging population throughout the world. In the USA, 14.5% of the population is 65 years or older, but by 2030 these number is anticipated to grow to 20% ((2020,November). Elderly people require quick diagnosis and continuous supervision by a professional caregiver, the fact that we are not training enough physicians and caregivers to account for the increased demands of healthcare. The US will face a shortage of between 40,800 and 104,900 physicians by 2030 (Mann,Sarah (2017, March)).

Artificial Intelligence may play novel role in filling the in-person monitoring gaps due to shortage of direct care workers. This can be achieved by artificial intelligence health monitoring technologies by monitoring, analyzing and alerting family and health care team and reducing the burden on family caregivers and improving the quality of care.

**Enablers:**

Smart watches and other wearable devices also those are built into smartphones, already collecting physical activity ( heart rate, sleep cycle, breathing rate, activity level, blood pressure etc), dietary information to provide a snapshot of an older adult’s general lifestyle. AI powered health monitoring technologies build upon these capabilities can recognize, learn, reason, adapt, predict and decide whether alert care providers and family members for emergency care.

AI home-health monitoring system continuously detect changes in activity and behavior patterns for early detection of health issues.

IoT Sensors that are installed in various locations in a person’s home and can track things like physical activity, motion, sound, vitals, or other environmental situations

AI monitoring programs that continually analyze input data may be able to detect anomalies which may not caught by human eye such as an older person is taking gradually longer time to gain balance while trying to stand up or regaining balance. Upon predicting health decline based on the collected data, the automated analytic system can then decide to alert care providers for safe care based on previously set risk threshold or even behavioral suggestions to the older person.

**Barriers:**

Older adults are not always aware of the extent of the monitoring, which can lead to feelings of shame and humiliation.

Care providers may use algorithmic suggestions to reinforce their own recommendations for action.

Lack of human connections, social engagement may lead to depressions, increased risk of dementia and poor quality of life.

Insurance companies who access the data may use them against the patients, e.g. by terminating the coverage or increasing the cost of insurance premiums.

**Recommendation:**

Given the aging population and need to improve care processes and care for the elderly, technology offers great promise however I would completely subscribe to that barriers must be addressed for these tools to be available to this growing population. Design, education, research, and policy all play roles in addressing these barriers to acceptance and use.

I would certainly recommend proceeding on coming up with an application by ensuring the project is guided with the framework of ethical values by introducing the use of four actionable principles: (i) fairness, (ii) accountability, (iii) sustainability and (iv) transparency (Leslie, David, (June, 2019)). Fairness refers to the avoidance of bias and discrimination, for example, and according to it, the AI system should use only fair and equitable data. Accountability refers instead to the auditability of the system, ensuring that responsibility of all actions is established throughout the AI system, from the design to the final implementation. Sustainability of the system refers to the safety, reliability, accuracy and robustness of the system. Finally, transparency covers the ability of the designers to always explain how the system is working and how it will affect its users.

**References**

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