

## **Abstract**

One of the driving forces for the digitalization of the healthcare environment is Artificial Intelligence (AI). AI is the principle and development of computer systems capable of performing tasks that typically involve human intelligence. AI has facilitated healthcare innovations from drug development and selection to screening clinical trial patients. AI has proved to be effortless, reliable, and accurate in various disease diagnostics especially in medical imaging, neurology, cardiology, diabetes movement disorder and mental health, yet ethical challenges and validation frameworks remain questionable.

With its infinite power, AI has the potential to revolutionize patient healthcare creating a paradigm shift in disease diagnostics. The availability and increase of healthcare data, plus the increase in 21st century computer power, has facilitated the adoption of AI in healthcare diagnostics and fuelled the rapid results and analytic techniques. Addressing the diagnostic performance of AI within a hospital setting across different disease areas, through to the acceptance and reliance of AI and its diagnostic capabilities in digital wearable technology (for example, Apple Watch, Fitbit and other smart devices), AI is allowing patients to track and monitor their own health conditions and disease progression. These wearables can remind patients to take medication, signalling reminders. Some patients, especially those with heart conditions such as Atrial Fibrillation, receive warning alerts through their device which could have lifesaving consequences.

Against this background, this thesis delves into the literature on AI in healthcare diagnostics and penetrates the minds of the patient to gain enriched insights and knowledge across two definitive target groups: Non wearable candidates, and wearable candidates. Through a qualitative research approach using snowball sampling techniques and thematic analysis, this thesis illuminates the patient perspective of AI in diagnostic healthcare within two different mindsets. The aims are to identify what are the frequent applications of AI in the diagnostic healthcare sector, what do patients think of AI in healthcare diagnostics, what factors are driving patients to adopt digital diagnostic wearables to monitor their own health and what are the hindering concerns causing avoidance. The impacts, concerns, and successes of AI in healthcare diagnostics, are identified, showing areas where AI has, in many cases from a diagnostic perspective, outperformed doctors. This thesis will be theoretically underpinned by both the Technology Acceptance Model and the Healthcare Belief Model. One major aim is to bridge the gap in the lack of literature and the scarcity of empirical findings regarding the patient perspective of AI uses in healthcare diagnostics. Additionally, this thesis will lay the foundations for future expansion and investigation around this exciting topic.

Using qualitative research in the form of face-to-face interviews via video links and a snowball sampling approach, 17 sets of patients' opinions regarding the uses of diagnostic wearable devices and the diagnostic capabilities of AI in healthcare have been analysed. The interviews involved candidates who are currently wearing a diagnostic wearable device such as an Apple Watch or Fitbit

against non-wearable candidates. The findings were cross examined between the groups and the perceptions of these candidates were thematically analysed. Conclusions have been drawn which demonstrate differences in the understanding of AI from a diagnostic healthcare perspective both in a clinical setting from first diagnosis using AI instead of a doctor through to monitoring and detecting medical conditions in the form of wearable devices.