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ITAI 2372 - Artificial Intelligence Applications

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October 22nd, 2024

Analysis of '2057 - The Body' and AI's Role in Modern Healthcare

Introduction

Released in 2007, the Discovery Channel documentary "2057”, “The Body", envisions the future of technology in 2057, showcasing technologies that seemed like science fiction at the time. The documentary explores concepts such as smart sensors monitoring our health and brain chips restoring movement to paralyzed patients. This report compares these predictions with current advancements in artificial intelligence (AI) in healthcare as of 2024, highlighting how these futuristic ideas are becoming realities.

Documentary’s Predictions vs. Current Technology

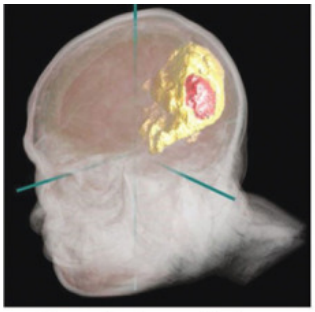
The documentary presented sensors monitoring the body through smart shirts worn by athletes and soldiers to maintain health and enable quick responses to wounds. Nowadays, medical sensors can track glucose levels and other vital signs, providing real-time health data to users and doctors. An AI assistant was also represented, where a device helps maintain optimal dental care. In reality, smart toothbrushes now use AI to analyze brushing habits, providing feedback through smartphone apps to improve oral health.

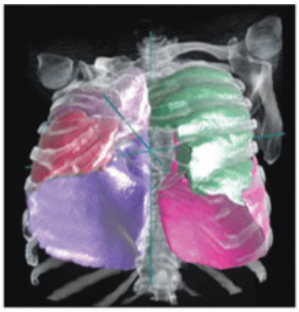
A brain chip to make people walk again envisioned restoring motion to paralyzed patients. Today, brain-computer interfaces (BCIs) have enabled individuals with paralysis to control prosthetic limbs or even regain some movement. In recent breakthroughs, neural implants have helped patients walk by bypassing damaged spinal cords. “BCI research has focused on biomedical applications, such as helping people disabled by a stroke, physical injury, or neurological disorder” (U.S. Government Accountability Office).

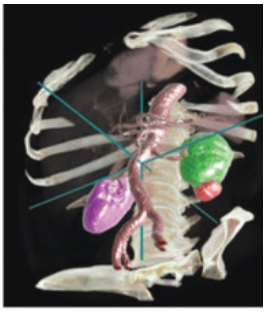
Analysis of AI’s Current Impact on Healthcare

AI is transforming healthcare through enhanced diagnostics, personalized treatments, and efficient data management. “Studies have demonstrated AI's ability to meet or exceed the performance of human experts in image-based diagnoses from several medical specialties” (Bajwa, Junaid, et al.). Machine learning algorithms analyze medical images to detect diseases like cancer earlier and more accurately than ever before. AI aids in personalized medicine by

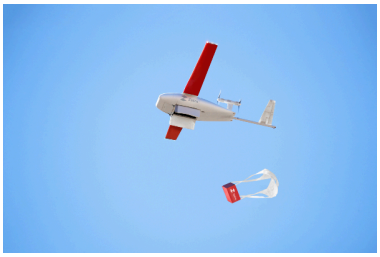
tailoring treatments based on individual genetic profiles, improving effectiveness, and reducing side effects.


Quantitative radiology


Radiation oncology


Surgical planning

While flying cars for medical evacuation remains largely in the realm of imagination, drones are being used to deliver medical supplies. Innovations in air ambulances and vertical take-off vehicles are also progressing, aiming to improve emergency response times. “Memorial Hermann Health System will be the first health care provider in Houston to deploy Zipline’s instant home delivery service, making autonomous drone deliveries of specialty prescriptions and medical supplies directly to patients’ homes beginning in 2026" (Memorial Hermann).



Robotic surgery was another futuristic concept. Now, robotic surgical systems like the “Da Vinci” robots by Intuitive Surgical are widely used, allowing surgeons to perform complex procedures with enhanced precision and minimal invasiveness. AI further improves these systems by providing real-time data and assistance during operations. “Digital insights are translated into action to help improve care and efficiency; these insights are culled from the largest set of robotic-assisted surgery data in existence” (Intuitive Surgical).

Ethical and Social Implications

Despite the benefits, ethical concerns arise. Protecting patient privacy is critical when AI systems handle sensitive health data. There's a risk of algorithmic bias, where AI trained on non-diverse data may yield unequal outcomes, affecting certain populations unfairly. “While it holds significant potential, the technology requires massive amounts of patient data, raising concerns about privacy, security, and other ethical issues” (HITRUST Alliance).

Accessibility is another concern. Ensuring these AI innovations are accessible and affordable is essential to prevent exacerbating existing inequalities. Moreover, the human touch in medicine remains vital. While AI can handle data analysis and routine tasks, the empathy and ethical judgment provided by human caregivers are irreplaceable. Balancing technological advancement with compassionate care is crucial.

Conclusion

The technological representations made in "2057 - The Body" are progressively materializing, with AI at the forefront of these advancements. Technologies like mind-controlled prosthetics and AI-enhanced diagnostics are no longer mere science fiction but are becoming part of modern medical practice. Therefore, it is essential to ensure these innovations benefit all members of society by continuing to address the ethical and social challenges when integrating AI into healthcare.

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