



Artificial intelligence for surgeons – a walkthrough from 1955 to the future

William Flannery

Royal Berkshire Foundation NHS Trust, UK

Abstract:

Artificial intelligence (AI) was first coined by computer scientist John McCarthy in 1955. There is no accepted definition of AI but we could start with ‘machines that perform tasks that require intelligence when performed by humans’.

The formal birth of Artificial Intelligence (AI) was in 1956 at the Dartmouth conference. AI has had several boom/bust cycles however in the 1990s, AI started to gain traction exemplified by IBM’s chess program Deep Blue beating Gary Kasparov. Millennial AI has been aided by increasing computing power web usage (search, eCommerce, sharing economy, regulated industries etc.). AI is now fully-embedded in many areas of our lives.

What are the mechanics of Artificial Intelligence? It is difficult to explain AI without resorting to code and algebra. This presentation gives an overview of the mechanisms of AI for the lay person focusing on the 3 main types of machine learning.

Healthcare is a difficult area for AI to crack. This is partly because it is highly-regulated and because computers are not good at natural language – human communication which has developed over time through use and repetition. In 2010, Deepmind (artificial neural networks) was launched and IBM introduced Watson a question-answer computer system which could answer questions posed in natural language.

Health AI ecosystems are forming of two main groups with considerable overlap. The front-end group is health and well-being with members/subscribers uploading health data from wearables and cell phones. This creates a huge data pool. AI is perfectly placed to analyze huge datasets and make recommendations in natural language. The emphasis is to keep people healthier



for longer by interventions and guidance. The back-end group is AI Cognitive using the features in Deepmind and Watson to take disparate clinical knowledge sources, aggregate them and then query them to make diagnoses. This is a huge task and largely in its infancy. With the digital transformation of healthcare, these sources can now include every clinical decision recorded in electronic health records.

Biography:

William Flannery is an otolaryngologist and clinical director from the UK. He is a fellow of the Royal College of Surgeons in England and a past fellow of Great Ormond Street Hospital for Sick Children in London. He is an alumnus of the Oxford Artificial Intelligence Programme. He has extensive experience of hospital digital roll-out programmes including electronic patient records, speech recognition software deployment at scale and digital hearing aid rollouts. He is a senior clinical lead for his hospital’s digital transformation and part of the hospital’s clinical AI Hub which co-ordinates academic AI research with clinical trials and the assessment of all AI applications in the hospital. He lectures on deploying Health AI at scale and has presented to alumni at the Harvard Business School Club of London, national conferences and local senior management teams.

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