



Artificial Intelligence - The New Odds in Dentistry

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Introduction and History of Artificial Intelligence (AI)

Artificial intelligence (AI) is a promising and rapidly expanding division of technology that is expected to have a noteworthy effect on dentistry in the future. This article introduces you to the history of AI and its applications in dentistry. The initial stages of contemporary AI are comparable to early philosophers' efforts to define human intelligence as an emblematic scheme. However, it wasn't until 1956 that the discipline of AI was formally recognized when the term artificial intelligence was first used at a conference at Dartmouth College in Hanover, New Hampshire.

Marvin Minsky, a cognitive scientist at MIT, as well as other participants at the event, were very hopeful about the potential that AI could have, "The challenge of developing 'artificial intelligence will largely be solved within a generation," quoted Minsky in the book "AI: The Tumultuous Search for Artificial Intelligence". But achieving this goal wasn't so straightforward.

After numerous information and disapproving improvements in AI, support and recognition from the government in the discipline were weakened during a time that became known as the AI Winter, from 1974-80. During the 1980s, the subject was fortified by the British government, which started to invest in this field again in order to be competitive with projects being developed by the Japanese. From 1987 to 1993,



AI suffered another major decline, which happened simultaneously with the market crash for some of the first general-purpose computers and lowered public funding.

However, in the following period, research accelerated again, and in 1997, Russian chess champion Garry Kasparov became the first human to be defeated by a computer, IBM's Deep Blue. Then, in 2011, a computer won Jeopardy for the first time when Watson, a computer-generated question-answering system, could beat top winners, Brad Rutter and Ken Jennings. Later, Eugene Goostman, a talking computer chatbox, obtained media attention when he deceived judges and made them think he was a real flesh and bones human during a Turing Test in 2011. The Turing Test was created in 1950 by British mathematician and computer scientist Alan Turing and was designed to evaluate the intelligence of a machine.

Now, AI has advanced to a remarkable level. The concept of deep learning, AI, and data science

are trending at rocket speed. Google, Facebook, IBM, and Amazon are creating unique devices using AI. The future of AI and its applications in healthcare and dentistry is exciting and will come with high intelligence.

AI in Dentistry

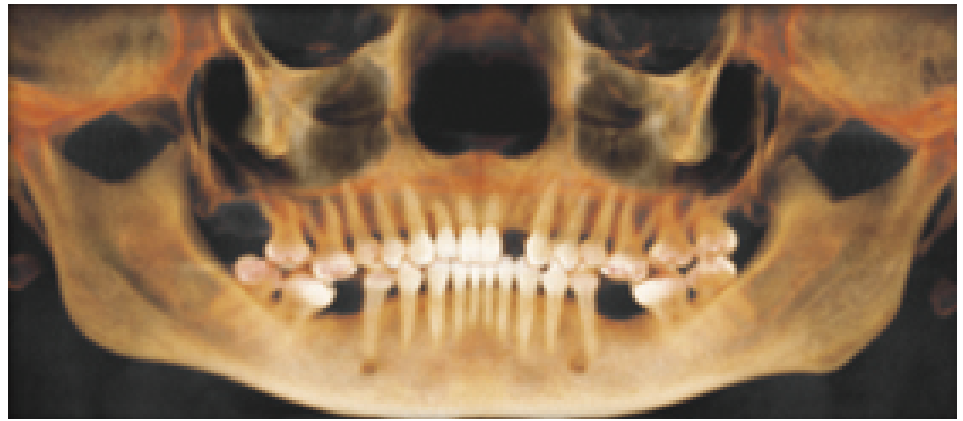
AI in dentistry is only in its earliest stage of development, and a limited number of companies have presented some triumphs in labeling, crown design, and caries detection. Some dental informatics companies utilizing AI have been operating aggressively to acquire initial authorization from the FDA to supply immediate funding to practitioners examining patients. In contrast, some companies have already obtained this authorization. Despite AI being only in its formative years in dentistry, with more resources devoted to its growth, experts predict that it will continue to grow in the coming years and be widely accepted. This technology can adjust to cutting-edge knowledge. These

factors can expand productivity, pose innovative answers to current challenges, and develop a foundation that would have otherwise been impossible in the healthcare industry, not only in the discipline of dentistry.

The application of machine intelligence can be achieved via numerous numerical processes and methods, all aiming to develop programs that can replicate educational or analytical skills. Lately, there has been a significant endorsement of AI in medicine as in diagnostic radiology, cancer diagnosis, and personalized medicine. Several factors influence the uptake and utilization of artificial intelligence in health care and are turning into a paradigm. However, we are not yet fully adapted to this technology in dentistry. Employing these technologies can speed up the digital workflow and reduce human error.

Much of the current exhilaration about AI in healthcare has orbited around the competence of AI models to distinguish anatomy and detect pathology, sometimes at the expert level. However, besides its diagnostic/clinical ability, AI can also perform nondiagnostic/nonclinical tasks. In addition to developments in patient care AI can be invaluable in other areas like laboratories, compensations, due submissions, practice administration, etc.

Most practicing dentists have overlooked problems that were only noticeable later. Utilizing AI allows clinicians to reduce the possibility of error radically. Understanding what factors cause inaccuracies in diagnoses is an ongoing problem in dentistry, and these technologies can provide benefits and create a comprehensive reduction in mistakes. Some of the current clinical applications of AI in dentistry include radiology, orthodontics, periodontics, endodontics, and oral pathology. Labeling, detection, and diagnosis of caries, determining the need for extraction in the



orthodontic treatment plan, predicting periodontally compromised teeth, detection of variation in root canal morphology, and diagnosing some head and neck cancers are examples of clinical applications of AI in dentistry. Imagine a situation at work where you enter an operator and greet a patient. As you begin your physical examination, you can simultaneously refer back to the diagnostic information on your computer that is gathered through the perio chart, photos, radiographs, and other measures, and unbiased and statistically accurate suggestions are given to you to consider. The AI technological tool will be with you as you see each patient and assist in all medical assessments made as a faithful and experienced guide. Additionally, such a tool offers possibilities for treatment suggestions, risks to avoid, and prognoses based on collected data.

Automation is the focus of revolution in the healthcare industry. With the gradual decline in the healthcare worker-to-patient ratio, experts predict that robotics and AI could be used to fill this void. Numerous investigations have demonstrated that tools operated by AI are able to carry out tasks effectively, which eventually ties to better patient outcomes. The goal for clinicians is to deliver quality services that are based on real data, and with AI-operated equipment, we move closer to accomplishing this objective. However, there are certainly numerous challenges

with this development. There are several drawbacks, including bias, missteps, or accidents that might lead to incorrect interpretations and legal, ethical, and privacy concerns. Despite the challenges, the chances of incorporating AI into dentistry in the future are high, and the level of care that can be provided to patients will only get better as we embrace these promising inventions. But for this to take place in the dental industry, new financing resources are needed, as well as indebtedness and appreciation that open systems cause beneficial innovations for the whole industry. If these issues can be resolved, the possibilities are vast.

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