Chapter 15
Revolution Ethics of Data Science and AI

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ABSTRACT

Artificial intelligence is becoming more and more widespread in our increasingly connected world. Artificial intelligence is slowly but surely modifying the way we live and work, from self-driving cars to automated customer service agents. As artificial intelligence becomes more sophisticated, the ethical implications of its use become more complex. There are several key issues to consider regarding the ethics of artificial intelligence, such as data privacy, algorithmic bias, and socioeconomic inequality. The rapid development of AI brings with it several ethical issues. However, we must remain vigilant in protecting our fundamental rights and freedoms. We must ensure that artificial intelligence is not used to discriminate against vulnerable groups or invade our privacy. We must also be careful that AI does not become a tool for the powerful to control and manipulate the masses. But while there are risks, the author believes the potential benefits of AI are too great to ignore.

INTRODUCTION

Data science, big data, and AI have been increasingly recognized as major driving forces for next-generation innovation, economy, and education (Cao, 2017). At a high level, Data Science (DS) is the set of fundamental principles that support and guide the principled extraction of information and knowledge from data. Possibly the most closely related concept to data science is data mining - the actual extraction of knowledge from data via technologies that incorporate these principles (Provost & Fawcett, 2013). The term "Data Science" has emerged in the last few years to make it easier to understand the basic work related to data. Data science technology initially involved only statistical analysis. Finally, it adopted new age technologies such as artificial intelligence (AI), machine learning (ML) and data mining. Data science is an ever-evolving technology with huge potential to bring massive improvements in the future. Although Data Science and Artificial Intelligence have existed since the 1950s, both fields have only very recently experienced a surge in popularity as a result of the expansion in the capabilities of tech-

nology (Ong & Uddin, 2020). Initially Data Science (DS) which is said to be in the form of future data analysis was started in 1962 by John Turey. The traditional database system was created in 1970. After several years, i.e. in 1974, the concept of neural networks was introduced at the NPIS conference. Then again Jacob Zahavi in the year of 1999 introduced data mining for large data sets. He later proposed the Cleveland Data Science Plan again in 2001. In 2005, Big Data was released to maintain a large number of datasets with high processing speed on the server. In 2006, the concept of Deep Learning was again introduced for Algorithm implementations. Then the concept of machine learning was introduced in 2011 by Watson Jeopardy. Finally, in 2018, the Data Science Global Mainstream emerged to handle the processing of large datasets. Similarly the term "artificial intelligence" was coined by John McCarthy in 1956. McCarthy, along with other pioneers such as Marvin Minsky and Claude Shannon, believed that machines could be programmed to mimic human intelligence. The 1980s saw a resurgence in artificial intelligence research, fueled by the development of new algorithms and the availability of powerful computers. In the 1990s, machine learning emerged, allowing computers to learn from data and improve their performance over time.

Table 1. Artificial intelligence and data science evolution comparison

	Data Science	**Artificial Intelligence**
1950-1964	Origination	Origination
1965-1979	Statistics Integration	AI Maturation
1980-1990	KDD	AI Boom
1991-1999	Database Marketing	AI Winter
2000-2004	Internet Integration	AI Agents
2005-2009	Big Data	AI Agents
2010-2014	Data Scientist	Deep Learning, Big Data
2015	AI Integration	Deep Learning, Big Data
2020	NLP, Automated DS	Artificial Narrow Intelligence
2040	Quantum Leap	Artificial General Intelligence
2060	Quantum Computing	Artificial Super Intelligence

Data Science evolution is the result of the inclusion of current technologies such as machine learning (ML), Internet of Things (IoT) and Artificial Intelligence (AI). The application of data science has started to spread to several other fields such as engineering and medicine. Due to the massive influx of new information from all business sectors, businesses are always looking for innovative strategies to increase revenue and improve decision making. Data Science (DS) bridges computer science, statistics, and domain knowledge to uncover the potential concealed in data (Chiarello et al., 2021). The would-be notion takes data science as the science of learning from data, with all that this entails (Donoho, 2017). Using large amounts of data for decision making became practical in the 1980s (Dhar, 2013). The famous back propagation algorithm that David Rumelhart rediscovered in the early 1980s, and which is now considered at the core of the so-called "AI revolution," first arose in the field of control theory in the 1950s and 1960s (Jordan, 2019).

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