



ARISTOTLE CONCEPT OF *TELOS* AND ARTIFICIAL INTELLIGENCE (AI): EXPLORING THE RELEVANCE OF CLASSICAL PHILOSOPHY TO CONTEMPORARY AI DEVELOPMENT

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Key Word: Aristotle, Artificial Intelligence, Ethics, Telos, Hylomorphism, Phronesis, Eudaimonia.	Abstract: <i>Classical philosophy saw the emergence of various schools of thought which spanned from approximately 800 BCE to 500 CE. These schools of thought include pre-Socratic (e.g., Thales, Anaximander, Heraclitus); Socratic philosophy (Socrates, Plato, Xenophon); Aristotelian philosophy (Aristotle, Theophrastus); Hellenistic philosophy (Epicureanism, Stoicism, Skepticism, Neo-Platonism); and Roman philosophy (Cicero, Seneca, Epictetus). This research explores the surprising connections between Aristotle’s philosophical ideas and the development of Artificial Intelligence (AI). The paper attempts to apply Aristotle’s concept of telos to AI development, the paper uncovers valuable insights into the creation of ethical, responsible, and human centered AI systems. The analysis of the paper reveals that Aristotle’s idea can inform AI development in areas such as purpose, design, decision-making, and human-AI interaction. The paper argues further that, incorporating Aristotle’s philosophical framework can enhance AI’s potential to promote human flourishing while mitigating ethical concerns. This interdisciplinary study demonstrates the relevance of classical philosophy to contemporary AI development and encourages further exploration of the intersections between philosophy and technology.</i>
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Introduction

Philosophy as a discipline has the capacity to delve into any given area of endeavor due to its very nature of asking questions and questioning answers that are “unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation”¹. It is in the very nature of philosophy

to ask questions about any emerging ideology or ideas. Ideas are the product of human beings who through thinking bring about solutions to the existential problems of life. Despite the ability of human beings to think and produce ideas; the same human beings question these ideas so as to put in check the application of these ideas into use. Hence, philosophy is a scientific

¹ B. Russell, *The History of Western Philosophy* (New York: Simon & Schuster, 1945) p. xiii

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knowledge² that is exposed to attack it-self and other disciplines. Philosophy can also be seen as an intermediate discipline in the sense that all ‘definite knowledge’³ belongs to science⁴. Science means knowledge⁵ and knowledge comes from science through human beings. Human beings are therefore the producers and users of the product of scientific discoveries “which is made, popularized, confirmed and sometimes rejected”⁶. Therefore, if philosophy seems to be questioner of all things, it must not neglect or ignore technology⁷. This has given rise to the study of philosophy of technology as a sub-branch of philosophy. According to Peter Kroes “it deals with the nature of technology and its effects on human life and society”⁸. The development of AI has transformed various aspects of human life, from healthcare and education to transportation and communication. As AI systems become increasingly integrated into our daily lives, concerns about ethical implications have grown. Philosophers, researchers and policymakers are grappling with questions about AI’s potential impact on human values, morality and flourishing.

Aristotle’s philosophical ideas, particularly his concept of *telos* offer a rich framework for exploring these concerns. Aristotle’s philosophy emphasizes the importance of understanding the purpose and final cause of human actions and entities⁹. His ideas on ethics, human flourishing, and practical wisdom provide a valuable lens through which to examine AI’s development and its potential consequences. Despite the growing interest in AI ethics, there is a scarcity of research that explicitly connects Aristotle’s philosophical ideas to AI development. The paper aims to address this gap by exploring the relevance of Aristotle’s philosophy to AI development, examining how his ideas can inform the creation of ethical, responsible, and human-centered AI systems. The research questions the qualitative analysis of the problem is, how can Aristotle’s philosophical ideas, particularly his concepts of *telos* inform the development of AI systems that promote human flourishing and ethical decision-making?

Biographic Sketch of Aristotle

² E.S. Essien & U.O. Egbai, *History and Philosophy of Science* (Uyo: Akwa Ibom State University Press, 2016) p. 8

³ B. Russell, *The History of Western Philosophy*, p. xiii

⁴ B. Russell, *The History of Western Philosophy*, p. xiii

⁵ E.S. Essien & U.O. Egbai, *History and Philosophy of Science*, p. 8

⁶ E.S. Essien & U.O. Egbai, *History and Philosophy of Science*, p. 9

⁷ W. Sellars, “Philosophy and the Scientific Image of Man”. In *Frontiers of Science and Philosophy* (ed.) R.

Colodny (Pittsburgh: University of Pittsburgh Press, 1962) p. 35

⁸ P. Kroes, “Technology, Philosophy of”. In *Routledge Encyclopedia of Philosophy* (New York: Taylor & Francis, 1998)

<https://www.rep.routledge.com/articles/thematic/technology-philosophy-of/v-1>. Retrieved online 14th July, 2024

⁹ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, 2nd Edition (United Kingdom: Wadsworth Thomson Learning Publication, 2002) p. 78



Aristotle was born in 384 B.C. in the Macedonian town of Stagira¹⁰. Aristotle's father, Nicomachus, was a physician to Amyntus II, the king of Macedonia¹¹. Macedonia was a product of Peloponnesian war in 404 B.C., after the Greek city states were gradually torn apart by unprecedented conflict. As Greece became weaker and fragmented, the nearby empire of Macedonia became stronger until the Greek city-states were conquered by Philip Macedon in 338¹². Macedonia produced the military genius of Alexander the Great (Philip's son), who would conquer the known world at that time. This same province would produce the philosophical genius Aristotle, whose ideas still maintain their hold on significant portions of the philosophical enterprise¹³.

Aristotle's father has a strong influence on him as a physician his father was. It is not unlikely that the scientific, empirical flavor of Aristotle's philosophy, his attention to detail, and his skills at classifying and analyzing the features of nature¹⁴. This becomes the formative orientation in his ability to understand the dynamics involve in the relation between man, nature and culture¹⁵. Aristotle began his academic career

following his father at age eighteen and was highly profiled in the best of education offered in his days and became a student in Plato's Academy in Athens¹⁶. He did not only study in Plato's Academy; he also taught there with Plato for twenty years until the demise of Plato his teacher¹⁷. Aristotle did not remain in Plato's Academy forever; he left the Academy back to Athens in 335 and founded his own research institute, which became a rival to the Academy. It was named the Lyceum because it was near the temple of the god Apollo Lyceus¹⁸. He was the Director of the scientific research institute for the next twelve years and there he wrote most of his major works. The research in the Lyceum ranged over a wide variety of fields, including natural science and history. It contained an extensive library, a museum, and both live and preserved collections of plants and animals.

Aristotle died living a happy family and providing a future for them. He is survived by his wife, children and servants. He had married a woman named Herpyllis after the death of his wife, Pythias. While expressing affection for Herpyllis, he requested to be buried to Pythias.

History of Artificial Intelligence (AI)

¹⁰ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 68

¹¹ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 68

¹² W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 68

¹³ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 68

¹⁴ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 68

¹⁵ P. Kroes, "Technology, Philosophy of". In *Routledge Encyclopedia of Philosophy*,

<https://www.rep.routledge.com/articles/thematic/technology-philosophy-of/v-1>. Retrieved online 14th July, 2024

¹⁶ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 68

¹⁷ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 68

¹⁸ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 69



The history of Artificial Intelligence (AI) in the philosophical epoch of historical development spans several decades and is closely related to and tied to the development of computer science and cognitive science. In Ancient Greece, myths about artificial beings like Talos and Pygmalion, explored the idea of creating life. In Greek mythology, Talos was a giant bronze automaton that was made to protect the city Greek city of Europa from the attacks of pirates and invaders¹⁹. In the 19th – 20th centuries, philosophers like Charles Babbage, Ada Lovelace, and Alan Turing laid the foundation for computer science and AI. The 1950s – 1960s saw the Dartmouth Summer Research Project on AI (1956) and the publication of Turing's *Computer Machinery and Intelligence* (1950) and this marked the beginning of AI as a field²⁰. This paper talked about building intelligent machines capable of making decisions and performing actions and how their intelligence can be tested²¹. According to Aving Singh

The ideas of this paper didn't come to immediate fruition. This was because, for any machine to become intelligent, it must be able to store

commands. This was a significant deterrent in the development of AI post Turing's paper, as the computers in the 1950s were not modern enough to store commands; they could only execute the commands given to them²².

Philosophers in the 1970s – 1980s began and explored the ethical implication of AI through the lens philosophy of mind, cognition and ethics. These philosophers include John Haugeland, Hubert Dreyfus, and Daniel Dennett. The term "Artificial Intelligence" was officially coined at a conference at Dartmouth College by a computer scientist called John McCarthy. He later came to be known as the father of AI. McCarthy, along with Marvin Minsky, Nathaniel Rochester, and Claude Shannon submitted a proposal at the Dartmouth conference, which proposed a two – month long, ten men study at Dartmouth College. The basis of the study was "...the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to stimulate it"²³. This led to an overwhelming philosophical interest in the 1990s – 2000s; with researchers like Rodney

¹⁹ A. Singh, *What is Artificial Intelligence? How Does AI Work? (AI Types, History, and Future* <https://www.koenig-solutions.com/blog/what-is-artificial-intelligence-types-history-and-future> retrieved online 14th July, 2024

²⁰ A. Singh *What is Artificial Intelligence? How Does AI Work? (AI Types, History, and Future* <https://www.koenig-solutions.com/blog/what-is-artificial-intelligence-types-history-and-future>

²¹ M.A. Turing, "Computer Machinery and Intelligence", In the Journal *Mind* (1950), 59 (236), 433-460,

²² A. Singh, *What is Artificial Intelligence? How Does AI Work? (AI Types, History, and Future* <https://www.koenig-solutions.com/blog/what-is-artificial-intelligence-types-history-and-future> retrieved online 14th July, 2024

²³ J. McCarthy, M. Minsky, N. Rochester, & C. Shannon *Proposal for the 1956 Dartmouth Summer Research Project on Artificial Intelligence*. The Proposal was submitted to the Rockefeller Foundation in 1955 and aimed to explore the possibilities of artificial intelligence. It outlined the scope, goals, and potential outcomes of the project, which would later become Dartmouth Conference



Brooks, Daniel C. Dennett, and David Chalmers exploring AI's connections to consciousness, embodiment, and cognitive science.

AI's rapid progress has prompted philosophers to re-examine traditional concepts like intelligence, agency, and morality in the context of AI systems. This is because in 2000, the beginning of the 21st century, the ASIMO robot by Honda, a humanoid robot, starts delivering customer's trays at restaurants²⁴. In the same year, a robot called Kismet is developed by Cynthia Breazeal²⁵. This robot can recognize human emotions and also stimulate them²⁶. In 2014, Google's driverless car passed the self-driving test. In 2016, Hanson Robotics developed Sophia, a social humanoid robot, who became the first robot to get a country's citizenship. Today, artificially intelligent robots are used in every facet of our lives- speech recognition software, smart homes, self-driving cars, etc.

What is Artificial Intelligence?

According to Vijay Kanade an AI researcher, "Artificial Intelligence is defined as the intelligence of a machine or computer that

enables it to imitate or mimic human capabilities"²⁷. AI works as a system that accepts data input in the form of speech, text, image etc. The system then processes data by applying various rules and algorithms, interpreting, predicting, and acting on the input data. Upon processing, the system provides an outcome, i.e., success or failure, on data input. The result is then assessed through analysis, discovery, and feedback. Lastly, the system uses its assessments to adjust input data, rules and algorithms, and target outcomes. This loop continues until the desired result is achieved²⁸.

Stages of Artificial Intelligence (AI)

1. Artificial Narrow Intelligence (ANI): This is also known as weak AI, and most AI systems built till date fall under this category. The machines that follow a narrowly defined set of tasks fall under the ANI stage of AI. At the ANI stage, the machines are devoid of any ability to think and make independent and informed decisions. The functions performed by such

²⁴ A. Singh, *What is Artificial Intelligence? How Does AI Work? (AI Types, History, and Future*

<https://www.koenig-solutions.com/blog/what-is-artificial-intelligence-types-history-and-future> retrieved online 14th July, 2024

²⁵ A. Singh, *What is Artificial Intelligence? How Does AI Work? (AI Types, History, and Future*

<https://www.koenig-solutions.com/blog/what-is-artificial-intelligence-types-history-and-future> retrieved online 14th July, 2024

²⁶ A. Singh, *What is Artificial Intelligence? How Does AI Work? (AI Types, History, and Future*

<https://www.koenig-solutions.com/blog/what-is-artificial-intelligence-types-history-and-future>

[intelligence-types-history-and-future](#) retrieved online 14th July, 2024

²⁷ V. Kanade, *What is Artificial Intelligence (AI)? Definition, Types, Goals, Challenges and Trends in 2022*

<https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-ai/amp/>. Retrieved online 14th July, 2024

²⁸ V. Kanade, *What is Artificial Intelligence (AI)? Definition, Types, Goals, Challenges and Trends in 2022*

<https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-ai/amp/>. Retrieved online 14th July, 2024



machines are pre-defined – for example, self-driving cars.

2. Artificial General Intelligence (AGI):

This is also known as Strong AI, and currently, no robots or machine exists that have AGI. In this stage, machines will have the ability to process information and make informed decisions just like humans. Since these machines will have an autonomous thought process like humans, they are also considered as a threat to the human race by many prominent scientists, include late astrophysicists Stephen Hawkins.

3. Artificial Super Intelligence (ASI):

This is considered the highest stage of machine awareness. Although, hypothetically as of now, ASI is the stage when the machines abilities to think, process, and reason will surpass human beings' intelligence. If in the future one comes across rendition of machines taking over the planet and enslaving or eliminating humanity, it is done by ASI. The popular science fiction movie trilogy. The Matrix is centered on this concept.

Aristotle Concept of *Telos*

The concept *Telos*²⁹ is primarily found in Aristotle's work *Metaphysics*³⁰. It is a central concept in Aristotle's philosophy, which refers to the ultimate purpose, goal, or final cause of something³¹. In other words, *telos* is the reason why something exists, its ultimate destination, or its intended outcome. Aristotle believed that

everything has a *telos*, including living things, objects, and even concepts³². He argued that understanding the *telos* of something is essential to understanding its nature, behavior, and value. In ethical theory, Aristotle argues that all human actions are goal-oriented (teleological), as human reason about the means to achieve certain ends (consequences). For him, the choice of actions to bring about the consequences must be guided by the exercise of reason, conducted in accordance with moral virtues and excellence. In other words, happiness involves excellence and virtues in executing a rational activity to bring about a desired consequence and end.

Action theory also makes essential use of teleological vocabulary. Donald Davidson advances "an action as something an agent does with an intention – looking forward to some end to be achieved by the action"³³. Action is considered just a step that is necessary to fulfill human *telos*, as it leads to habit³⁴

Telos is the root of the modern term *teleology*, the study of purposiveness or of objects with a view to their aims, purposes, or intentions. Teleology is central to Aristotle's work on plant and animal biology, and human ethics, through his theory of the four causes. Aristotle's notion

²⁹ Theological Ethics, Encyclopaedia Britannica (2008)

³⁰ Aristotle, *Metaphysics*. Translated by J. Sachs (US: Green Lion Press, 1999) p. 1

³¹ M.R. Johnson, *Aristotle On Teleology* (Oxford: Oxford University Press, 2005) p. 9

³² W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 79

³³ R. Altshuler & M. J. Sigris, *Time and the Philosophy of Action* (New York: Routledge, 2016) p. 13

³⁴ R. Altshuler & M. J. Sigris, *Time and the Philosophy of Action*, p. 13



that everything has a *telos* also gave rise to epistemology³⁵.

Aristotle Concept of *Telos* and Artificial Intelligence (AI) Development

Aristotle did not mention the word “Artificial Intelligence”; neither did any of his work explore the concept ‘AI’. Nonetheless, one can imply from his works on the purpose for which a *thing is made of; or from which a thing is; and the functionality of such a thing. Telos* and AI purpose are related concepts that explore the idea of purpose and goal-directedness in AI systems. According to William Lawhead “Aristotle’s theories give us a picture of nature as a collection of dynamic processes all pointing to the fulfillment of various ends. This purposeful, goal-oriented structure that Aristotle attributes to the universe is called teleology”³⁶. This comes from the Greek word *telos*, which means end or goal³⁷. Aristotle uses the word *entelechy*³⁸ to describe the end stage of a process, meaning the full actualization of a things form³⁹. The entelechy of an acorn is the oak tree; for the oak does not go on to realize a further end other than

to produce more acorns⁴⁰. According to Aristotle, everything in nature has an inherent purpose or *telos*, guiding its development and actions⁴¹. Applying this concept to AI requires policymakers, researchers and scientists to consider the intended objectives and goals of AI systems. While AI systems lack consciousness and intentions, they are designed by humans with specific purposes. The final cause of AI can be seen as the objectives it is designed to achieve or the tasks it is meant to perform.

The final cause also has ethical implications for AI systems. According to Cristianini Nello “the notion of purpose, or *telos*, has formed the foundation of cybernetics, and now part of the modern analysis of social media platforms as intelligent social machines”⁴². Aristotle’s philosophy emphasizes the importance of living a virtuous life following the ultimate purpose for which we live. Aristotle identified *eudaimonia*⁴³ the good for which human beings ultimately and characteristically aim⁴⁴. According to Lawhead “this should not be confused with pleasure but is best thought of as meaning “well-being” or

³⁵ M. Eagles, *Politics: An Introduction to Modern Democratic Government* (Ontario: Broadview Press, 2008) p. 87

³⁶ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, 2nd Edition (United Kingdom: Wadsworth Thomson Learning Publication, 2002) p. 78

³⁷ In the *Timaeus*, Plato used the notion of teleology to account for the origin and nature of the cosmos as a whole. In W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 78

³⁸ “Entelechy” translates the philosophically rich Greek word *entelecheia* - having (echo) its purpose (*telos*) within (*entos*).

³⁹ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 79

⁴⁰ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 79

⁴¹ A. Kenny, *A New History of Western Philosophy: Ancient Philosophy*, Volume 1 (Oxford: Clarendon Press, 2004) p.93

⁴² N. Cristianini, *The Shortcut: Why Intelligent Machines do not think Like Us* (Boca Raton FL: CRC Press, 2023) p. 12

⁴³ Aristotle, *Nicomachean Ethics*, Book I, 1098a6-15

⁴⁴ F.O.C. Njoku, *Studies in Ethics* (Nsukka: University of Nsukka Press, 2018) p. 115



“living-well” or having a life worth living”⁴⁵. While AI systems lack consciousness and intentions, they are designed by humans with specific purposes and the virtues that ought to be possessed by humans who will enable the individual to achieve *eudaimonia*; and the lack of which will frustrate him towards the *telos*⁴⁶. Therefore, the final goal of all human activity is happiness⁴⁷.

Telos versus Arête

Arête, an ancient Greek concept, refers to excellence, virtue, or speak of performance⁴⁸. In the context of AI, *Arête* can translate into AI systems ought to strive for optimal performance, efficiency, and accuracy, reflecting the concept of virtue. As AI becomes increasingly autonomous, the concept *Arête* can guide the development of AI that is virtuous, ethical, and responsible. *Arête* can inspire humans and AI systems to collaborate and augment each other’s strengths, leading to peak performance and excellence for which a thing is made. In pursuing virtuous path towards AI development, it encourages continuous learning, self-improvement, and refinement, mirroring the concept’s emphasis on striving for excellence.

Telos versus Techne

Telos and *Techne* are two important concepts in philosophy, particularly in the context of ethics,

metaphysics and epistemology. *Techne* refers to art, skill or craft; technical expertise or proficiency; practical knowledge or ability. In essence, *telos* concerns the “why” and *techne* concerns the “how”. Rationality is the basis for the pursuit for the common good. It is also the basis for reducing extremism towards *telos*⁴⁹. To this end, *Telos* is connected with the concept *Techne* which is the rational method involved in producing an object or accomplishing a goal or objective. Charles Griswold argues that *Techne* is referred to as *Telos*; but however, not mutually exclusive in principle⁵⁰. To illustrate the difference, *telos* “what is the purpose of this AI system?” (For example, to improve healthcare outcomes). *Techne* “How do we design and develop this AI system to achieve that purpose?” (E.g. using machine learning algorithms, data analytics, and software engineering).

Aristotle used both concepts to underscore philosophy of Artificial Intelligence and many fields, including AI development, as they help us understand and address questions of purpose, value, and responsible innovation.

Conclusion

The purpose and goal of any human activity is centered on the *telos*. Aristotle’s *telos* is very fundamental to metaphysical pursuit of a flourishing society. A flourishing society is

⁴⁵ W.F. Lawhead, *The Voyage of Discovery: A Historical Introduction to Philosophy*, p. 81

⁴⁶ A Macintyre, *After Virtue: A Study in Moral Theory* (Indiana: University of Notre Dame Press, 1981) p. 148

⁴⁷ J. Baggini, *Philosophy: Key Texts* (New York: Palgrave Macmillan, 2016) p. 14

⁴⁸ R. Rojcewicz, *The Gods and Technology: A Reading of Heidegger* (Albany: State University of New York Press, 2006) p. 64

⁴⁹ F.O.C. Njoku, *Studies in Ethics*, p. 117

⁵⁰ C. Griswold, *Self-Knowledge in Plato’s Phaedrus* (University Park, PA: Pennsylvania State University Press, 2010) p. 160



centered on virtue and a virtuous life. To this end, the use of AI in the thought of Aristotle is centered on the human agency who acts upon machines not to drift from the purpose, function, goal and end for which AI was invented. Aristotle in analyzing the usage of AI systems thinks more of moderation in other not to destroy the end for which a thing is made.

In conclusion, the concepts of *telos* and *techne* are fundamental to understanding the development and application of AI. *Telos* represents the purpose and goals that AI systems aim to achieve, while *techne* embodies the technical expertise and practical knowledge required to create and implement these systems. As we continue to advance AI capabilities, it is essential to consider both *telos* and *techne* in tandem, ensuring that our pursuit of technical excellence is guided by a clear understanding of the purposes and values we seek to uphold.

References

- Altshuler R. & Sigrist J. M, *Time and the Philosophy of Action* (New York: Routledge, 2016)
- Aristotle, *Metaphysics*. Translated by J. Sachs (US: Green Lion Press, 1999)
- Baggini J, *Philosophy: Key Texts* (New York: Palgrave Macmillan, 2016)
- Cristianini N, *The Shortcut: Why Intelligent Machines do not think Like Us* (Boca Raton FL: CRC Press, 2023)
- Eagles M, *Politics: An Introduction to Modern Democratic Government* (Ontario: Broadview Press, 2008)
- Essien S.E & Egbai O.U, *History and Philosophy of Science* (Uyo: Akwa Ibom State University Press, 2016)
- Griswold C, *Self-Knowledge in Plato's Phaedrus* (University Park, PA: Pennsylvania State University Press, 2010)
- Johnson R.M, *Aristotle On Teleology* (Oxford: Oxford University Press, 2005) p. 9
- Kanade V, *What is Artificial Intelligence (AI)? Definition, Types, Goals, Challenges and Trends in 2022*
<https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-ai/amp/>.
- Kenny A, *A New History of Western Philosophy: Ancient Philosophy*, Volume 1 (Oxford: Clarendon Press, 2004)
- Kroes P, "Technology, Philosophy of". In *Routledge Encyclopedia of Philosophy* (New York: Taylor & Francis, 1998)
<https://www.rep.routledge.com/articles/thematic/technology-philosophy-of/v-1>.
- Lawhead F. W, *The Voyage of Discovery: A Historical Introduction to Philosophy*, 2nd Edition (United Kingdom: Wadsworth Thomson Learning Publication, 2002)



Macintyre A, *After Virtue: A Study in Moral Theory* (Indiana: University of Notre Dame Press, 1981)

Njoku O.C.F, *Studies in Ethics* (Nsukka: University of Nsukka Press, 2018)

Rojcewicz R, *The Gods and Technology: A Reading of Heidegger* (Albany: State University of New York Press, 2006)

Russell B, *The History of Western Philosophy* (New York: Simon & Schuster, 1945)

Sellars W, “Philosophy and the Scientific Image of Man”. In *Frontiers of Science and Philosophy* (ed.) R. Colodny (Pittsburgh: University of Pittsburgh Press, 1962) p. 35

Singh A. *What is Artificial Intelligence? How Does AI Work? (AI Types, History, and Future* <https://www.koenig-solutions.com/blog/what-is-artificial-intelligence-types-history-and-future>

Turing A.M, “Computer Machinery and Intelligence”, In the Journal *Mind* (1950), 59 (236), 433-460