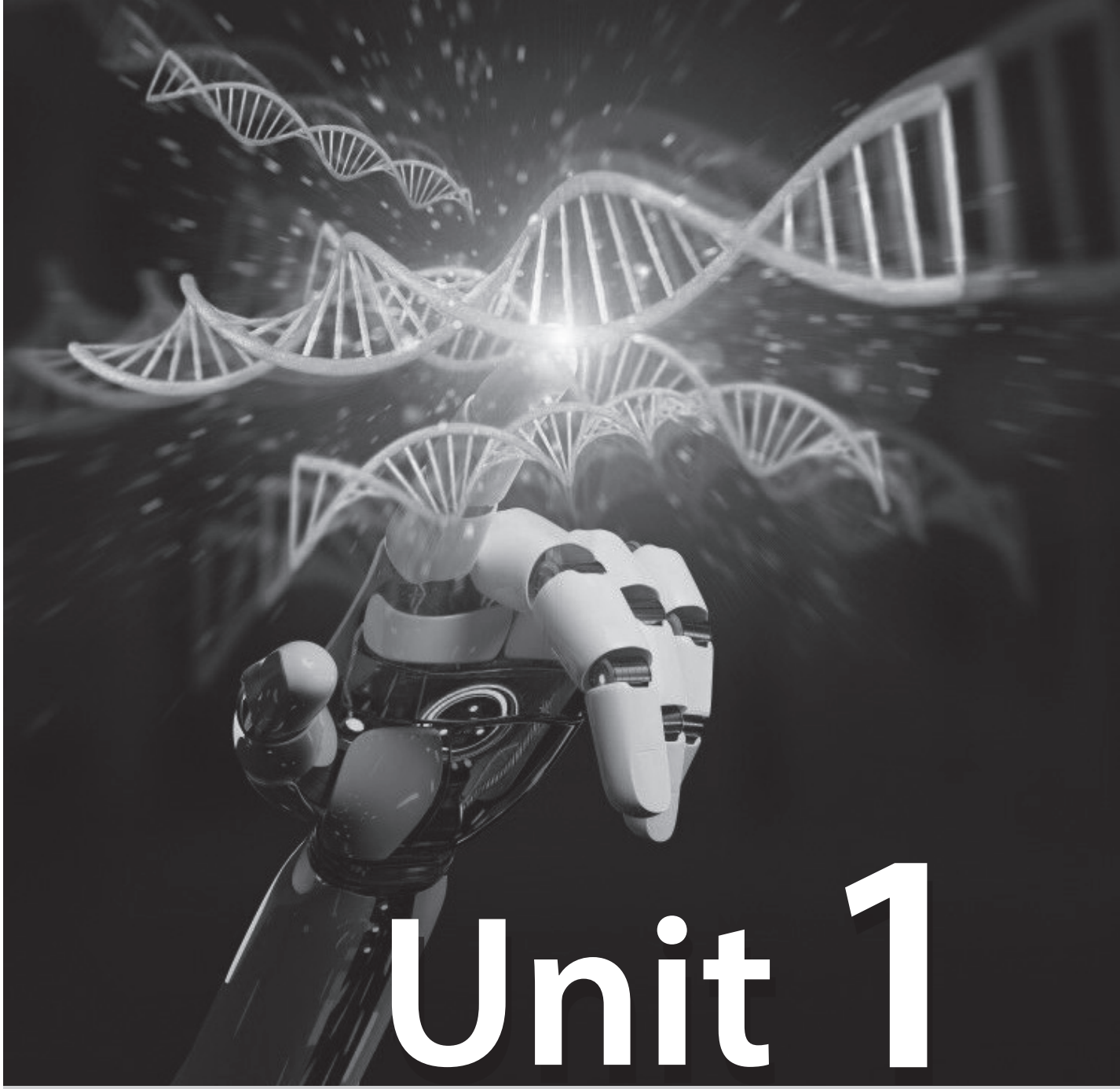

Unit 1

An Overview of Artificial Intelligence

Learning Objectives

In this unit, you will learn:

- an overview of artificial intelligence;
- the history of artificial intelligence;
- the current state of artificial intelligence;
- writing skills—different ways of defining;
- translating skills—translation of the passive voice.

Lead-in

I. Discuss the following questions with your partners.

1. How much do you know about artificial intelligence?
2. What are the goals of artificial intelligence?
3. In what ways can artificial intelligence influence people's life and work?

II. Work in pairs to discuss the advantages and disadvantages of artificial intelligence.

Advantages:

1. _____
2. _____
3. _____

Disadvantages:

1. _____
2. _____
3. _____

Text A

An Overview of Artificial Intelligence

1 Since the invention of computers or machines, their capability to perform various tasks went on growing **exponentially**. The power of computer systems **in terms of** their **diverse** working **domains**, their increasing speed, and their reducing size **with respect to** time has been greatly developed.

2 A branch of computer science named artificial intelligence (AI) pursues creating computers or machines as intelligent as human beings.

What Is Artificial Intelligence?

3 According to the father of artificial intelligence, John McCarthy, it is "the science and engineering of making intelligent machines, especially intelligent computer programs".

4 Artificial intelligence is a way of making a computer, a computer-controlled robot, or a piece of software that can think as intelligently as humans.

5 AI is accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems.

6 It is one thing to explain why AI is exciting; however, it is another to explain what AI is. We could just say, "Well, it has to do with smart programs, so let's get on and write some." But the history of science shows that with the right goal, AI is developing in the right direction. Early **alchemists**, looking for a **potion** for eternal life and a method to **turn** lead **into** gold, **were** probably **off on the wrong foot**. The scientific method could emerge and productive science could take place when the aim changed to find **explicit** theories that gave accurate predictions of the **terrestrial** world, in the same way that early astronomy predicted the apparent motions of the stars and planets.

Philosophy of Artificial Intelligence

7 The study of the power of the computer system arouses human's curiosity: Can a machine think and behave like humans do?

8 Thus, the development of AI started with the intention of creating similar intelligence in machines that we find and regard high in humans.

Goals of Artificial Intelligence

9 The goals of developing AI are:

- To create expert systems—the systems which display intelligent behavior, learn, demonstrate, explain, and advise its users.
- To implement human intelligence in machines—creating systems that can think and act as intelligently as humans.

What Contributes to Artificial Intelligence?

10 **Disciplines** involved in artificial intelligence include computer science, biology, psychology, linguistics, mathematics, and engineering. A major thrust of AI is in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem-solving.

Applications of Artificial Intelligence

11 AI has been extensively used in various fields such as:

- Gaming—AI plays a crucial role in strategic games such as chess, poker, tic-tac-toe, etc., where machines can think of a large number of possible positions based on **heuristic** knowledge.
- Natural language processing—it is possible to interact with the computer that understands natural language spoken by humans.
- Expert systems—there are some applications which integrate machine, software, and special information to impart reasoning and advising. They provide explanation and professional advice for the users.
- Vision systems—these systems distinguish and interpret visual input on the computer. For example, a spying aeroplane takes photographs and the photographs can be used to analyze spatial information or map of the areas. Clinical expert systems can help doctors better **diagnose** and treat patients. With the help of computer systems, police can recognize the appearance of criminals with the stored portrait made by **forensic** artist.
- Speech recognition—some intelligent systems are capable of hearing and comprehending the language a human talks to them. They can deal with different accents, slang words, the background noise, even the change in human's sound due to cold, etc.
- Handwriting recognition—all texts written on paper by a pen or on screen by a **stylus** are readable via the handwriting recognition system, which can "read" the shapes of the letters and change them into editable text.
- Intelligent robots—robots are capable of performing the tasks assigned by a human. They have sensors to collect and analyze physical data from the real world such as light, heat, temperature, movement, sound, bump, and pressure. They are called intelligent robots just because they have efficient processors, multiple sensors, and huge memory. Additionally,

they can improve themselves by learning from their mistakes and adapting to the new environment.

12 AI addresses one of the ultimate puzzles. How can a slow, tiny brain, biological or electronic, **perceive**, understand, predict, and manipulate a world far larger and more complicated than itself? How do we go about making something with those properties? It is not easy to answer these questions, but unlike the search for faster-than-light travel or an **antigravity** device, the researchers in AI have solid evidence that the quest is possible. All the researchers have to do is to look in the mirror to see an example of an intelligent system.

13 AI is one of the freshest disciplines. It was formally initiated in 1956, when the name was coined, although at that point work had been **underway** for about five years. Along with modern **genetics**, it is regularly cited as the "field I would most like to be in" by scientists in other disciplines. A student in physics might have good reasons to feel that all the great ideas have already been taken by Galileo, Newton, Einstein, and other outstanding scientists, and that it takes many years of study before one can contribute new ideas. AI, on the other hand, still has openings for a full-time Einstein.

Notes

John McCarthy an American computer scientist and cognitive scientist. McCarthy was one of the founders of the discipline of artificial intelligence. He coined the term "artificial intelligence", developed the Lisp programming language family, significantly influenced the design of the ALGOL programming language, popularized timesharing, and was very influential in the early development of AI.

tic-tac-toe also known as noughts and crosses, or Os and Xs, a paper-and-pencil game for two players, O and X, who take turns marking the spaces in a 3 × 3 grid. The player who succeeds in placing three of his marks in a horizontal, vertical, or diagonal row wins the game.

Galileo an Italian astronomer, physicist, and engineer, who was sometimes described as a polymath. Galileo has been called the father of observational astronomy, the father of modern physics, the father of the scientific method, and the father of modern science.

Newton an English mathematician, physicist, astronomer, theologian, and author (described in his own day as a "natural philosopher"), who is widely recognized as one of the most influential scientists of all time, and a key figure in the Scientific Revolution (1500–1750).

Einstein a German-born theoretical physicist who developed the theory of relativity, one of the two pillars of modern physics (alongside quantum mechanics). His work is also known for its influence on the philosophy of science. He is

best known to the general public for his mass-energy equivalence formula $E = mc^2$, which has been dubbed "the world's most famous equation". He received the 1921 Nobel Prize in Physics "for his services to theoretical physics, and especially for his discovery of the law of the photoelectric effect", a pivotal step in the development of quantum theory.

Words and Expressions

exponentially	/ˌekspəˈnenʃəli/	*adv.*	in a way that becomes faster and faster 以指数方式
in terms of			with regard to 从……的角度；用……来表示
diverse	/daɪˈvɜːs/	*adj.*	very different from each other and of various kinds 不同的；变化多的
domain	/dəʊˈmeɪn/	*n.*	an area of knowledge or activity, especially one that somebody is responsible for （知识、活动的）领域，范围
with respect to			in relation to 关于；谈到
alchemist	/ˈælkəmɪst/	*n.*	one who is versed in the practice of alchemy and who seeks an elixir of life and a panacea 炼金术士
potion	/ˈpəʊʃn/	*n.*	a drink of medicine or poison; a liquid with magic power 药饮；毒液；魔水
turn…into			to make somebody/something become somebody/something else 把……转变成……
be off on the wrong foot			to begin a relationship or project badly 一开始就错了
explicit	/ɪkˈsplɪsɪt/	*adj.*	clear and easy to understand, so that you have no doubt what is meant 详尽的；明确的
terrestrial	/təˈrestriəl/	*adj.*	connected with the planet Earth 地球上的
discipline	/ˈdɪsəplɪn/	*n.*	a subject that people study or are taught, especially in a university; an area of knowledge （大学）学科；知识领域
heuristic	/hjʊəˈrɪstɪk/	*adj.*	enabling a person to discover or learn something for himself/herself 启发式的
diagnose	/ˈdaɪəgnəʊz/	*v.*	to say exactly what an illness or the cause of a problem is 诊断
forensic	/fəˈrenzɪk/	*adj.*	connected with the scientific tests used by the police when trying to solve a crime 法医的
stylus	/ˈstaɪləs/	*n.*	a special pen used to write text or draw an image on a

special computer screen 触笔；指示笔

perceive	/pəˈsiːv/	*v.*	to notice or become aware of something 觉察，意识到
antigravity	/ˌæntiˈgrævɪti/	*n.*	an imaginary force that works against gravity 反重力，反引力
underway	/ˌʌndəˈweɪ/	*adj.*	currently in progress 进行中的
genetics	/dʒəˈnetɪks/	*n.*	scientific study of the ways in which different characteristics are passed from each generation of living things to the next 遗传学

Useful Terms

working domain	工作领域
spying aeroplane	侦察飞机
forensic artist	法医艺术家

Exercises

Comprehension Check

I. Answer the following questions according to the text.

1. Who is the father of artificial intelligence?
2. What is the philosophy of artificial intelligence?
3. What are the goals of artificial intelligence?
4. What is the basis of the research in artificial intelligence?
5. In what ways can artificial intelligence help the police?

II. Read the following statements carefully and decide whether they are true (T) or false (F) without turning back to check the text.

1. _____ Artificial intelligence aims at making a computer or a piece of software that can think more intelligently than human beings.
2. _____ The development of artificial intelligence is based on the study of the

way human beings think, learn, and work.

3. _____ It is the goal of finding theories that can lead scientists to make breakthroughs in productive science.

4. _____ Artificial intelligence is a science that is closely related to physics.

5. _____ Artificial intelligence can be reliable when people need theoretical explanation or technical advice.

III. Choose the best answer to each of the following questions according to the text.

1. Artificial intelligence is the science and engineering of _____.

   A. creating machines that can calculate faster than human beings

   B. creating systems that can think, learn, and understand as intelligently as human beings

   C. creating machines that can store larger amounts of data than human beings

   D. creating systems that can think, decide, and reason better than human beings

2. Artificial intelligence can be applied in the following fields EXCEPT _____.

   A. playing games

   B. handling different accents and voices

   C. going into the war

   D. performing extreme tasks

3. The handwriting recognition system can read texts by _____.

   A. analyzing the grammatical rules

   B. translating the texts

   C. scanning the key information

   D. identifying the shapes of the letters

4. It is possible for AI to become more advanced if scientists can _____.

   A. study how computers work normally

   B. study how human brain works normally

   C. study how large amounts of data can be stored

   D. study how computing speed can be increased

5. Why does the author mention "a full-time Einstein"?

   A. Because AI is a new field in which anyone can make new discoveries and contributions.

B. Because AI is a brand-new field in which scientists have to give up their previous research.

C. Because AI is so complex that only those top scientists can do research in it.

D. Because AI is such a complicated study that one has to fully concentrate on it.

Vocabulary Building

IV. Fill in the following blanks with the words and phrases given in the box. Change the form if necessary.

diverse	pursue	explicit	prediction	function
discipline	underway	in terms of	turn…into	be associated with

1. People with a wide range of _____ are more competitive in the job market.
2. Plans are already _____ for the optimization of the application system.
3. Global warming _____ people's life closely and disastrous consequences would be unavoidable if we don't do anything to cope with it.
4. No one should make a(n) _____ about which IT product would be the most popular in the coming years.
5. All the top universities in the world are appealing to students from all over the world not only because of their excellence in teaching and researching but also because of their cultural _____.
6. The Republic of Botswana is a small country _____ size and population.
7. An increasing number of college students start to _____ their own business after they graduate.
8. It took them three weeks to _____ the old car park _____ a playing ground for the residents nearby.
9. The equipment is now _____ normally thanks to the maintenance of the engineers.
10. The professor has been talking _____ about the development and application of AI.

V. Match the words in the left column with the explanations in the right column.

1.	robot	A.	the branch of physics that studies celestial bodies and the universe as a whole
2.	prediction	B.	of extreme importance

3.	astronomy	**C.**	a mechanism that can move automatically
4.	crucial	**D.**	involving several
5.	multiple	**E.**	the statement made about the future

Word Formation

VI. Fill in the following blanks with the words in capitals. Change the form if necessary. An example has been given.

e.g. *It can recognize the shape of the letters and convert it into editable text.* **EDIT**

1. The installation of _____ traffic signs is expected to be effective in reducing the number of accidents in the city. **CHANGE**

2. The seats in this theater are _____ so that the audience will feel comfortable while watching the performance on the stage. **ADJUST**

3. The mailman had trouble in sending the parcel because the address on it was not _____. **READ**

4. It's _____ that she was annoyed by such an offensive behavior. **UNDERSTAND**

5. The project didn't go as we had expected because of some _____ reasons. **SEE**

Translation

VII. Translate the following sentences into English with the words and phrases in brackets.

1. 人工智能是指一种能够像人一样思考的电脑或者由电脑控制的机器。(as…as)

_____

_____

2. 人工智能研发需要整合诸多学科，如计算机科学、生物学、心理学、语言学、数学、工程学等。(discipline; involve in)

_____

_____