

## Rezeption II: Leseverstehen

20 Punkte

Sie sind Auszubildende/r bei Adler Network Components in Duisburg und sollen eine Präsentation auf Deutsch über künstliche Intelligenz halten. Sie haben einen Text im Internet gefunden und bereiten sich mithilfe dessen vor.

Machen Sie sich stichwortartige Notizen auf Deutsch zu folgenden Punkten:

Leistungen, für die Alan Turing weltbekannt wurde:	<input type="text"/>
Kurze Beschreibung des Turing-Tests:	<input type="text"/>
Turings Prophezeiung:	<input type="text"/>
Anforderungen an die Gewinner eines Loebner-Preises:	<input type="text"/>
Kritik am Turing-Test:	<input type="text"/>
Programmierung/Funktionsweise von DeepBlue:	<input type="text"/>
Programmierung/Funktionsweise von AlphaGo:	<input type="text"/>
Programmierung/Funktionsweise von Libratus:	<input type="text"/>
Grenzen der künstlichen Intelligenz:	<input type="text"/>

## Can computers think?

Alan Turing was a brilliant mathematician who became famous for cracking the 'Enigma' code used by the German armed forces to send secret messages to their troops during the Second World War. This task was extremely difficult as the code changed daily. It has been estimated that the efforts of Turing shortened the war by more than two years and saved more than 14 million lives.

In 1950, in a paper entitled *Computing Machinery and Intelligence* Turing asked the following questions "Can machines think?" And if a computer could think, "How could we tell?" He suggested a test, known as the Turing Test: A human judge has a chat via a keyboard with a computer program and with a human being. The computer passes the test if, after five minutes, the judge cannot tell which is the computer and which is the human. Turing predicted that by the year 2000 the average judge would not have more than a 70 per cent chance of making the right identification.

In 1990 Hugh Loebner set up a prize of \$4,000 for the first chatbot to pass the original text-based Turing Test. He also donated another prize of \$25,000 for the creators of the first chatbot that the judges consider to be human-like, and he also set up a reward of \$100,000 for the first program that judges cannot distinguish from a real human in a 30-minute Turing Test that includes understanding text, visual and voice input. This annual competition in artificial intelligence will only come to an end once the \$100,000 has been won: as the main prize hasn't been awarded to anyone so far, the competition is still going on.

Steve Worswick's Mitsuku, possibly the world's best conversational chatbot, is a three-time winner of a Loebner medal. In 2017, after four rounds of chat sessions, it received the top ranking among the four competitors and was awarded the Loebner bronze medal in the annual Turing Test. When one judge asked: "What did you learn today?" Mitsuki answered: "I learned a bit more about human behaviour and relationships." Still the question remains whether the Turing Test is an adequate test of intelligence. Are the prize-winning chatbots nothing other than cleverly-coded pieces of software programmed to fool the judges, as some scientists think?

In the years since Turing, more artificially-intelligent machines have been created that are smart enough to defeat the best players in games of logic and skill. In 1997, IBM's DeepBlue was able to beat Garry Kasparov, the world chess champion. AlphaGo played thousands of games against itself before it was able to beat the world champion in 2017. In 2017, Libratus, a computer poker program, beat the world's top poker players by a margin of \$1.2 million.

DeepBlue defeated Kasparov mainly thanks to its immense computing power. It had learned and analysed thousands of master games, and between games its developers were allowed to fine-tune the program. AlphaGo and Libratus are more intelligent. AlphaGo learned by reinforcement. It played a large number of games against itself and learned from experience based on feedback from previous games. Libratus does not have a fixed built-in strategy, but an algorithm that decides on its moves step by step.

However, all these artificially-intelligent computers cannot think the way humans think. They are programmed to do just one particular task. As long as we do not fully understand how our brain works, we will not be able to build machines that learn new things the way a clever child can.