

Dead Sea Scrolls older than previously thought says AI.

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An AI trained on radiocarbon dating suggests some Dead Sea Scrolls might be older than previously thought. The findings could reshape our understanding of Judaism and early Christianity. The Dead Sea Scrolls are more than 2,000 years old and contain some of the oldest known texts from the Hebrew Bible.

An AI program trained to study the handwriting styles of ancient manuscripts suggests many of the Dead Sea Scrolls might be older than previously thought, as reported in a study published in the journal Plos One on Wednesday. The study is the latest entry in a new era of antiquity studies that has researchers use AI to reveal the secrets written on frayed and crumbling scrolls. The new method combines AI, radiocarbon dating, and handwriting analysis to estimate an ancient text's age more accurately. The now proposed redating could reshape our understanding of the Dead Sea Scrolls, and of Judaism and early Christianity, the authors of the study say.

"It is very exciting to set a significant step into solving the dating problem of the Dead Sea Scrolls and also creating a new tool that could be used to study other partially dated manuscript collections from history," said study author Mladen Popovic from the University of Groningen, The Netherlands.

Radiocarbon dating and AI analysis of handwriting.

The Dead Sea Scrolls, the first of which were discovered in a cave in Israel in 1947, are the most momentous manuscript discovery of the past hundred years. There are around 1,000 manuscripts in the Dead Sea Scrolls. Among them are some of the oldest known copies of texts from the Hebrew Bible. Studies of these manuscripts have profoundly changed understanding of the origins of Christianity and the formation of post-biblical Judaism. Dating these manuscripts with palaeography — the study of ancient handwriting — reveals them to have been written over several hundred years between 250 B.C.E. and 100 C.E. However, scholars have struggled to analyse ancient texts,

particularly with distinguishing one writer's style from another, meaning dating isn't very reliable.

The researchers aimed to improve analytical methods by using AI to study handwriting and cross-reference this data with radiocarbon dating. Radiocarbon dating estimates the age of materials by measuring carbon-14 isotopes that slowly disappear over time. "The advantage of the [AI] model is that it provides quantified objectivity to palaeography, reducing the method's subjectivity," the authors write.

An AI model was first trained on 24 manuscripts with reliable radiocarbon dating. The authors then used this AI model to analyse the handwriting style of 135 scrolls with unknown dates spanning three centuries from around 200 B.C.E. to 100 C.E. This created a better way of dating written manuscripts with 79% accuracy, according to the analysis.

"This novel approach allowed [the researchers] to combine historical expertise with technical precision," said Thea Sommerschild and Yannis Assael, who previously developed AI tools for the study of ancient texts at the University of Oxford, UK, in a joint email to DW. Sommerschild and Assael were not involved in the study.

New Dead Sea Scroll chronology.

The authors of the study believe their analysis could lead to a new chronology of the scrolls. If verified, it would change understanding of the history of ancient Judea and the people who wrote the texts. The AI analysis found the manuscripts are older than previous estimates overall, suggesting dates in the early second century B.C.E., and sometimes slightly earlier. Scholars often assume that the rise and expansion of the Hasmonaean kingdom from the mid-second century B.C.E. onward caused a rise in "literacy scribal intellectual culture." The authors say their findings suggest that scribes were copying multiple literary manuscripts before this period. Sommerschild and Assael say the new study shows AI could be used to provide more accurate dating of other ancient texts. "This new study shows that computational tools don't diminish the role of human expertise, they enhance it, opening new paths for discovery in even the most well-studied texts," they said in their email. Antiquity scholars believe they are on the brink of a new era of because of AI. Researchers have also, for example, been using AI to translate ancient texts that have been vexing ancient scholars for decades.