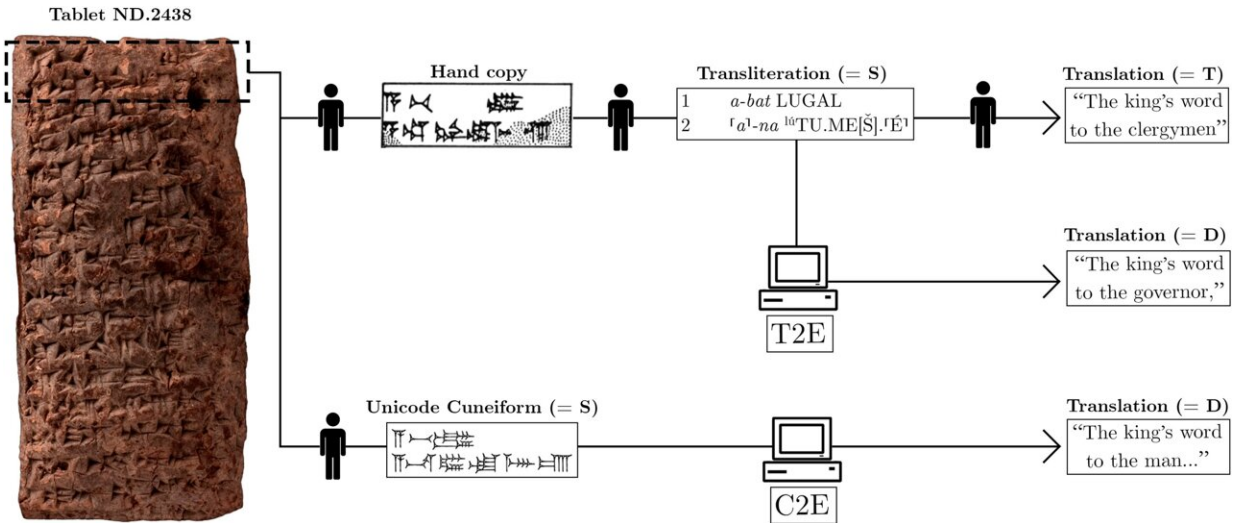


Machine translation for cuneiform tablets

May 3 2023



A schematic overview of the NMT model's pipeline. The short designations in parentheses follow the conventions of the test set provided in the SI: the source or input is S, the original HT is T, and the output machine translation is D. Image of the tablet ND.2438 available on the website of the Cuneiform Digital Library Initiative (CDLI: <https://cdli.ucla.edu/P393604>). © The Trustees of the British Museum. Credit: *PNAS Nexus* (2023). DOI: 10.1093/pnasnexus/pgad096

An AI model has been developed to automatically translate Akkadian text written in cuneiform into English. Hundreds of thousands of clay tablets from ancient Mesopotamia, written in cuneiform and dating back as far as 3,400 BCE, have been found by archaeologists, far more than could easily be translated by the limited number of experts who can read them.

Shai Gordin and colleagues present a new machine learning model that can automatically translate Akkadian cuneiform into English. Two versions of the model were trained. The research is published in the journal *PNAS Nexus*.

One version translates the Akkadian from representations of the cuneiform signs in Latin script (transliterations). Another version of the model translates from unicode representations of the cuneiform signs.

The first version, using Latin transliteration, gave more satisfactory results in this study, achieving a score of 37.47 in the Best Bilingual Evaluation Understudy 4 (BLEU4), a test of the level of correspondence between machine and human [translation](#) of the same text.

The program is most effective when translating sentences of 118 or fewer characters. In some of the sentences, the program produced "hallucinations"—output that was syntactically correct in English but not accurate to the Akkadian meaning.

But in the majority of cases, the translation would be usable as a first-pass at the text. The authors propose that [machine translation](#) can be used as part of a "human-machine collaboration," in which human scholars correct and refine the models' output.

More information: Gai Gutherz et al, Translating Akkadian to English with neural machine translation, *PNAS Nexus* (2023). [DOI: 10.1093/pnasnexus/pgad096](https://doi.org/10.1093/pnasnexus/pgad096)

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