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Mining EHR Data for Improved Outcomes

Increasing use of EHRs makes them a valuable source of important clinical data. Currently, three large academic medical centres in the U.S. are working with Google to explore how the company's machine learning technology can be used to spot patterns in EHRs.

"Machine learning is mature enough to start accurately predicting medical events – such as whether patients will be hospitalised, how long they will stay, and whether their health is deteriorating despite treatment for conditions such as urinary tract infections, pneumonia, or heart failure," Google Brain Team researcher Katherine Chou points out.

In particular, Google Brain is interested in putting machine learning to work predicting and preventing healthcare-associated infections, medication errors and hospital readmissions. The company will be helping "to harmonise the different ways data appears" among its partner hospitals.

Google's partners in this machine learning research project are Stanford Medicine, UC San Francisco, and University of Chicago Medicine. As part of this research, the healthcare partners ensured that patient data was appropriately de-identified prior to sharing, according to Chou. The team then used Google Cloud's infrastructure to keep the data stored securely with the highest level of protections and to strictly follow HIPAA privacy rules. "The records are kept separate from consumer data and will only be used in our partnership research projects," Chou says.

Advanced machine learning can discover patterns in de-identified medical records to predict what is likely to happen next, and thus, anticipate the needs of the patients before they arise, she explains.

Google's deep learning technology, working in tandem with HL7's FHIR interoperability standard, can help automate standardisation and data exchange, making the data easier for researchers to access, Chou continues.

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