

Google patent indicates plans to develop EHR to predict patients' clinical outcomes

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A Google patent indicates plans to develop a new EHR to provide healthcare providers with predictions for patients' clinical outcomes.

Photo by: Getty/SpVVK

Google appears to have plans to develop its own electronic health record (EHR) for clinicians that gathers patients' medical records and then leverages machine learning to predict clinical outcomes, according to a patent application published by the U.S. Patent and Trademark Office last week.

First reported by Politico today, the patent application was filed back in August 2017. Among the inventors on the application are more than 20 Google employees, particularly from the Google Brain team, or its artificial intelligence division, including AI head Jeffrey Dean.

The 40-page application describes a new computer system, with a healthcare provider-facing interface, that predicts and summarizes medical events from EHRs.

The application describes a system consisting of three parts: a computer memory storing aggregated health records from millions of patients, a computer system executing deep learning models on patients' health records converted into single standardized data structure format, and an interface, displayed on a computer terminal, tablet or smartphone, that displays predictions for future clinical events and pertinent past medical events for patients.

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The computer system would store aggregated EHR data from patients of diverse ages, health conditions and demographics, including medications, laboratory values, diagnoses, vital signs and medical notes, according to the patent application.

The inventors note in the application that there is a need for systems and methods to assist healthcare providers to allocate their attention efficiently among the overabundance of information from diverse sources, as well as to provide predictions of future clinical events and highlight relevant underlying medical events contributing to these predictions in a timely manner. The invention addresses a pressing question facing the physician in the hospital, the inventors wrote, “namely, which patients have the highest need for my attention now, and, at an individual level, what information in the patient’s chart should I attend to?”

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The patent application includes an example of how the deep learning EHR's clinical predictions could aid physicians in patient care. In the hypothetical example, a patient comes to the emergency room for abdominal pain; his alcohol withdrawal symptoms are mistaken for sepsis and he is given the wrong treatment. The computer system described in the patent would be able to flag clinicians' notes regarding concerns about alcohol withdrawal and would alert physicians' attention earlier that the patient was at risk, according to the inventors.

Google continues to make strategic moves into healthcare, including products such as Google Fit and Google Nest. It also has its life sciences spinout Verily and has backed biotechs like Calico.

In November, the company tapped Geisinger Health System's former CEO, David Feinberg, M.D., to help organize its fragmented health initiatives. Former Cleveland Clinic CEO Toby Cosgrove, M.D., has also joined Google Cloud's healthcare and life sciences team as an executive adviser.

A Google spokesperson did not immediately respond to a request for comment on the recent patent application. According to the Politico article, a spokesperson pointed to an article Google scientists published in the journal Nature last May that described a similar project—using deep learning on EHRs to develop clinical predictions.

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The Google scientists—in collaboration with medical researchers from UC San Francisco, Stanford Medicine and The University of Chicago Medicine—describe using Fast Healthcare Interoperability Resources to create a standardized data format for aggregated EHR data and then using deep learning models to make clinical predictions.

In a blog post, Google scientists noted that the deep learning model is not diagnosing patients but rather, “it picks up signals about the patient, their treatments and notes written by their clinicians, so the model is more like a good listener than a master diagnostician.”