

YITU Healthcare publishes major AI breakthrough

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YITU Healthcare has successfully used natural language processing (NLP) to achieve high accuracy rates on par with doctors when reading electronic health records and generating patient diagnoses.

The result is published on Nature Medicine under “Evaluation and Accurate Diagnoses of Pediatric Diseases using Artificial Intelligence”. It's the first time for a top medical journal to publish research findings related to employing NLP technology in making clinical diagnoses.

The system has achieved high accuracy of many dangerous conditions including acute asthma exacerbations (97%), bacterial meningitis (93%), varicella (93%), influenza (94%), roseola (93%). YITU Healthcare joined hands with Guangzhou Women and Children's Medical centre and other research institutions to make this seminal breakthrough.

Using YITU's deep learning based NLP system to extract clinically relevant information and establish a diagnostic system, the team proposed a model for electronic health record data that integrates prior medical knowledge and data-driven modeling. The model has been applied in a large pediatric population and shows a strong performance in accuracy across multiple organ systems.

“It proves AI technology is able to assist doctors to deal with large amount of data and diagnose, as well as provide support in uncertain and complex medical cases,” said Ni Hao, president of YITU Healthcare. “Pediatric diseases can be tricky for doctors. An AI assistant will profoundly improve the diagnosis process and increase efficiency.”

The research has collected 101.6 million data points from over 1.36 million outpatient visits from January 2016 to July 2017 in Guangzhou Women and Children's Medical centre to train and validate the model. The primary diagnoses included 55 diagnosis codes encompassing common diseases in pediatrics and representing a wide range of pathologies. The diagnostic system achieved a robust performance for two categories of pediatric disease: common conditions and dangerous potentially life-threatening conditions.

The system has great potentials for clinical use, for example triage procedures. It generates predicted diagnosis with inputs of basic medical history, vital signs and physical exams from patients. These predictions help doctors make better use of precious time. The system can also assist physicians to diagnose complex or rare conditions to avoid misjudgments or

biases. Most importantly, the system will provide high quality healthcare service as well as ease the tension of severe shortage of experienced pediatrics in China, benefiting both patients and doctors.