Hack Aotearoa

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Collaboration for better medicine with AI

by Hai Sue Kang

Collaboration between doctors and computers may be the key to successful artificial intelligence (AI) in medicine, says Dr Joy Wu.

"Machine learning is a useful tool, but it's not magic," says Dr Wu, a New Zealand medical doctor turned clinical informatics research scientist at IBM Almaden Research Center.

The first step for creating a useful AI model is finding good data.

Healthcare data can be either structured, such as blood pressure readings, or unstructured, such as notes written in free text.

Most healthcare data is unstructured, Dr Wu says, which makes it hard to use the data.

"Is [data] representative? Or biased at entry? And are there sufficient examples? Is it labelled?

"An AI model requires 'labels' or 'ground truths' to work, but healthcare data is mostly unlabelled or unstructured. Clinician expertise is required to make sense of it all," she says.

Manually sorting unstructured data, such as medical records or x-ray images, is expensive and labour-intensive. But machine learning can help extract and organise data faster.

"Humans and computers are good at different things," says Dr Wu.

She gave the example of her 3-year old son who could identify elephants in real-life photographs moments after learning what a cartoon-drawing of an elephant looks like – something modern AI would struggle to do.

"Humans are experts at abstraction; computers are great at discriminating little differences," she says.

"Computers + humans is intelligence augmentation."

Dr Wu described how she had trained a machine learning algorithm to read written notes and identify patients who had not taken their medications properly.

She had to personally teach the algorithm to recognise several different ways written notes might imply this, such as a doctor writing "medication non-compliance" or questioning the patient's compliance.

"We [humans] can identify features that matter, teaching AI models some common sense."

The key to achieving AI's potential to improve medicine, according to Dr Wu, is collaboration.

"Arguably the hardest step is picking the right problems…it requires inter-disciplinary collaboration.

"Think: what are the goals? Advance science? Guide best clinical practice? Reflect service operations? "Then translate into appropriate modelling algorithms."

Dr Wu calls for medical professionals to collaborate with data scientists, statisticians, and computer scientists to identify and extract good data, training models appropriately, and pursuing outcomes that make sense.

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