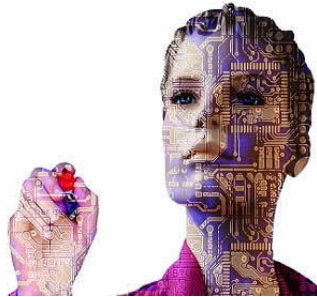# Artificial Intelligence Virtual Radiology Consultant

Using cutting-edge artificial intelligence, researchers at UCLA have developed a machine learning application that acts like a virtual assistant to help guide patients' interventional radiology care, according to research presented at the Society of Interventional Radiology's 2017 Annual Scientific Meeting.

The new tool (a "chatbot" interventional radiologist) can automatically communicate with referring clinicians and quickly provide evidence-based answers to frequently asked questions. This allows the referring physician to provide real-time information to the patient about the next phase of treatment, or basic information about an interventional radiology treatment.

In this UCLA study, deep learning was used to understand a wide range of clinical questions and respond appropriately in a conversational manner similar to text messaging. Deep learning is a technology inspired by the workings of the human brain, where networks of artificial neurons analyse large datasets to automatically discover patterns and "learn" without human intervention. Deep learning networks can analyse complex datasets and provide rich insights in areas such as early detection, treatment planning, and disease monitoring.

The research team enabled the application, which resembles online customer service chats, to develop a foundation of knowledge by feeding it more than 2,000 example data points simulating common enquiries interventional radiologists receive during a consultation. Through this type of learning, the application can instantly provide the best answer to the referring clinician's question. The responses can include information in various forms, including websites, infographics, and custom programs. If the tool determines that an answer requires a human response, the program provides the contact information for a human interventional radiologist. As clinicians use the application, it learns from each scenario and progressively becomes smarter and more powerful.

"This research will benefit many groups within the hospital setting. Patient care team members get faster, more convenient access to evidence-based information; interventional radiologists spend less time on the phone and more time caring for their patients; and, most importantly, patients have better-informed providers able to deliver higher-quality care," explains co-author Kevin Seals, MD, resident physician in radiology at UCLA and the programmer of the application.

The researchers used a technology called Natural Language Processing, implemented using IBM's Watson artificial intelligence computer, which can answer questions posed in natural language and perform other machine learning functions. This prototype is currently being tested by a small team of hospitalists, radiation oncologists and interventional radiologists at UCLA.

Source: Society of Interventional Radiology

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