Watson Health

Executive Brief

The promise and potential of AI in imaging

In 2013, a researcher at Harvard Medical School conducted an experiment designed to test the theory of “inattentional blindness.” This occurs when people fail to see an object that is in plain sight because they are focused on looking for something else.

Inspired by a famous study in which observers who were concentrating on a ball game failed to see someone in a gorilla suit walk through the scene, researchers superimposed a matchbook-sized picture of a man in a gorilla suit onto a series of lung images. They then asked radiologists to examine the images as they would for a typical imaging study. Although the radiologists did well at finding lung nodules in the images, 83 percent of the radiologists did not see the gorilla.

Because missed findings can lead to negative health outcomes, the ability of AI to catch an abnormality that a practitioner may have missed makes it very valuable in healthcare.

AI is ideally suited to meet healthcare challenges

The experiment is a prime example of the power of humans to focus so intently on a specific task — in this case looking for lung nodules — that all other potential observations become filtered and shaped by that focus. It's also a compelling argument for the potential of artificial intelligence (AI) in imaging. AI systems have no preconceived assumptions about expected findings that could blind them to unexpected results. Because missed findings can lead to negative health outcomes, the ability of AI to catch an abnormality that a practitioner may have missed makes it very valuable in healthcare.

In addition to compensating for humans' inattentional blindness, AI has other important strengths that make it a good fit for the challenges of healthcare:

AI can handle overwhelming health data
Because of an explosion of health information in the form of patient records and images, breakthroughs in genomics, population health data and a steady stream of new studies and journal articles, healthcare providers are drowning in data. But deep learning AI systems thrive on data — the more they're given, the better they perform.

AI can work within existing systems and workflows
A well-designed AI solution not only is compatible with existing infrastructure and workflows — causing a minimal need for extra resources or disruption — but can help organizations utilize their existing systems more effectively. For example, an AI solution that can search for relevant patient information in the unstructured data of the EHR, such as IBM Watson Imaging Patient Synopsis, actually increases the value of the EHR.

What the future holds for AI in imaging

The near-term potential of AI is to build a safety net that lets us identify the high-value signals that might otherwise be missed. Longer term, the technology has the potential to revolutionize precision medicine and improve patient care. Make no mistake, a lot still needs to happen before that long-term promise is fulfilled. But many of the critical building blocks are already in place today.

For example, right now we are able to use natural language processing technology to review clinical text from EHRs and identify relevant unstructured data, turning it into actionable patient insights. This allows us to highlight potential discrepancies in documentation and also provide valuable clinical context to physicians during image interpretation.

The next step is to apply the analytic power of AI to sources of data beyond the EHR, including images. Watson Health is focused on further expanding the physician's view by developing solutions that can provide valuable insights at other points in the care continuum, for example by retrospectively identifying high impact, potential missed findings in radiology imaging studies.

With the capability to ingest large amounts of data, "see" hidden findings and fit into existing workflows, AI has great potential to help healthcare organizations achieve their central aim: improving quality of care. By carefully nurturing this technology, partnering with healthcare providers around the world to train and test it, and aiming for consistent improvements in workflow processes, we are putting the pieces in place that will enable a real, sustainable revolution in healthcare.

To see how Watson Health Imaging is using AI to drive impact today and prepare for the future, visit our web page.

About Watson Health Imaging

Watson Health Imaging, a segment of IBM Watson Health, is a leading provider of innovative artificial intelligence, enterprise imaging and interoperability solutions that seek to advance healthcare. Its Merge branded enterprise imaging solutions facilitate the management, sharing and storage of billions of patient medical images.

With solutions that have been used by providers for more than 25 years, Watson Health Imaging is helping to reduce costs, improve efficiencies and enhance the quality of healthcare worldwide.

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