Interview series

Using AI to help radiologists estimate the volume of blood clots in the brain

Based in Marlborough, MA, Quantiphi is an award-winning Applied AI and data science software and services company driven by the desire to solve transformational problems at the heart of business. It was named Google Cloud's Global Social Impact Partner of the Year for 2019 and Machine Learning Partner of the Year for 2017 and 2018.

The Google Cloud Healthcare and Life Sciences team spoke with Asif Hasan, Co-Founder of Quantiphi, about the groundbreaking advances Quantiphi is making in partnership with Johns Hopkins University and Google Cloud, in blood clot assessment and hemorrhage detection.

Your company has grown twelve-fold in the past four years. It's an amazing moment for artificial intelligence, isn't it?

Asif Hasan: Yes. Quantiphi is a team of about a thousand applied AI, machine learning, and data science professionals. Historically, the application of AI and data in healthcare has been fairly limited. With recent technological advancements in the deep learning domain, however, new categories of information qualify as data and are available for application in the AI space—for example, DICOM images produced by radiology equipment, digital pathology, and genomic sequences. We've grown from a team of 80 people to 1,000-plus as a result of focusing heavily on AI and data, which are transforming the world today.

Let's get solving.

Johns Hopkins University, Quantiphi, and Google Cloud are...

"...solving for faster, more accurate detection of brain hemorrhage to improve patients' chances of full recovery and high quality of life."

**Asif Hasan,
Co-Founder, Quantiphi**

What made you decide to partner with Google Cloud?

Asif Hasan: Google Brain did an experiment where they took 10 million images, randomly sampled from YouTube, and ran a technique called auto encoders to detect the content of the images. And they found something quite unexpected: one class of objects was occurring way too frequently—cats.

In retrospect it makes sense, since cats are all over the Internet. But the experiment showed that you can use deep learning techniques to solve historically unsolved problems in computing. I looked at that headline and became convinced that applying deep learning to unsolved business problems can be a transformative idea.

In January 2016, we activated a partnership with Google Cloud. I believe that if Google hadn't invested in AI when they did (with their auto encoder experiment), it would still be an academic research domain, rather than a practical set of tools that is useful for businesses. Google's work in general, and Google Cloud in particular, is truly an acceleration. That's why we chose to be a Google Cloud partner, and I think we made the right call.

Can you tell us about the exciting work you're doing with Johns Hopkins?

Asif Hasan: We started working with the Brain Injury Outcomes Institute at Johns Hopkins University on the problem of intracranial brain hemorrhage in 2018. When a brain hemorrhage occurs, it is very important to estimate the volume of blood clots in the brain with high accuracy to determine treatment protocols and the likelihood of full recovery. So it's a very important problem.

Asif Hasan,
Co-Founder,
Quantiphi

"I believe that if Google hadn't invested in AI when they did, it would still be an academic domain, rather than a practical domain that is useful for businesses. Google's work in general, and Google Cloud in particular, is truly an acceleration."

Today, the algorithm used to make these estimates assumes that blood clots are elliptical. This may or may not be a fair assumption, which means the resulting estimate may be incorrect. We hypothesized that with advances in computer vision, we would be able to estimate blood clot volumes as accurately as radiologists.

Was your hypothesis correct?

Asif Hasan: Yes, our hypothesis was largely proven correct. This solution, which is going into trials, looks at large volumes of 3D computerized tomography (CT) scans and accurately assesses the volume of a blood clot. And this happens in seconds instead of taking hours waiting in que for an expert radiologist's time. We will be publishing these results in academic journals and confirming them in trials.

What was it like to work with the teams at Johns Hopkins and Google Cloud?

Asif Hasan: Dr. Daniel Hanley and the rest of the Johns Hopkins team are world renowned experts and researchers. It's helpful to work with a team that understands and appreciates both the clinical and the technological aspects of the problem, and has the desire to take on such unsolved problems. With Quantiphi's technology building blocks and the team at Google Cloud, we formed a complete trifecta.

What have you found most rewarding about this collaboration?

Asif Hasan: I truly believe that the team at Google Cloud is focused on identifying and addressing some of the toughest challenges in healthcare and life sciences. We are having a lot of fun and exciting times working with Google Cloud and Johns Hopkins to bring differentiated healthcare solutions across the domains of providers, payers, pharma, life sciences, genomics, and medical devices. We are very optimistic about how these technologies will transform healthcare, improve patients' lives, and improve clinical workflows. We're solving problems that matter.

Asif Hasan,
Co-Founder,
Quantiphi

"Our solution, which is going into trials, looks at large volumes of 3D CT scans and accurately assesses the volume of a blood clot. And this happens in seconds, instead of taking hours waiting in queue for an expert radiologist's time."

To learn more about
Google Cloud Healthcare and Life Sciences visit:

https://cloud.google.com/solutions/healthcare-life-sciences

To learn more about Quantiphi visit:
https://www.quantiphi.com