Meet Siemens Healthineers

Siemens Healthineers: Our brand name embodies the pioneering spirit and engineering expertise that is unique in the healthcare industry. The people working for Siemens Healthineers are totally committed to the company they work for, and are passionate about their technology. In this section we introduce you to colleagues from all over the world – people who put their hearts into what they do.

Dongyeob Han, Ph.D.

Dongyeob Han was born in Seoul, Republic of Korea. In 2005, he began his bachelor's degree at Yonsei University in the Department of Electrical and Electronics Engineering. In his senior year, he began an internship in Professor Dong-Hyun Kim's Medical Imaging Laboratory. Dongyeob began his master's program in 2012 and completed his doctorate in February 2020 at the same university and lab.

Throughout his graduate studies, Dongyeob was actively immersed in research, attending ISMRM nearly every year, receiving both the Summa Cum Laude and Magna Cum Laude awards, and giving poster presentations on numerous occasions. During his Ph.D., he began researching MR fingerprinting (MRF) and developed a high-resolution 3D MRF pulse sequence.

Dongyeob is currently working at Eunpyeong St. Mary's Hospital as an onsite MR scientist, and is collaborating with physicians on various research initiatives, including MRF.

How did you first come into contact with MRI?
There were two memorable occasions: One was my first encounter with *k*-space. It was a project on advanced image processing during the first semester of my senior year of university. My first impression of *k*-space was that it was like a constellation, and I had no idea how it stored image data. After performing Fourier transform, MR images suddenly appeared, which astonished me. This was my first encounter with MRI data, and it led me to enroll in a graduate lab dealing with MRI physics.

The second occasion occurred in graduate school. I will never forget successfully reconstructing an MR image on the scanner (it was a 3T MAGNETOM Trio) with my first pulse sequence modification. In the gradient echo sequence, I added a simple gradient along the slice direction (also known as the *z*-shim gradient). At that moment, I was so thrilled that the reconstructed MR image matched my expectations precisely. It was amazing to see my theoretical ideas transformed into the actual world with a few codes and a very complex machine.

What do you find motivating about your job?
I enjoy my job for numerous reasons. The first is unquestionably down to MRI itself. Even though more than ten years have passed since I first encountered MRI, I am still fascinated by its fundamentals, such as magnetization, resonance, and imaging! Occasionally, while operating an MRI scanner, I listen to it carefully and imagine (please don't laugh) what happens to the protons in the human body. I find it endlessly exciting.

I typically work with physicians at the university hospital, with colleagues at headquarters, and with my research team in Korea. All of these people constantly inspire me. For instance, physicians inform me of the clinical significance and their experience of our new techniques. This helps me understand the Korean medical environment, what physicians require, and how we can proceed with our study. And with my colleagues at headquarters and in Korea, we discuss the techniques in depth and exchange ideas. This has most definitely given me a lot of inspiration.
Since I am an onsite scientist at a hospital, I have frequent opportunities to observe patients and some find it difficult to obtain MR images. In the end, with everyone's effort, I do believe that our investigations will ultimately help the patients. This faith inspires me to continue my work.

What are the biggest challenges in your job?
During my research collaborations, I've encountered a variety of obstacles, including most recently the restriction of data sharing as a result of the growth of AI research. Generally, it's difficult to maintain a balance between clinical protocol acquisition and research protocol

acquisition. Since Korea has national health insurance, university hospitals and MRI examinations are readily accessible to Korean patients. Therefore, MRI scans are limited in time (around 30 minutes to 1 hour) and it is difficult to add additional scans for research purposes.

What are the most important developments in healthcare?

So many aspects of MRI advances require our attention. However, if I had to choose one, I would prioritize the motion-related solution. Obviously, motion issues can be resolved in a number of ways, including rapid imaging with deep learning-based parallel imaging, prospective/retrospective motion correction, and improving patient comfort.

Throughout my Ph.D. at engineering school, I placed a strong emphasis on learning and developing cutting-edge techniques. These techniques were typically tested on healthy volunteers to determine their efficacy. Since joining Siemens Healthineers, I have worked as an onsite scientist in a hospital, so I have had numerous opportunities to observe MR imaging with patients in a clinical setting. I've observed that the image quality degrades as a result of motion when applying recent innovative techniques that produce beautiful images of healthy volunteers. In addition, patients who are seriously ill are occasionally unable to obtain MRI scans due to motion. I find this upsetting, and it compels me to help solve the issue as soon as possible.

What would you do if you could spend a month doing whatever you wanted?

A number of thoughts are surfacing in my mind in response to this: I'd like to spend some time on an island with a stunning shoreline – Bali, perhaps, or Hawaii, where I can learn to surf, run along the coast, and watch the sunset from the beach. It would surely rejuvenate and revitalize my mind.

In addition, if I had enough time, I'd like to build an MRI scanner so I could learn how to construct and connect each component – the magnet, gradient coil, RF amplifier, receiver coils, controller computer, everything – on my own. When I envision receiving my first image from that DIY system, it feels extraordinary.

Get to know us

Find more portraits of our colleagues around the world!

www.magnetomworld.siemens-healthineers.com/meet-siemens-healthineers