

Meet Siemens Healthineers

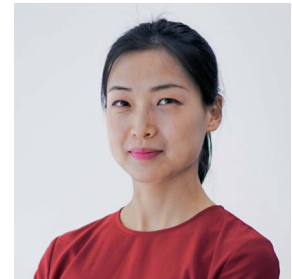
Siemens Healthineers: Our brand name embodies the pioneering spirit and engineering expertise that is unique in the healthcare industry. The people working for Siemens Healthineers are totally committed to the company they work for, and are passionate about their technology. In this section we introduce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

Cheng Shi, Ph.D.

I have a bachelor's degree in biomedical engineering from Tsinghua University. I earned my Ph.D. working under Professor Ed X Wu in the Laboratory of Biomedical Imaging and Signal Processing at the University of Hong Kong. After graduating, I joined SSMR in 2015 as a protocol developer.



Shenzhen, China



How did you first come into contact with MRI?

I majored in biomedical engineering, so I learned a bit about MRI, CT, and PET in an introductory course on medical imaging techniques in my sophomore year in 2007. I was intrigued by MRI's lack of radiation, multi-functionality, and most of all the anatomical details it provides. But it was not until my third year, when I chose a course on MRI basics, that I really began to understand the terms "T1-weighted", "T2-weighted", and "k-space". I've been fascinated ever since. The first MRI system that I worked on was a Bruker 7T small animal scanner during my doctoral studies on subcortical visual function in rats. When I learned that Siemens Healthineers had developed an ultra-high 7T system for human studies, I was really impressed. But I wasn't surprised – I figured that if any company was going to do that, it would be Siemens Healthineers. Now that I'm part of Siemens Healthineers, I'm working to inspire the same confidence in other people. I hope that when our 0.55T MAGNETOM Free.Max hits the wider market, people also won't be surprised.

What do you find motivating about your job?

The opportunities for self-improvement motivate me. As a protocol developer, I set up and test the protocols and workflows. Over the past five years, I've integrated many large and small application features to make the protocols faster and the workflow smarter. For example, one of the biggest challenges with MAGNETOM Free.Max is the lower SNR concomitant with lower field strength of 0.55T. A novel SMS averaging technique was developed by Dr. Liu Wei to improve SNR by taking advantage of

both the conventional SMS technique and the fact that MAGNETOM Free.Max requires multiple averages. While it is understood how this technique should help, it is up to me as a protocol developer to identify the best application scenarios – such as body regions, contrasts, and coil settings – and the optimal parameter settings to push its limits. I love the fact that we strive to improve for the benefit of our customers and ourselves, and for each and every product we develop.

What are the biggest challenges in your job?

The biggest challenge is how to respond to MAGNETOM users' needs in the best possible way. Also, MAGNETOM Free.Max presented many challenges linked to the lower field strength. One of the main challenges I encountered was the SWI application. Ever since it was first published, SWI has been widely used for the detection of microbleeds and calcification. The longer echo time needed for the susceptibility effect proportional with field strength caused a further drop in SNR. I spent quite some time working on it until I had to conclude that optimizing the old GRE-based SWI was a dead end. But I didn't want to just give up on such an useful application. Supported by the whole application team and especially by Dr. Liu Wei, we developed an SWI sequence based on a partially flow-compensated 3D EPI sequence. Using the 3D technique greatly improved the SNR. Though it was not without its flaws, repeated volunteer testing in the factory and working on feedback from clinical sites led to the EPI-based SWI finally being provided. In the end, we have done our best to serve the users' needs by enabling SWI for MAGNETOM Free.Max.

What are the most important developments in healthcare?

Medical imaging is one of the top ten medical advances and it has transformed healthcare. With MAGNETOM Free.Max, we have worked hard to make this revolutionary modality accessible to more people. With a lower field strength it is easy to install and promotes MR applications that profit from reduced susceptibility artifacts such as imaging in the presence of metal or lung imaging. Moreover, the new platform will further revolutionize healthcare by helping to network data and enable AI training based on big data.

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

If I had a whole month, my first choice would be a meditation retreat. Ever since I read about it in a novel (can anyone guess what it is?), I've wanted to experience it for myself. I'd enjoy having the time to really focus on myself, on my breathing, and on observing myself without judgement. My second choice would be to take a trip with my children. Ideally, we'd all go to India for a meditation retreat together when they are old enough. Before that, I might choose to work for the month because the company gives me the flexibility to go home early (since I go to work early) and spend time with my kids. Also, I take part in the dance and yoga classes that are held in the company's gym with other kindred spirits every lunchtime. It's a very enjoyable daily routine. And by the way – the novel that inspired me to visit a meditation retreat is *Eat, Pray, Love* by Elizabeth Gilbert.

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