



In the pilot study, clinicians were able to manipulate the projected 3-D heart structures by literally touching the holographic volumes in front of them. (Photo: RealView)

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Researchers test live 3-D holographic imaging

The pilot study, initiated by Royal Philips and RealView Imaging, involved eight patients and was conducted in collaboration with Schneider Children's Medical Center of Israel in Petah Tikva in Israel. RealView's innovative visualisation technology was used to display interactive, real-time 3-D holographic images acquired by Philips' interventional X-ray and cardiac ultrasound systems.

In addition to viewing the patient's heart on a 2-D screen, doctors in the team were able to view detailed dynamic 3-D holographic images of the heart floating in free space during a minimally invasive structural heart disease procedure without using special eyewear. The doctors were also able to manipulate the projected 3-D heart structures by literally touching the holographic volumes in front of them. The study demonstrated the potential of the technology to enhance context and guidance during structural heart repairs.

"The holographic projections enabled me to intuitively understand and interrogate the 3-D spatial anatomy of the patient's heart, as well as to navigate and appreciate the device-tissue interaction during the procedure," said Dr Einat Birk, paediatric cardiologist and Director of the Institute of Pediatric Cardiology at Schneider Children's Medical Center.

Dr Elchanan Bruckheimer, paediatric cardiologist and Director of the Cardiac Catheterisation Laboratories at the centre, added: "The ability to reach into the image and apply markings on the soft tissue anatomy in the X-ray and 3-D ultrasound images would be extremely useful for guidance of these complex procedures."

"Our ultimate goal is to create the future of health care by delivering innovative solutions that enhance clinical capabilities and improve patient outcomes," said Bert van Meurs, General Manager of Integrated Clinical Solutions and Marketing for Imaging Systems at Philips Healthcare. "By teaming up with partners that share our passion for innovation, we have been able to demonstrate the feasibility and potential value of the world's first holographic visualisation technology targeted at guiding minimally invasive cardiac procedures."

"I see clear indications that 3-D medical holography will play an important role in medical imaging in the near future," said Aviad Kaufman, CEO of RealView Imaging. "With the advancement of live 3-D imaging and increasing clinical evidence of its value for a variety of procedures, we are convinced that our holographic technology will further enhance 3-D imaging and, most importantly, improve patient care."

Progress in image-guided therapies for heart disease, such as the opening of obstructed coronary arteries, catheter ablation therapy for heart arrhythmias and catheter-based structural heart repairs (e.g. heart valve replacements), have greatly increased the need for live 3-D image guidance to supplement today's live 2-D image guidance. Live X-ray imaging and live 3-D cardiac ultrasound imaging are typically used simultaneously to guide minimally invasive structural heart repair procedures, with the ultrasound images providing detailed views of the heart's soft-tissue anatomy, and the X-ray imaging providing visualisation of catheters and heart implants.

The technological advancements in the acquisition of live 3-D images to guide minimally invasive procedures have triggered the development of novel ways to visualise the data. Based on the promising results of this pilot study, Philips and RealView Imaging will continue to explore the clinical value of combining live 3-D imaging and medical holography, both in interventional cardiology and in other clinical areas.



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