

Cinematic Rendering for Surgery will make the task of planning operations more efficient and more accurate

- **Evaluation study at the Erlangen University Hospital, Department of Surgery**
- **Clear presentation of the relative position of tumor tissue and blood vessels can help surgeons select the best operating strategy**

Cinematic Rendering, a new type of 3D visualization from Siemens Healthineers, shows clinical images of the human body in previously unknown, realistic photo quality. The hyper-realistic method of display not only makes it easier to communicate with patients and referring physicians, but also to train new medical practitioners. One of the first applications in a hospital environment is being trialed as a prototype in an evaluation study at the Department of Surgery at the Erlangen University Hospital: "Cinematic Rendering for Surgery"¹ is intended to help surgeons choose the best operating strategy by clearly presenting the relative position of tumor tissue and blood vessels prior to operating. The study will include an evaluation of the extent to which the use of Cinematic Rendering images, instead of the customary 2D DICOM data, will enable surgeons and oncologists to make decisions both faster and more reliably. Surgery is one of the strategic growth areas for Siemens Healthineers.

For tumor operations in particular, the way blood vessels lie is an important indicator underlying the choice of the most suitable individual operating strategy. Previously, surgeons have had to rely on feeling and palpating the blood vessel branches during surgery, in addition to preparatory study of 2D data from prior CT or MRI examinations, to be able to decide on the best approach for each individual patient. Before the new Cinematic Rendering application was developed, Siemens Healthineers was constantly alerted to the desire for a specialized visualization method during talks with tumor boards and consulting committees in Germany and the USA. From the surgeons' perspective, an

excellent 3D representation would be a key advantage in planning surgical treatment. This would make it possible to better understand relative positions of organs, tumor tissue and the surrounding vessels, or the vessels supplying the tumor prior to surgery, and ensure that the blood supply through the correct branch of the vessel was blocked off.

Relative positions clear at a glance

Prof. Robert Grützmann, Director of Surgery at the Erlangen University Hospital, where the prototype is being evaluated, also identifies further benefits that are being discovered in the process of working with Cinematic Rendering for Surgery. For example, he can foresee a democratization of the tumor board, in which physicians with differing specializations decide on each patient and the individual treatment approach to be adopted based on CT and MRI images. “Thanks to the true-to-life Cinematic Rendering images, all our colleagues can grasp a given case at a glance,” Grützmann reports. “The result is potentially faster, more objective and more reliable interdisciplinary treatment decisions, and more effective surgical planning.”

At the surgeons’ request, the user interface on the prototype has been kept highly intuitive and easy to follow. “The application can be used faster and more easily as a result, which is a quite essential criterion for us in our clinical work,” emphasizes Dr. Christian Krautz, who is heading the evaluation at the Surgical Hospital of Erlangen University Hospital. As part of the evaluation study, Krautz and his colleagues use oncological cases to determine how much faster they can decide on the best operating strategy using Cinematic Rendering for Surgery compared to planning using traditional CT images.

Some of the main elements of the prototype are the surgery-specific tools, such as the sliding, selective sectional plane, which makes it possible to remove tissue virtually, showing the vessels in front of the sectional plane in order to more easily determine their position relative to the tumor. In addition to the large Cinematic Rendering image, the original CT or MRI sectional image is also displayed in a smaller format, to ensure the user always has access to the familiar sectional image view. Of equal importance to the surgeons was the realistic photo-quality presentation using Cinematic Rendering, which shows bones as white and tissue as red, for example. Organs can also be shown transparently, to enable the shape and position of a liver tumor, for example, to be shown clearly along with the

vessels supplying it, while the liver itself appears essentially transparent. The surgeons can also place bookmarks to enable them to return easily to relevant views. In the case of pancreatic tumors, in turn, a type of hybrid view is helpful, in which the Cinematic Rendering presentation of the vessels is overlaid on the traditional DICOM image of the tumor.

Besides planning the operation itself, Cinematic Rendering for surgery also potentially offers benefits for training new medical practitioners, and also for providing explanatory detail to the patients. This easy-to-follow visualization could help make it easier for them to understand any potential risks and the planned course of the surgery they will undergo.

¹ The product is still under development and not commercially available yet. Its future availability cannot be ensured.

The concepts and information presented in this paper are based on research and are not commercially available.

The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

Further information and pictures are available at www.siemens.com/press/cinematic-rendering.

Contact for journalists

Ulrich Kuenzel

Phone: +49 9131 84-3473; E-mail: Ulrich.Kuenzel@siemens-healthineers.com

Siemens Healthineers is the separately managed healthcare business of Siemens AG enabling healthcare providers worldwide to meet their current challenges and to excel in their respective environments. A leader in medical technology, Siemens Healthineers is constantly innovating its portfolio of products and services in its core areas of diagnostic and therapeutic imaging and in laboratory diagnostics and molecular medicine. Siemens Healthineers is also actively developing its digital health services and enterprise services. To help customers succeed in today's dynamic healthcare marketplace, Siemens Healthineers is championing new business models that maximize opportunity and minimize risk for healthcare providers. In fiscal 2016, which ended on September 30, 2016, Siemens Healthineers generated revenue of €13.5 billion and net income of over €2.3 billion and has about 46,000 employees worldwide. Further information is available at www.siemens.com/healthineers.