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Patent Information

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Publication(s)

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External Link(s)

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Providing surface contrast in rendering of three-dimensional images for micro-surgical applications

Value Proposition

Recent advancements in optical coherence tomography (OCT) technology have greatly improved image quality and have facilitated the acquisition, processing, and display of three-dimensional information in real-time. As a result, this technology can now be readily applied for guidance and feedback in intraoperative setting and is being adopted rapidly in the fields of ophthalmology, neurosurgery, and otolaryngology. However, rendering volumetric data in an intuitive manner and combining it with the visual representation of the surgical field has proven to be a challenge – the current standard of using grey-scale pixel mapping yields poor contrast between targets of surgical interest and fails to provide sufficient information about the depth of tissue structures.

Technology

The proposed technology takes advantage of color gradients to encode additional information into three-dimensional rendering of OCT data. Color-gradients can be used in a variety of ways to indicate axial depth, to highlight specific tissue features, or even provide functional information about the surgical field. The ability to track complex structures in a surgical environment as they deform will improve surgical precision and aid in preventing inadvertent damage to surrounding tissue. The ability to enhance 3D visualization in this domain as well as provide novel information to surgeons in real-time has tremendous potential to impact surgical decision-making and improve the accuracy of micro-surgical procedures.

Application

Real time visualization of 3D data.

Advantages

- Improved resolution of complex surfaces rendered in 3D
- Can be applied in real time
- Stabilized for intrasurgical motion
- Can be broadly applied to existing technology (e.g., intraoperative OCT) or across other imaging modalities.

