

Virtual Surgical Simulation and Atlas-Based Segmentation of Temporal Bone Anatomy



Abstract: Surgical approaches, such as mastoidectomy and cochlear implantation, are the primary treatment for a wide range of hearing and balance disorders. Our group has developed a surgical simulator that includes volume visualization, haptic modeling and psychometrics to help train clinicians complex temporal bone surgical techniques. Clinically acquired X-ray computed tomography (CT) images are used in the surgical simulator. Manual segmentation of critical anatomical structures required for pre-surgical planning is laborious and requires an expert reviewer. Therefore, we have implemented and validated an atlas-based approach to automatically segment 20 critical anatomical structures within the temporal bone in near real-time. Accurate automated segmentation of temporal bone anatomy allows us to further develop the training simulator for use in pre-surgical planning of cochlear implants surgery and post cochlear implant evaluation.

About the Speakers: Dr. Powell completed her Ph.D at the Ohio State University in 1992. She worked at the Cleveland Clinic for 13 years where she developed an automated image processing approach for stem cell cultures and built a microCT imaging system for small animal imaging. She then spent 3 years in Contract Research Organizations performing quantitative imaging for the pharmaceutical industry. She is currently a clinical research professor in the Department of Biomedical Informatics at OSU and the director of Small Animal Imaging for the University. Dr. Powell is an imaging scientist who has extensive research experience in microscopy, small animal, and clinical imaging and image analysis. She has published more than 60 papers in reputed journals.

Kimerly Powell, PhD
Friday, January 31st, 11:00am-12:00pm
L045 James