

## 15072 - GTx-EYES

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### Technology description

#### A Software Platform for Multi-Modality Image Guidance

Surgeons, scientists, and engineers in the Guided Therapeutics (GTx) program at UHN have developed a custom 3D visualization and navigation platform for image-guided surgery, radiation therapy and interventional radiology. The platform provides navigation, tracking, image processing and registration of tools and images.

The software package provides registration and visualization of 3D imaging (e.g. CT, MRI, cone-beam CT, SPECT, PET), planning contours, real-time optical/electromagnetic tracking of interventional tools, and endoscopic video.

Fusion of 2D video with 3D volumetric data provides virtual endoscopy and augmented reality views of sub-surface anatomical structures (e.g., carotid arteries, optic nerves). Real-time tracking combined with virtual critical structure “no fly zones” enables visual/auditory proximity alerts to act as an early-warning system for complex interventional procedures.

This advanced image-guidance technology allows for precise intervention performance while minimizing complications. Clinician feedback and human factors research has been essential to optimizing the user display for safe and effective medical use. The modular software architecture promotes the rapid development of new clinical applications using a shared set of software components. The use of the system as a dynamic ‘surgical dashboard’ in the OR is being evaluated in two ongoing UHN clinical studies (head & neck oncology, minimally-invasive skull base surgery).

### Application area

Custom 3D visualization and navigation platform for image-guided surgery, radiation therapy and interventional radiology

### Institution

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