

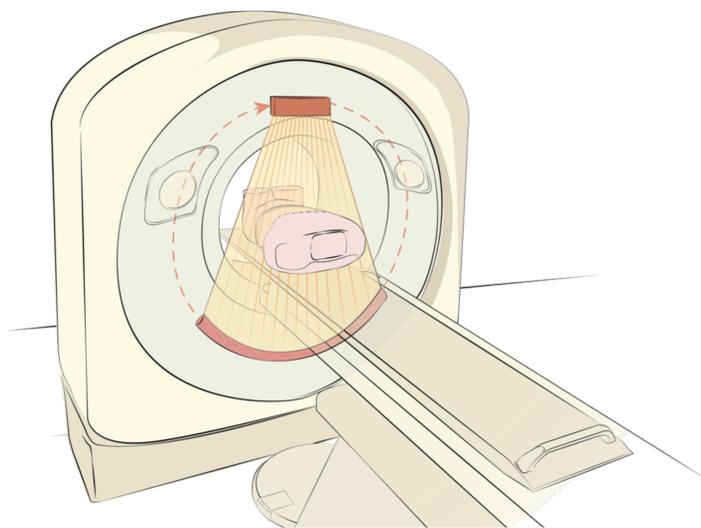
Computed Tomography Analysis for Ballistic Research Applications



S&T Campaign: Assessment & Analysis
Military Injury Biomechanics

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A CT scanner uses X-ray technology to non-destructively investigate objects.

Research Objective

- Use computed tomography (CT) scanning technology for nondestructive evaluation and analysis.
- Develop post-processing techniques to further V/L analysis.

Challenges

- Reducing metal streak artifacts in scans to obtain accurate reconstruction and measurements.
- Projects require manual segmentation and analysis of imaging, therefore the process is often tedious.

ARL Facilities and Capabilities Available to Support Collaborative Research

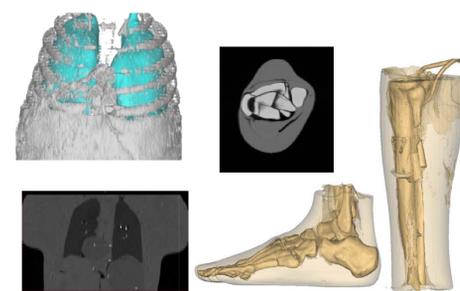
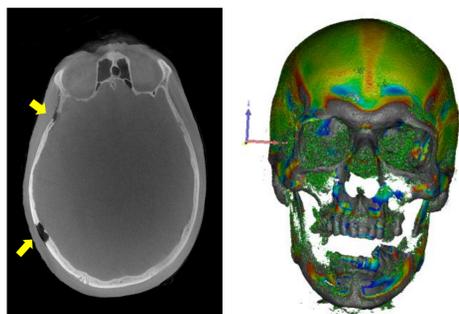
- A mobile GE BrightSpeed Elite Medical CT System.
- Biomedical analysis software providing diverse Digital Imaging and Communications in Medicine (DICOM) analysis techniques.
- Analysis of DICOM images from CT scanner provides 2-D measurements, 3-D volume rendering, volume measurements, and 3-D object reconstruction.
- 3-D geometry development for computational modeling.



The mobile trailer that houses the GE BrightSpeed Elite CT System is currently located at an ARL experimental facility at Aberdeen Proving Ground, MD.

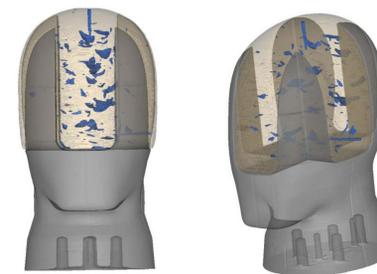
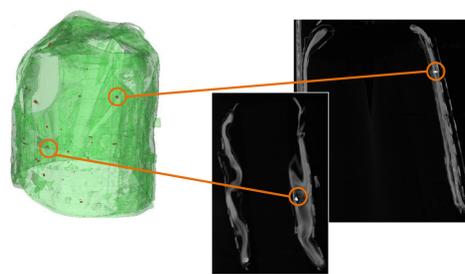
Military Relevant CT Applications:

Analyzing Biological Targets



Evaluating Blast Test Devices

Analyzing Armor Systems



Evaluating Ballistic Test Devices

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- Algorithms for automatic object/feature detection and analysis.
- Algorithm development for image segmentation and registration.
- Analysis of raw CT data.
- Metrology – dimensionality and statistical analysis of measurements.
- Material analysis of ballistic and blast damage.