



U.S. ARMY
RDECOM

Representing a Distribution of Human Anatomies
for Soldier Survivability



S&T Campaign: Assessment & Analysis
Military Injury Biomechanics

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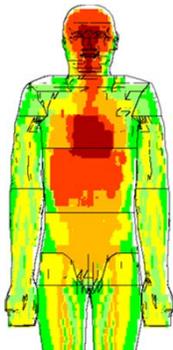
Research Objective

The wide variability in Soldier anthropometry has important ramifications for the effectiveness of materiel. To optimize Soldier survivability, system designers and acquisition decision makers require technical guidance and recommendations that address that widely varying population.

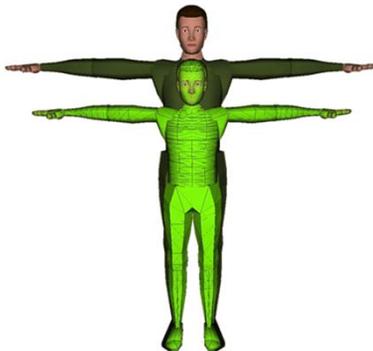
Challenges

- How can we make our anatomy models representative of the current Soldier population, male and female?
- How should we improve the anatomy models' resolution?
- How should we capture and represent varying postures?
- How can we make it easier to integrate these varying anatomies into models of vehicles and aircraft?

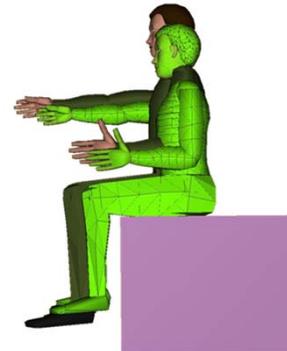
Differences may impact survivability and influence materiel developers



Predicted severity of injury



Small male Soldier (front) and
large male Soldier (rear)
comparison



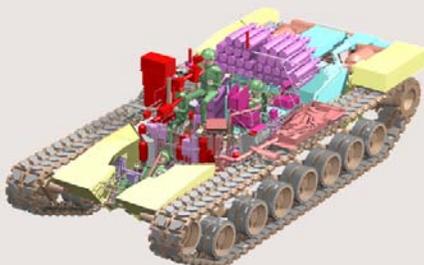
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ARL Facilities and Capabilities Available to Support Collaborative Research

- Ballistic and blast experimental facilities
- Digital image correlation cameras and software
- High speed video cameras
- Digital X-Ray timed to projectile flight
- Mobile CT scanner
- Material testing equipment

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

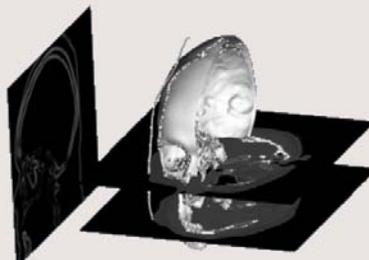
Enhance anatomical representation to better predict injuries



Example BRL-CAD model interior detail



Current anatomy with body armor



Medically valid data



Improved anatomical description