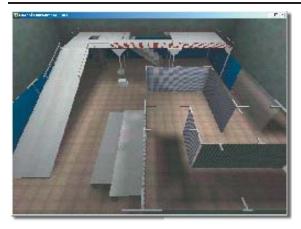# USAR
Urban Search and Rescue
Carnegie Mellon University

A Game Engine Based Simulation
of the NIST Urban Search and Rescue Arenas

:: Objective

To Develop interactive simulatoins of the National Institute of Standards and Technology (NIST) Reference Test Facility for Autonomous Mobile Robots (Urban Search and Rescue). The simulation is used to test and evaluate designs for teleoperation interfaces and robot sensing and cooperation which will subsequently be incorporated into experimental robots.

:: About the Simulation

The USAR simulator simulates the original NIST Orange Arena and was constructed directly from a CAD model of the arena. The simulator uses the Unreal engine on which Unreal Tournament and other video games are based to provide a high quality modeling environment that provides among other things:

- The best available graphics from game-oriented gpu's
- Client-server architecture supporting multiple robots
- Real-time rigid body dynamics using the Karma physics engine
- Skeletal modeling/animation to simplify model construction

:: The USAR Simulator

- Restricted field of view
- Unfamiliar viewing angles
- Noisy low bandwidth video
- Confusions about camera position

- Limited mobility
- Combine to make controlling a search and rescue robot very diffcult
- Simulators use exactly the same interface, video frame rate, and control architecture as the robot Corky
- The command grid control is the same one Corky uses
- The Joy Stick control lets you see how it would be to teleoperate Corky

Vicitm and fencing from real arena right with similar
scene from simulation left