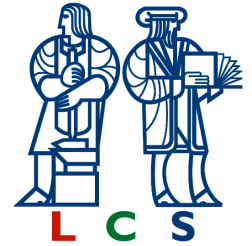


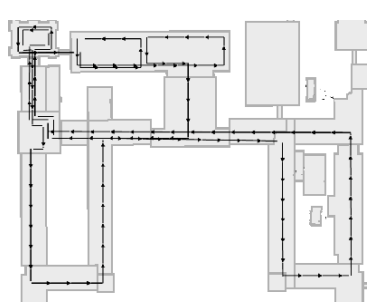
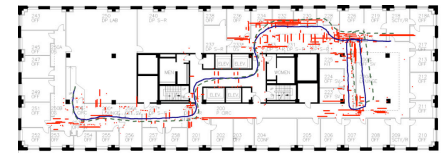
Goals: Support Direct Interaction with the Real World

- Develop rapid model capture capability using computer vision and legacy CAD data
- Develop pervasive location/orientation capability, indoors, without using GPS
- Combine to produce new devices and applications: software compass, marker, flashlight

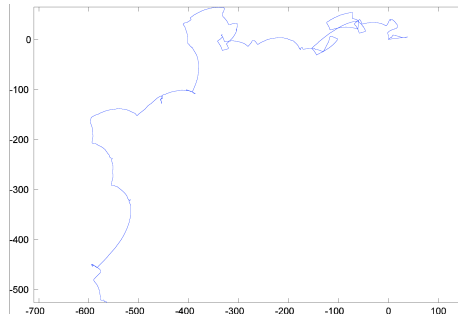


Recent progress (highlights)

- Egomotion recovery from laser ranging, omni-video over *large corridor networks with loops*
- Merging of MIT basemap, topographic map, and 800+ floorplans with spatial DB
- Prototype “software flashlight” with position, orientation, range, projector
- Initial API for location-aware network service (geometry, spaces, resources)



Robot path topology
(hand-drawn)

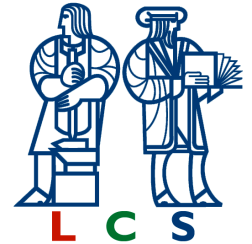


Raw odometry
(logged by robot)



Recovered robot
path, corrected





Research Plan for the Next Six Months

- Continue development of *Atlas Framework* for robotic acquisition of extended environments (1000's of meters)
- Merge location-aware API with efficient spatial DB of MIT basemap, 800+ floorplans, thousands of distinct spaces
- Achieve procedural population of transition regions: doors, elevators, stairwells, wheelchair ramps, pedestrian bridges
- Continue development of “software compass, marker, and flashlight”: position, orientation, range, VGA projection
- Deploy prototype “software marker” for rapid population of resources into functional environment representation