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  Building 3d models of unusual environments

  The ability to construct 3d models of large-scale environments is an enabling technology. Starting with the need to be able to construct environmental 3d models for the AQUA project -- a project that has developed a six legged amphibious robot -- we look at the computational problems that must be addressed in order to capture, model and manipulate large-scale environmental models from stereo sensors. Beginning with stereo camera image streams we follow the process of integrating stereo measurements over time to construct raw 3d models. These models are then integrated into more manageable surface representations of visible structure in the environment, and then finally segmented into semantic features. Ongoing research is exploring the use of the resulting models to assist in the investigation of crime scenes involving Chemical, Biological, Radiological, Nuclear or Explosive agents for which traditional crime scene techniques may be impractical.

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