

Freehand acquisition of unstructured scenes

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Modeling unstructured scenes which contain many small surfaces (such as leafy plants, coats, messy bookshelves or desks) is a challenging problem. A detailed model of an unstructured scene (either created manually or acquired automatically) will have substantial complexity. Such models require either an intense modeling effort or expensive equipment for acquisition.

Our approach is to use the ModelCamera to interactively acquire approximate unstructured scene models. The device is moved around the scene of interest and acquires frames enhanced with 45 depth samples. Registration is provided by a mechanical tracking arm the ModelCamera is attached to. The frames and depth samples are then merged into a model of the scene. The operator interactively guides the acquisition process, observing the evolving model and concentrating on areas of high geometric complexity.

The acquired model is rendered by creating an approximate mesh for each desired view. The approximate mesh is created by splatting the acquired points on the desired view for assessing visibility and then triangulating in 2D the pixels covered by splats. The acquired color frames are then used to color the mesh by projective texture mapping.