

Supplemental Document: DirectCam

Noah Lockwood, Patricio Simari, Patrick Coleman, and Karan Singh
University of Toronto



Figure 1: The DirectCam system in use. Hand motion is tracked using reflective markers on gloves and a Vicon optical motion tracking system. This provides the interface to scene editing appropriate for a large display of the scene.

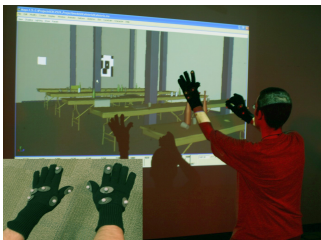


Figure 2: A user demonstrates the hierarchy construction gesture. The marker configuration on the gloves is illustrated in the inset.

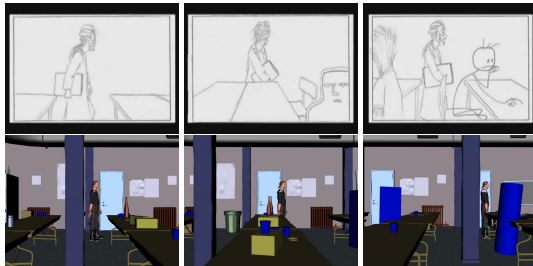


Figure 3: To test the system, we re-created an animatic for one scene in the animated short film Ryan (National Film Board of Canada, 2005) using the available sets, props, and characters. The original story reel is at the top and the re-created animatic is below.

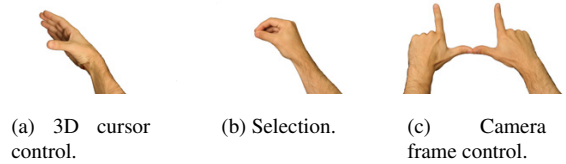


Figure 4: DirectCam uses a set of hand postures to invoke corresponding manipulation contexts. The primary interaction contexts are cursor control, selection, and camera navigation.

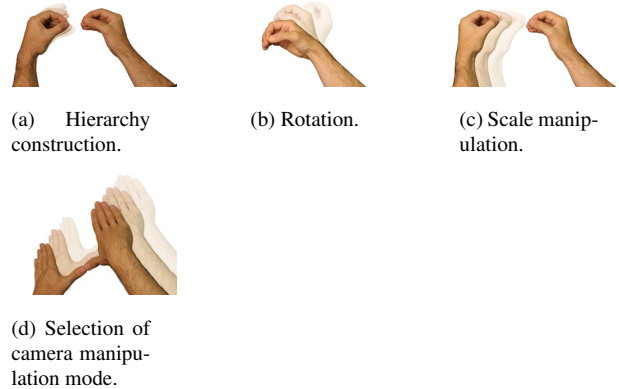


Figure 5: The gestural motion associated with different contexts directly maps to various interactive scene edits. Some invoke discreet operations, such as hierarchy construction (a, d), while others continuously manipulate object parameters (b, c).

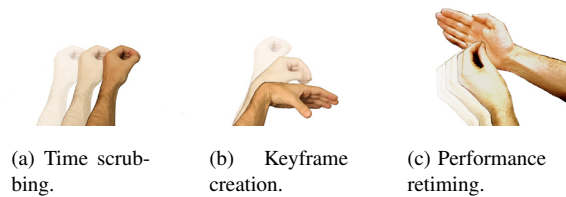


Figure 6: Additional gestures control animation tasks such as temporal navigation, the creation of keyframes, and motion retiming.

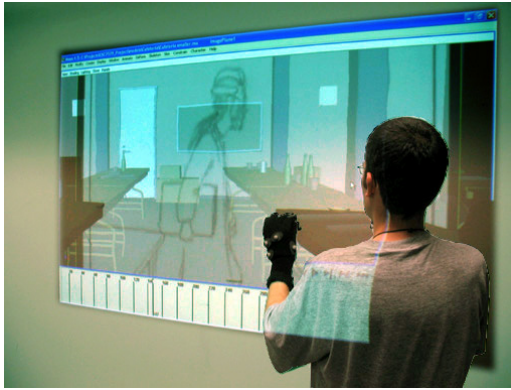


Figure 7: To create an animatic with DirecCam, a user first brings in a story reel for reference and then loads the 3D set intended for the scene.

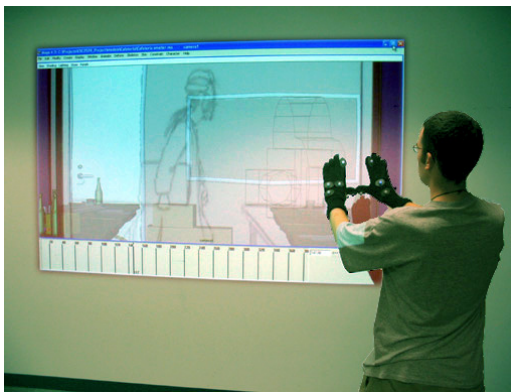


Figure 8: Users block in camera motion with a combination of through-the-lens navigation gestures (shown here), and third-person gestures for manipulation.

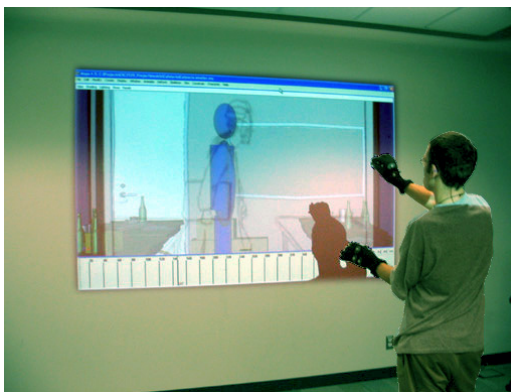


Figure 9: Character and prop models can be loaded from libraries available on shelves, or these can be constructed as needed as hierarchies of primitive shapes.

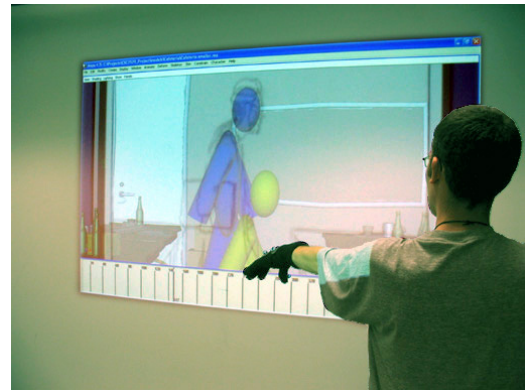


Figure 10: Layout-quality animation is applied by applying a drop gesture that copies a posed copy of the character or prop (yellow) onto the timeline.

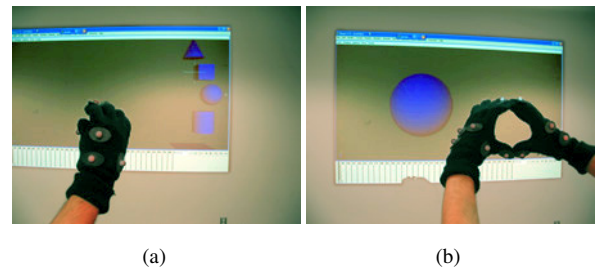


Figure 11: Stand-in geometry can be created from primitives accessible from a shelf (a) or using hand postures mimicking the desired primitive, such as a sphere (b).

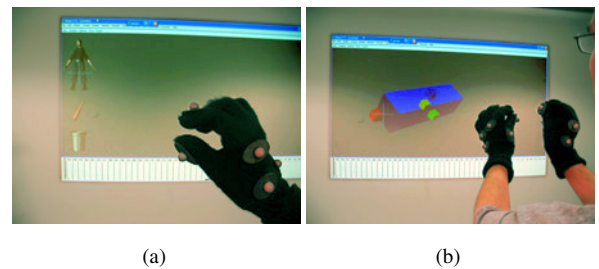


Figure 12: The user can access a model shelf containing references to existing production models, to load them into the scene (a). Object scale can be edited by selecting it and using the non-dominant hand to manipulate the handles of a widget that appears when that hand is near (b).



Figure 13: Scene-specific assets such as the camera and set are accessible to the user via a scene shelf.