Moving Object Removal/ Motion Reconstruction in Stereo Panoramas

Danyang Wang, Xiaoshi Wang, Chenjie Yang

Department of Computer Science and Electrical Engineering, Stanford University

Motivation

Ghost artifacts are common when people taking panorama because they are stitched from many raw images, easily containing moving objects. Ghost artifacts are not desired in panorama but meanwhile the moving path of those objects are valuable and interesting. **We proposed a method** to remove the ghost artifacts in stereo panoramic images and meanwhile reconstruct the movement of moving objects.

Work/Algorithms

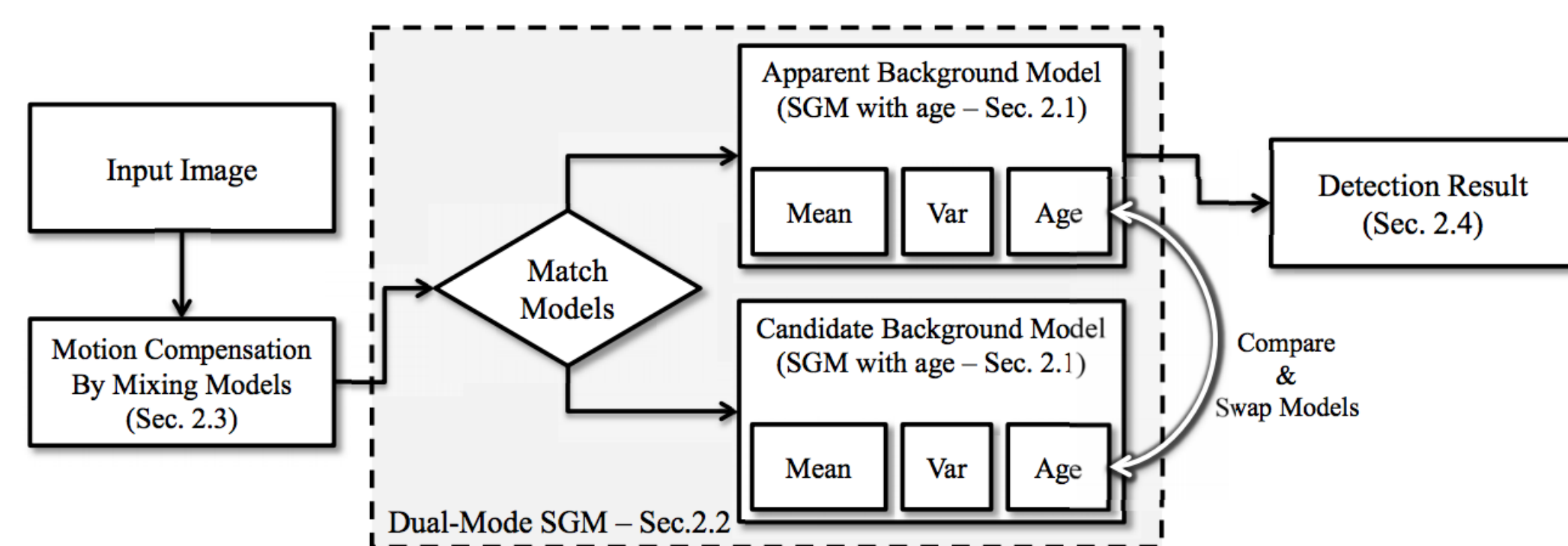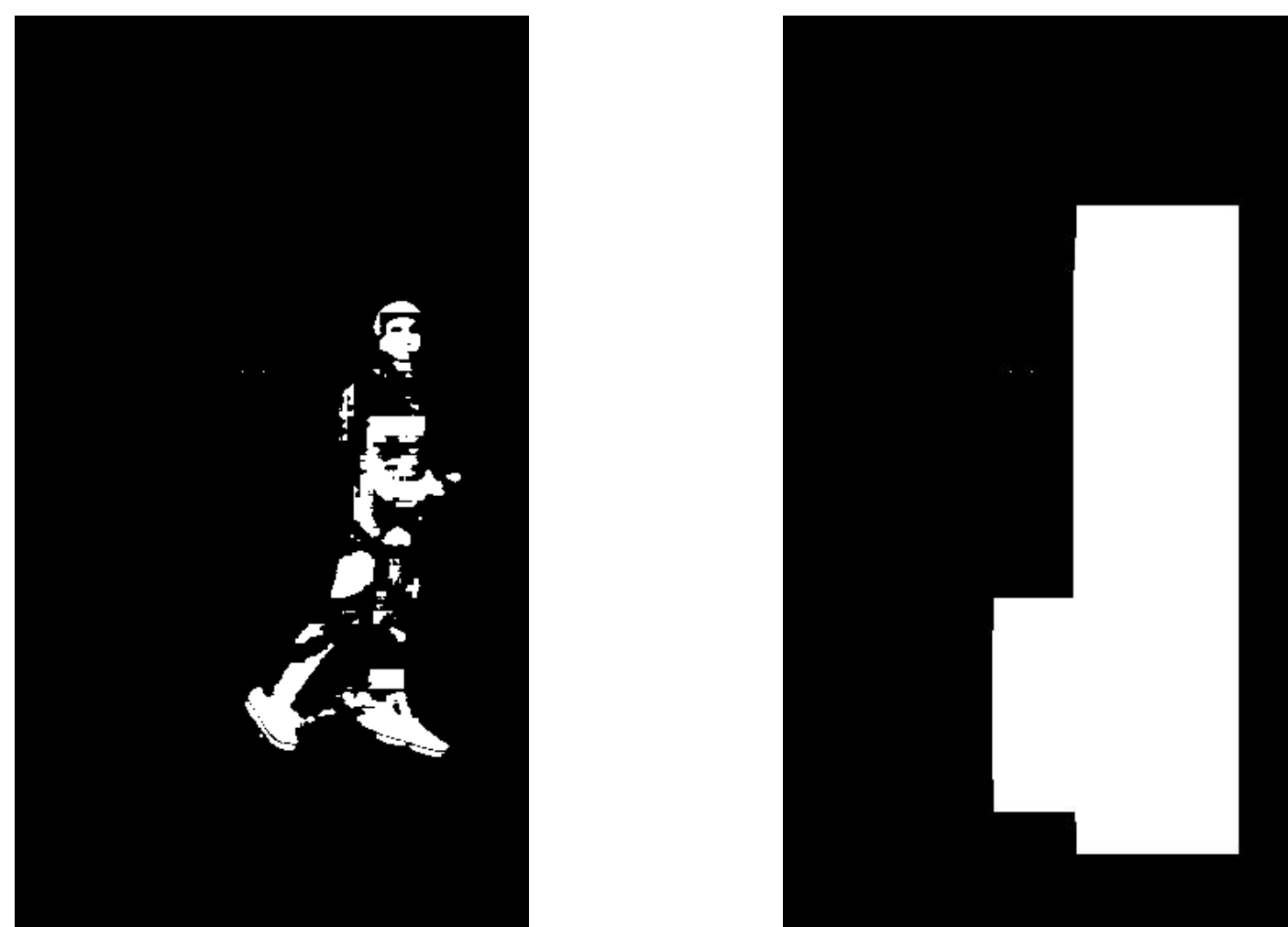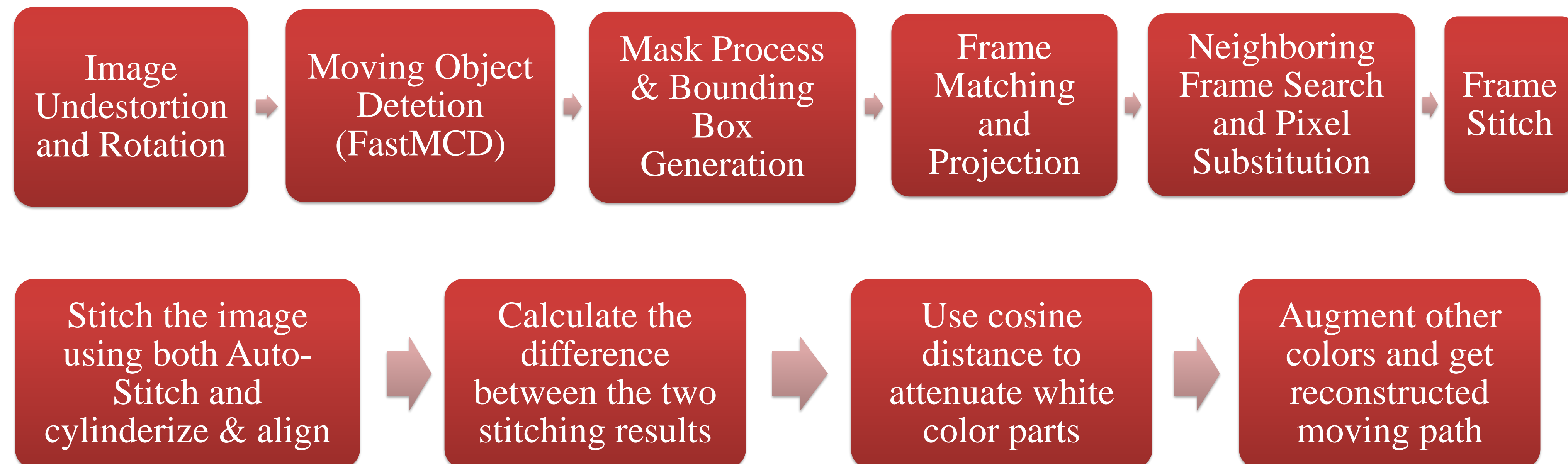**Fast MCD:** Detect moving objects in moving background. K. M. Yi et al. CVPR 2013
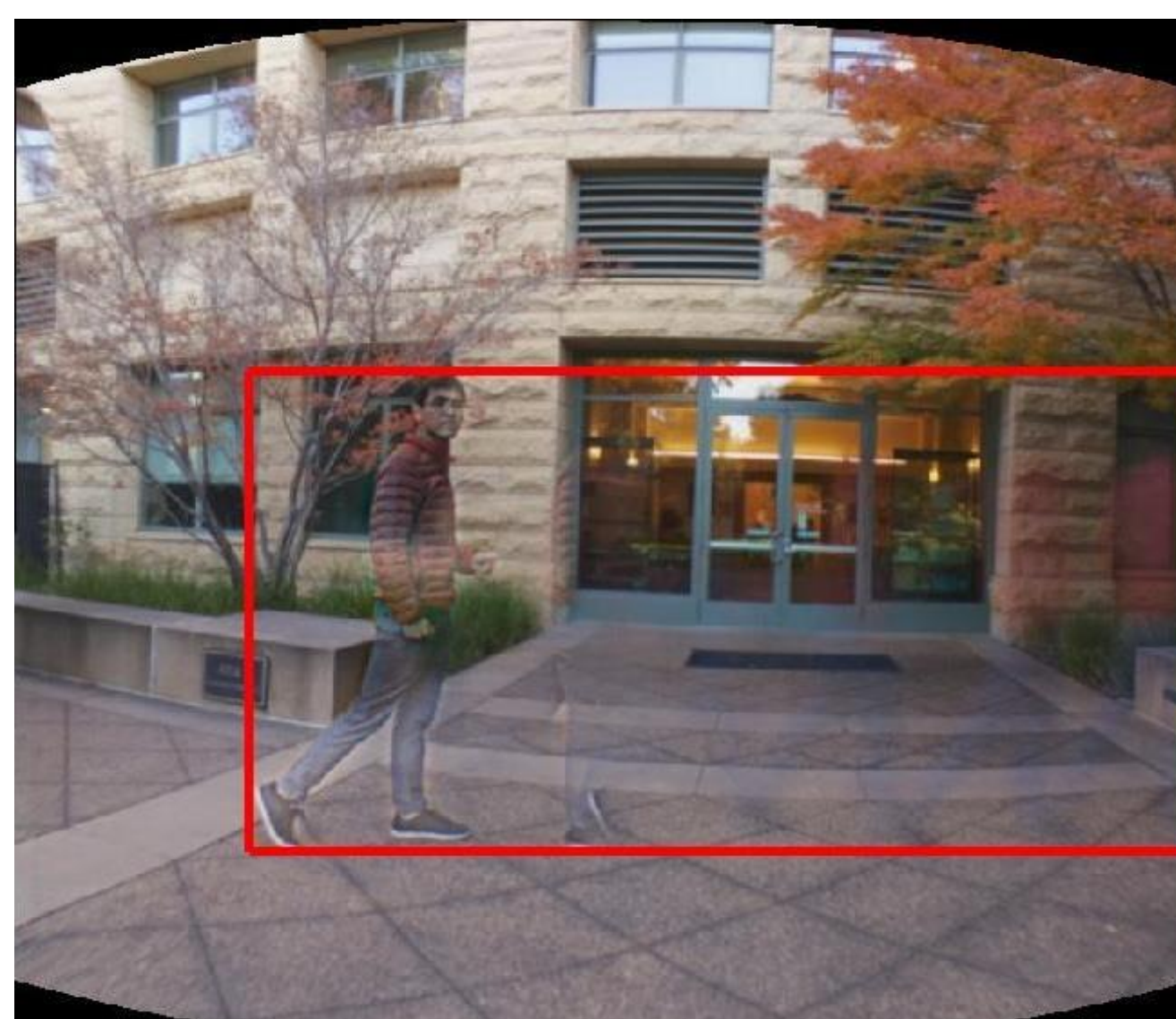

Figure 2. Framework of the proposed method

Mask Optimization: change Fast-MCD mask to bounding boxs.

Moving Object Removal / Motion Path Reconstruction

Image Undestortion and Rotation → Moving Object Detetion (FastMCD) → Mask Process & Bounding Box Generation → Frame Matching and Projection → Neighboring Frame Search and Pixel Substitution → Frame Stitch

Stitch the image using both Auto-Stitch and cylinderize & align → Calculate the difference between the two stitching results → Use cosine distance to attenuate white color parts → Augment other colors and get reconstructed moving path

Experimental Results

Original result after stitching

Our Result after stitching

Reconstructed Moving Path