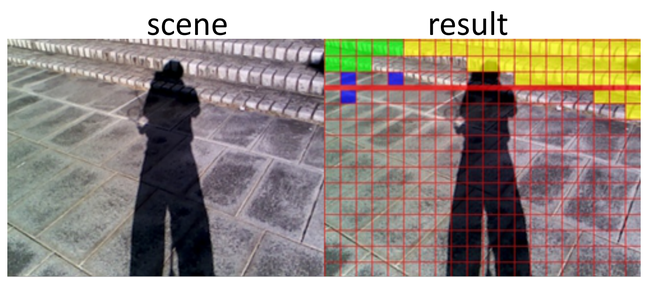
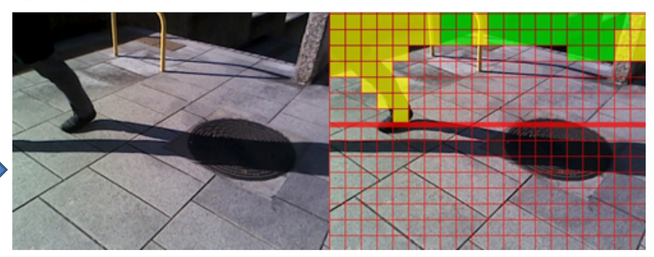
Computational Media Group

Walkable area detection for visually impaired

Safety support on walking of visually impaired is a challenging task.
Our prototype system based on our new depth image analysis can estimate the size and shape of the flat area in front of visually impaired online. It works on both indoor scenes and outdoor scenes seamlessly.

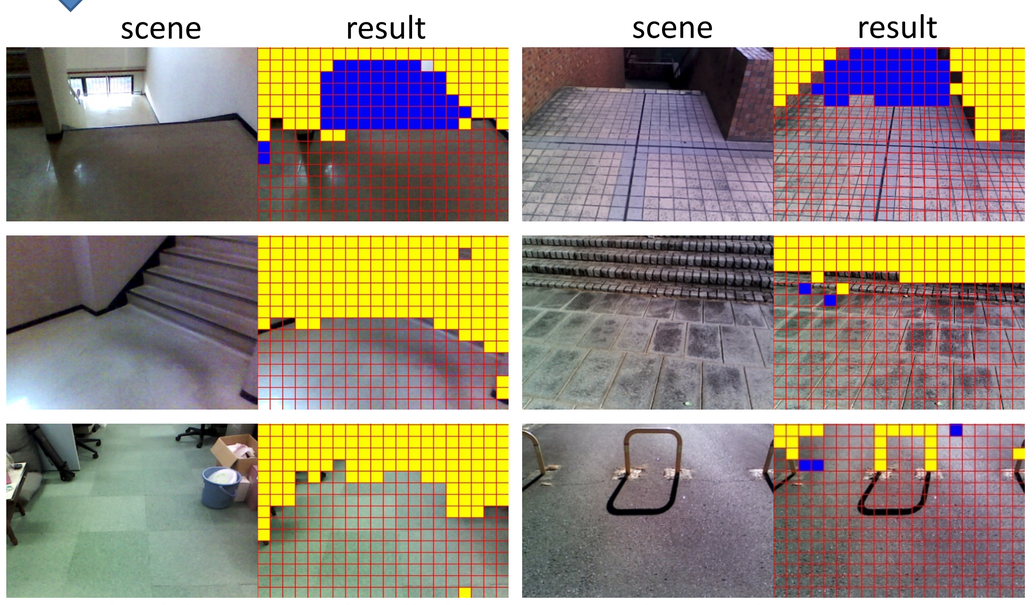


Yellow: higher than the safely walkable plane
Blue: lower (hard to detect by white cane)
Green: out of range (beyond the limit of depth sensor)
Red thick line: end of the safely walkable area



System output on outdoor scenes
(top: up step, bottom: obstacle and down step)

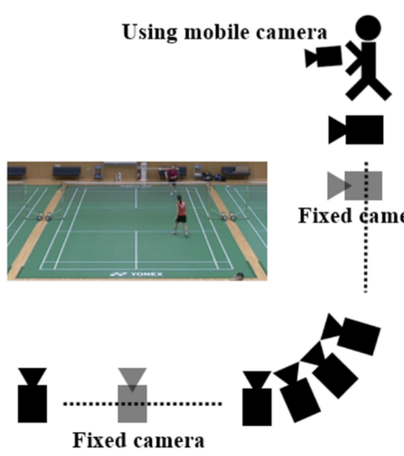
Tablet PC
Unit with a
RGB-D camera

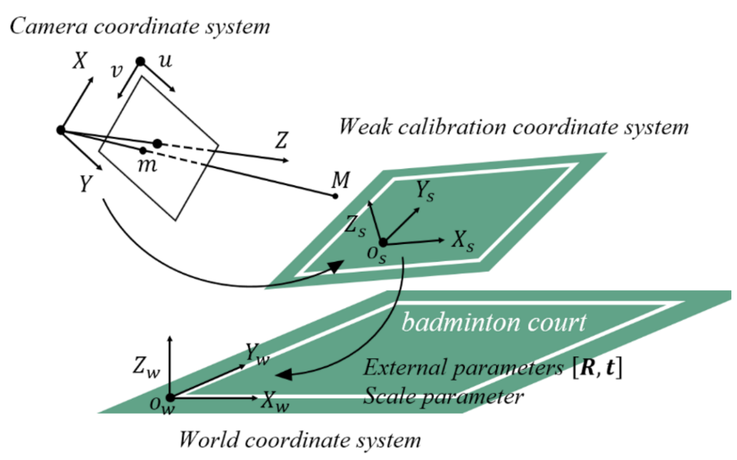


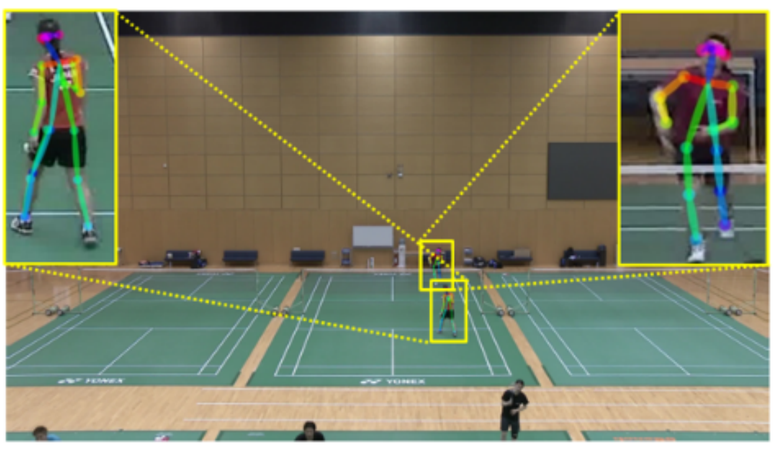
Result of detection of walkable area in indoor and outdoor scenes
(top: down step, middle: up step, bottom: obstacle)

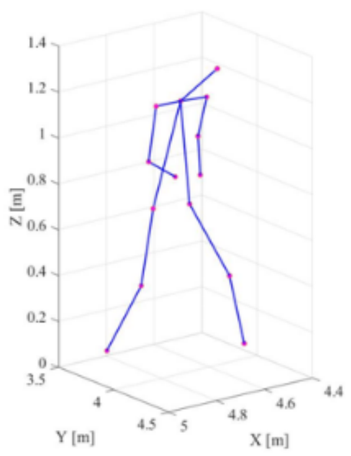
High accuracy of camera calibration for sparsely placed cameras

Accurate estimation of multi-camera position and orientation is the key to 3D motion analysis of people actions. Vision-based camera calibration is very challenging when some cameras have a little overlapping area between them. One mobile camera may unite the shooting areas of the statically placed cameras by its video imaging.









Any coordinate system of the cameras can be expressed in other coordinate systems thus precise 3D motion can be estimated in real sports scenes. It will be applicable to any situations where detailed visual analysis is demanded.