Wide Area Camera Calibration Using Virtual Calibration Objects

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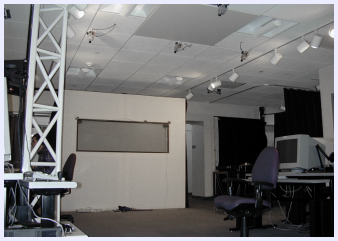
Goal

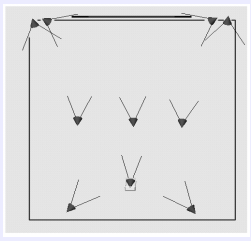
Calibrate many cameras arranged to cover a wide area working volume. Building a large physical calibration object is impractical.

Solution

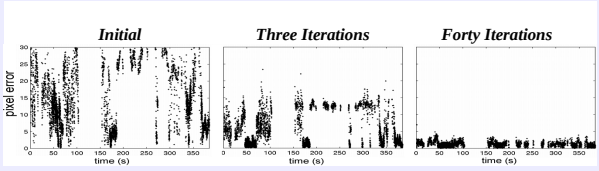
Build a large *virtual* calibration object, that covers the entire working volume.

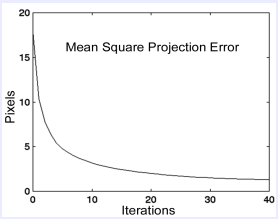
Results





Camera arrangement to be calibrated: Note that since the cameras cover a wide area, traditional calibration is not possible.

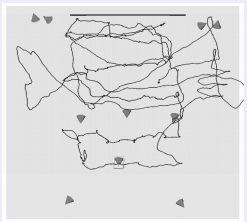




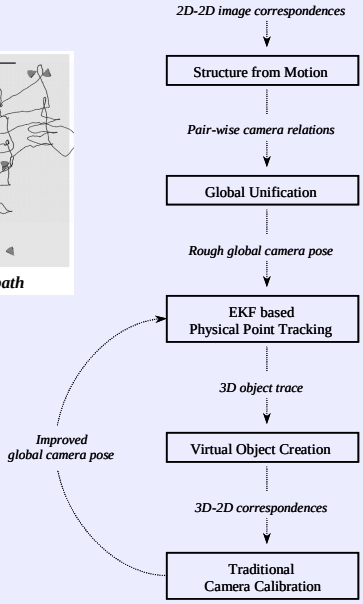
Projection error as a function of iterations using a virtual calibration object: Note that very stable convergence to the correct camera calibration is obtained.

Method

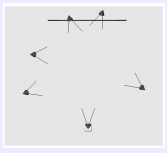
Use all cameras to observe a moving object. Iterate between solving for the object path, and using this path as a *virtual* calibration object to solve for camera position.



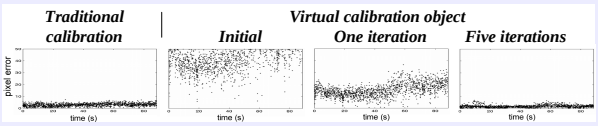
Example object path



Comparison with traditional calibration



A space in which a comparison with traditional calibration is possible.



Projection error of a moving object: Note that the quality of the calibration obtained using our method compares favorably with traditional calibration methods.