

WHAT IS CLAIMED IS:

1. A method of determining dimensional information of a target surface, comprising:
 generating a first point cloud corresponding to a first plurality of reconstructed surface points of the target surface generated by a first imaging system-illumination source pair of a phase profilometry system having a first counterposed channel;
 generating a second point cloud corresponding to a second plurality of reconstructed surface points of the target surface generated by a second imaging system-illumination source pair of the phase profilometry system having a second counterposed channel;
 dividing a volume, corresponding to the target surface, into a set of voxels;
 adding, for each reconstructed surface point in the first and second point clouds, the surface point's signed distance function (SDF) and corresponding weights to the set of voxels along an imaging system ray of each reconstructed surface point in the first and second point clouds;
 identifying a level set of the SDFs for the first and second point clouds; and
 generating a final point cloud based on the first and second plurality of reconstructed surface points, the level set of SDFs, and geometry of the first and second imaging system-illumination source pairs.
2. The method of claim 1 wherein said refining of the initial surface estimate reduces measurement errors caused by specular glints.
3. The method of claim 1 wherein said refining of the initial surface estimate reduces measurement errors caused by reflection gradients of the target surface.
4. The method of claim 1 wherein said refining of the initial surface estimate reduces measurement errors caused by a tilt of the target surface.

7. The method of claim 1 wherein the first imaging system-illumination source pair comprises a first camera from a first operative coaxial camera-projector pair and a first projector from a second operative coaxial camera-projector pair and the second imaging system-illumination source pair comprises a second camera from the second operative coaxial camera-projector pair and a second projector from the first operative coaxial camera-projector pair.
8. The method of claim 7 wherein at least one of the first or second operative coaxial camera-projector pairs is aligned at an oblique angle relative to the target surface and target surface normal.
9. The method of claim 8 wherein at least one of the first or second operative coaxial camera-projector pairs is aligned perpendicularly relative to the target surface.