CLAIMS

1. An optical data acquisition system for capturing non-line of sight features within a workpiece comprising:

a light projector for projecting a plurality of reference dots on a workpiece with non-line of sight features;

a digital camera at a first location to capture the size and orientation of the reference dots;

a digital camera at a second location to capture the size and orientation of the reference dots;

a control subsystem configured to merge images taken by the cameras for triangulation and generation of a three-dimensional relationship and location of the dots;

a turntable for placing the workpiece with non-line of sight features,

an additively manufactured holder configured to be at least partially received within the non-line of sight feature of the workpiece,

wherein the holder comprises:

a handle portion;

an anchor portion opposite the handle portion; and

a float portion to at least partially support the handle portion with respect to the surface of a liquid modeling impression material within the non-line of sight feature of the workpiece.

2. The optical data acquisition system as recited in claim 1, wherein the handle portion is sized to receive at least three reference dots to provide a frame of reference.

3. The optical data acquisition system as recited in claim 1, wherein the handle portion includes a cap portion transverse to a body portion.

4. The optical data acquisition system as recited in claim 1, wherein the handle portion includes a cap portion perpendicular to a body portion.

5. The optical data acquisition system as recited in claim 4, wherein the cap portion is sized to receive at least three reference dots utilized by the optical data acquisition system to provide a frame of reference.

6. The optical data acquisition system as recited in claim 1, further comprising a mesh area adjacent to the float portion, the mesh area at least partially submersible within the liquid modeling impression material when the float portion is on the surface of the liquid modeling impression material.

7. The optical data acquisition system as recited in claim 6, wherein the handle portion, the mesh area and the float portion are additively manufactured.

8. The optical data acquisition system as recited in claim 6, wherein the mesh area is additively manufactured to fit within the non-line of sight feature of the workpiece.

9. The optical data acquisition system as recited in claim 1, wherein the anchor portion forms a platform receivable within the non-line of sight features.

10. The optical data acquisition system as recited in claim 1, wherein the anchor portion is a rectilinear platform.

11. The optical data acquisition system as recited in claim 10, wherein the mesh area comprises numerous apertures located adjacent to the anchor portion and the float portion.

12. The optical data acquisition system as recited in claim 6, wherein the holder includes a flow channel to communicate the modeling impression material into the non-line of sight feature.

13. An optical data acquisition system for capturing non-line of sight features within a workpiece comprising:

a light projector for projecting a plurality of reference dots on a workpiece with non-line of sight features;

a digital camera at a first location to capture the size and orientation of the reference dots;

a digital camera at a second location to capture the size and orientation of the reference dots;

a control subsystem configured to merge images taken by the cameras for triangulation and generation of a three-dimensional relationship and location of the dots;

a turntable for placing the workpiece with non-line of sight features,

an additively manufactured holder configured to be at least partially received within the non-line of sight feature of the workpiece,

wherein the holder comprises:

a handle portion;

an anchor portion to be immersed in a liquid modeling impression material within the non-line of sight feature of the workpiece;

a float portion between the handle portion and the anchor portion, the float portion operable to at least partially support the handle portion with respect to a surface of the liquid modeling impression material; and

a mesh area adjacent to the float portion, wherein the mesh area is at least partially submersible within the liquid modeling impression material when the float portion is on the surface of the liquid modeling impression material.

14. The optical data acquisition system as recited in claim 13, wherein the handle portion is sized to receive at least three reference dots.