System Integrating 3D and Visual Photography for Forensic Imaging and Advertising Applications;

DII Internal Project, 2017

Handheld 3D-Visible Camera Product

The system we're developing would combine data from a 3D camera with a traditional DSLR camera. Under and internal research project, DII has been investigation the technology and potential for development and sale of a 3D-Visible camera system for a variety of photographic markets. Some potential applications include forensic, advertising and portrait photography. The 3D and 2D images from the two cameras would be wirelessly linked, fused, displayed and store on a tablet or laptop computer. This concept is illustrated in the following figure.

Handheld 3D-Visible Camera System

System includes:

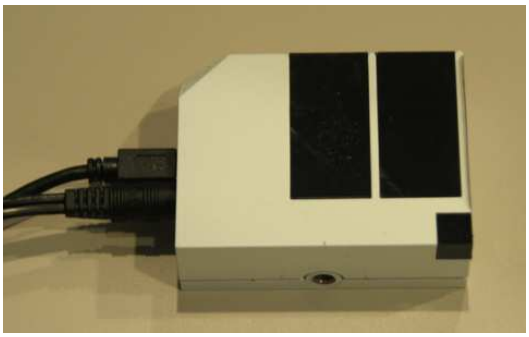
- 3D Camera Mounted to/with Digital SLR Camera
- Collection software for an Android tablet computer which provides wireless link to cameras
- Scene fusion software running on the Android tablet to merge multiple shots and generate 3D scene data for export to 3rd party 3D CAD scene modeling, reconstruction and display software

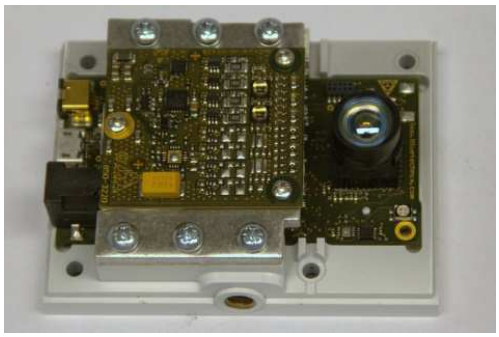
Each "3D Photographic Shot" includes:

- Registered and geometrically calibrated 3D range image fused with visible color image
- Range quality measure for each range point in the 3D image
- Standard metadata from 2D camera photograph
- GPS Location Data
- Time Stamp

Handheld 3D-Visible System Component Exploration

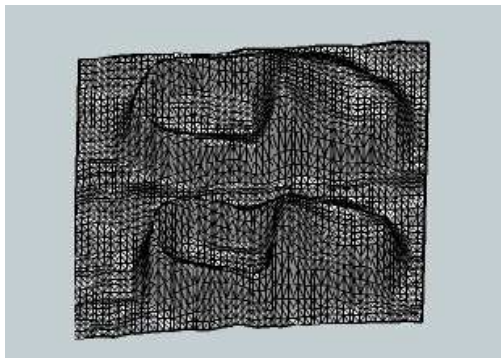
To explore current 3D sensor capabilities and begin to work on a prototype forensic camera system, DII has purchased a 3D camera system from Bluetechnix Group GmbH. This system, which consists of in integrated laser source, 120x160 pixel focal plane and processing electronics, is shown in the figure below. The sensor has a range of 2.55 meters, range resolution of better than 1% and a maximum frame rate of 30 fps. The system has a USB port for control and data acquisition. The packaged and naked sensor is shown below.





Bluetechnix 3D Sensor

We have been experimenting with this sensor for forensic applications. Some examples of acquired 3D imagery, displayed in SketchUp as a wire-frame model is shown below. We have also been developing an interface that will allow data acquisition and control by software running on an Android Tablet computer.



Photograph and 3D Model of Shoes Measured with Bluetechnix 3D Sensor