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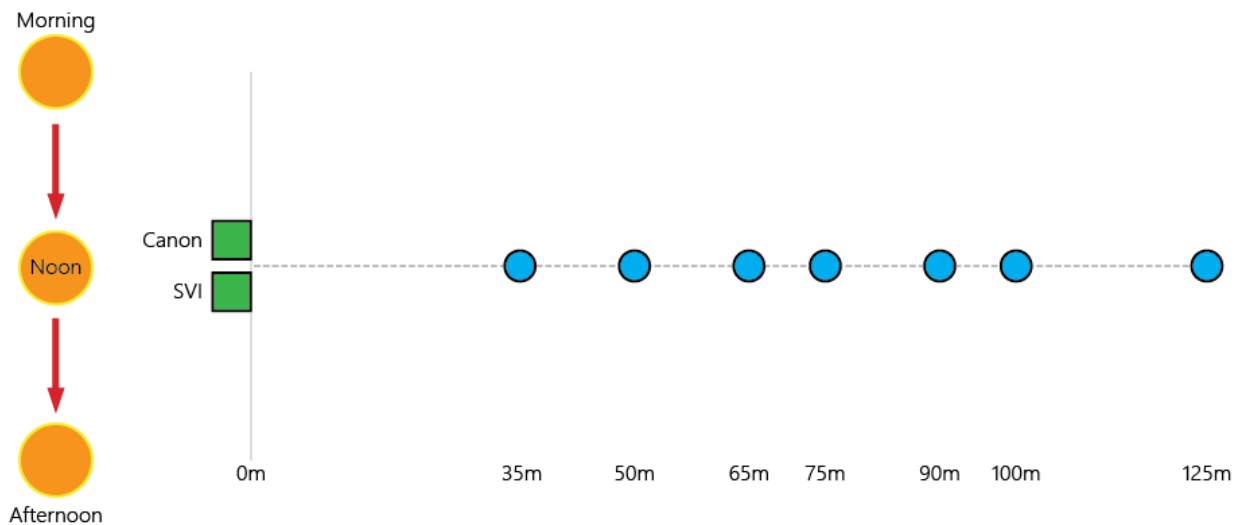




fixture and dual 500-watt fixtures. The positioning of these sources with respect to the participant is slightly asymmetric and there is sufficient distance between the backdrop (neutral gray) and the participant to avoid shadows on the background. In addition, plastic diffusers in front of the reflector-mounted light bulbs are utilized to avoid “hot spots” on the face.

### 2.2.2 Outdoor Image Capture

This iteration of the SVI binoculars has auto-focusing and auto-exposure capabilities. Images were captured at distances of 35, 50, 65, 75, 90, 100 and 125 meters to survey the quality of images at varying distances from the SVI camera system. To accommodate these large distances, data collection was performed outdoors on the WVU Evansdale engineering campus. A schematic view of the collection setup is shown in Fig. 3.



**Figure 3:** Outdoor collection setup.

The imaging devices were co-located to make imaging distances as equivalent as possible. Camera alignment was chosen to provide varied natural illumination on the faces throughout the day. By situating the cameras and image capture direction so that the sun was behind the collection hardware, facial illumination was most uniform during midday, with strong left or right illumination in the morning and afternoon. This was mainly the case for sunny days, with cloudy or overcast days resulting in uniform facial illumination. Since the Engineering Research Building blocked the light from the left side of the face, most strong illumination appears on the right side of the face in sunny conditions.

The SVI camera included a pre-set exposure setting called, ‘Tripod Mode.’ In this mode, the binoculars auto-corrected for exposure differently than when turned off. This led to challenges acquiring images in low-light conditions (dusk, cloudy, overcast, etc) with tripod mode set to “off.” Due to time limitations and with the consent from ManTech Inc. images which normally would be collected with Tripod Mode *off*, could be collected with the mode *on* when necessary. This was to allow for a higher exposure during lower light conditions.

### 2.3 Data Types & Organization

The following data was collected from each participant:







































