CULTURAL HERITAGE DOCUMENTATION AND CONSERVATION: THREE-DIMENSIONAL (3D) AND GEOGRAPHICAL INFORMATION SYSTEM (GIS) TECHNIQUES FOR SHRAPNEL DAMAGE OF FACADE SCHOOL OF MEDICINE OF THE COMPLUTENSE UNIVERSITY OF MADRID

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Projectile damage to buildings is a wide spread, yet underrepresented in weathering and conservation research as mechanism of deterioration. Affected sites range from buildings damaged in past conflicts, such as the First World War, to modern day threats to heritage properties in Syria and other countries, and field observations indicate that the effects of bullets and shrapnel impacts on building materials damage the materials both immediately and further deteriorate in the long-term. This communication deals with the documentation of spread and frequency of shrapnel damage on the School of Medicine of the Complutense University of Madrid. GIS was used to map damage as well as to determine focal points of impacts and therefore establish distance and other parameters that can be of use both from the point of view of documentation and studies on the long-term effect of this particular kind of damage.

The School of Medicine of the Complutense University is a listed building completed in 1935. The building was chosen as war damage, which was inflicted very soon after the completion of the building, during the 15 -18 November 1936 assault. The site was part of the battlefront for the duration of the war (1936-1939). As a consequence of this, the building was largely destroyed. Between 1941 and 1945 the building was reconstructed, during which bullet and shrapnel impacts across the whole building façades were deliberately preserved.

A digital 3D model of the areas affected by shrapnel was produced to accurately document the location and characteristics of each impact. Single image photogrammetry was used to produce this 3D digital model of the walls, which was then used for GIS-based surface modeling. This approach yielded a dataset of accurately georeferenced physical characteristics of each of the impacts. This 3D analytical data provides a new insight into the damage caused by shrapnel impacts, which aids not only the restauration and preservation of this site but could be carried across to conflict sites where conservation analysis can play a crucial role in post-conflict heritage conservation.

Figure 1. Shrapnel damage in the School of Medicine

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