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The Application of Semi-Automated Vector Identification to Large Scale Archaeological Data Sets Considering Anomaly Morphology

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Large area, high sample density data acquisition using both vehicle towed magnetometer arrays and multi-channel GPR systems provide highly detailed coverage of near-surface, archaeological remains at a landscape scale. This produces a considerable volume of data, often in the form of multiple amplitude time or depth slices of the buried ground surface, which can present a considerable challenge for the subsequent identification and interpretation of significant archaeological anomalies. The application of semi-automated analysis of magnetic and GPR data sets to identify georeferenced vector objects from the original raster data can assist with the interpretation and presentation of large area surveys. Edge detection algorithms can rapidly abstract closed polygons defined by a user defined amplitude threshold and have been demonstrated to be very effective when applied to GPR data sets (Schmidt and Tsetskhladze 2013; Verdonck 2016; Leckebusch J et al. 2008). The potential archaeological significance of the vector objects is then determined through a consideration of the morphology and continuity between data sets. A particular application is made to the location of pit-type anomalies, which are often highly numerous across a landscape, yet can be time consuming to interpret through manual extraction of each individual response from multiple layers within a data set. Defining specific constraints, in terms of the accepted size of a potential pit-type feature, likely depth and whether it presents a circular outline can assist in the classification of the anomalies and can be expanded to include other potential target features and applications.

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