



## **Spatiotemporal conceptual platform for querying archaeological information systems**

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Spatial and temporal distribution of archaeological sites has been shown to associate with several attributes including marine, water, mineral and food resources, climate conditions, geomorphological features, etc. In this study, archeological settlement attributes are evaluated under various associations in order to provide a specialized query platform in a geographic information system (GIS).

Towards this end, a spatial database is designed to include a series of archaeological findings for a secluded geographic area of Crete in Greece. The key categories of the geodatabase include the archaeological type (palace, burial site, village, etc.), temporal information of the habitation/usage period (pre Minoan, Minoan, Byzantine, etc.), and the extracted geographical attributes of the sites (distance to sea, altitude, resources, etc.). Most of the related spatial attributes are extracted with readily available GIS tools.

Additionally, a series of conceptual data attributes are estimated, including: Temporal relation of an era to a future one in terms of alteration of the archaeological type, topologic relations of various types and attributes, spatial proximity relations between various types. These complex spatiotemporal relational measures reveal new attributes towards better understanding of site selection for prehistoric and/or historic cultures, yet their potential combinations can become numerous. Therefore, after the quantification of the above mentioned attributes, they are classified as of their importance for archaeological site location modeling.

Under this new classification scheme, the user may select a geographic area of interest and extract only the important attributes for a specific archaeological type. These extracted attributes may then be queried against the entire spatial database and provide a location map of possible new archaeological sites. This novel type of querying is robust since the user does not have to type a standard SQL query but graphically select an area of interest. In addition, according to the application at hand, novel spatiotemporal attributes and relations can be supported, towards the understanding of historical settlement patterns.