

Marsweb (Http://Marsweb.Net) : Gis Based Web 2.0 Mapping Application for Rapid Measurement of Impact Craters on the Surface of Mars

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A web-based mapping application of a pre-existing ARCGIS tool has been developed to allow both professional and amateur geologists to participate in a large scale web-GIS project to map craters on extra-terrestrial bodies, starting with the planet Mars. The context is the dating of the surface of Mars which can be retrieved using crater size frequency distributions (Kim et al., 2005 [1]) or crater 3D shape (Kim & Muller, ISPRS 2008). A Web 2.0 system can be characterised by sharing information dynamically and interactively over the Internet, and has a huge potential for many different community mapping efforts. This paper describes a GIS-based Web 2.0 map-ping application developed at UCL to identify and measure the shape of impact craters of Mars interactively. The system provides a generic framework for users, both professional and amateur, to actively en-gage in mapping Mars by creating, sharing, aggregating and using crater information in a variety of formats that work in traditional GIS and planetary software.

The system is composed of four components. A Persistent RDBMS part developed using Postgres with PostGIS, a Server component based on a J2EE Multi Layer Architecture Platform, a web client based on OpenLayers, ExtJS, and ExtFlot, AJAX opensource frameworks; and a Web Map Server to deliver the crater information generated by the users. Taking advantage of OGC standard-oriented architecture, the system is able to access layers from distributed map services [2-4], including cascaded WMS services added by the users allowing them to create new views of the maps by using WMS layer transparency. Users can draw simple impact crater boundaries with minimal manual input or can import previously measured craters from shape file or text files; they can also indicate characteristics of each crater via the generation of tags. After creating their own crater catalogues, users can share these crater measurements with others in the online community. Finally the system provides two basic crater analysis functionalities: Plot Crater Profiles and Plot Crater Count Size-Frequency Distribution which are based on previous work by G. Michael (Freie Universität Berlin) [5]. Examples of different aspects of the tool are shown in Figure 1. Further examples including a live demonstration will be shown and the accuracy of the resultant isochrones assessed using previous manual measurements.

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References:

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