

ABSTRACT

The emergence of the web technologies has allowed people to communicate and share information through collaborative websites like *Wikipedia*. At the same time, the development of digital maps like *Google Maps* have broadened the appetite for tools that provide geospatial analysis. Despite attempts to merge the collaborative features of *Wikipedia* with the functional features of *Google Maps*, the results so far lack the flexibility to be used in many research fields. The aim of my research is to develop a web application framework to enable the development of highly focussed and accessible geospatial programs.

GoogleMaps meets Wikipedia

Background

WIKIFICATION

The past decade has seen a revolution in how data can be collected, stored and disseminated. Perhaps the most interesting trend is the development of publicly accessible, collaborative information repositories – *Wikipedia* being the best known.

Since it went online in 2001, *Wikipedia* has collected and collated over 18 million articles which can be viewed, edited and cited – to the annoyance of many a lecturer. We know its faults: it can be accused of leading to shoddy research practices and a decline in the depth of analysis. However, the true value of *Wikipedia* is not so much a matter of accuracy and depth as of currency and coverage. Its sheer comprehensiveness makes it the first port of call for researchers investigating unfamiliar topics, however obscure or esoteric. Also, *Wikipedia* and ‘Wiki’ sites in general are responsive to changing events because its users can easily contribute and edit information.

Many specialised ‘Wiki’ sites have emerged that have further refined the collaborative mechanisms pioneered by *Wikipedia*. These sites have provided a framework appropriate for globalised collaboration, especially for the amateur expert.

NEO GEOGRAPHY

This same period has seen the transition of geospatial technologies from isolated offline systems to integrated online systems whose access is widely distributed across the web. The success of tools such as *Google Maps* has shown that there is a growing appetite among non-expert users for the analysis tools provided by Geographic Information Systems (GIS). ‘Neogeography’ is the idea that geographical techniques and tools can be utilised by individuals and communities who do not necessarily have the advanced technical ability that was traditionally required. In effect ‘Neogeography’ can be seen as the removal of the traditional technical and financial barriers to accessing GIS.

COLLABORATIVE GIS

Google Maps is a functional resource that is used by a broad community who have little input into how the tool works. Conversely *Wikipedia*, whose functionality is limited, is entirely created by the community that uses it.

A logical progression from these two developments would be to combine the functionality of *Google Maps* with the collaborative composition of *Wikipedia*. A variety of projects have emerged that are built on volunteered data and provide open access to geospatial functions. One such project is *Open Street Map* which has demonstrated the advantage of collaborative GIS by outperforming commercial systems in terms of response to need and speed of map-building.

My Research

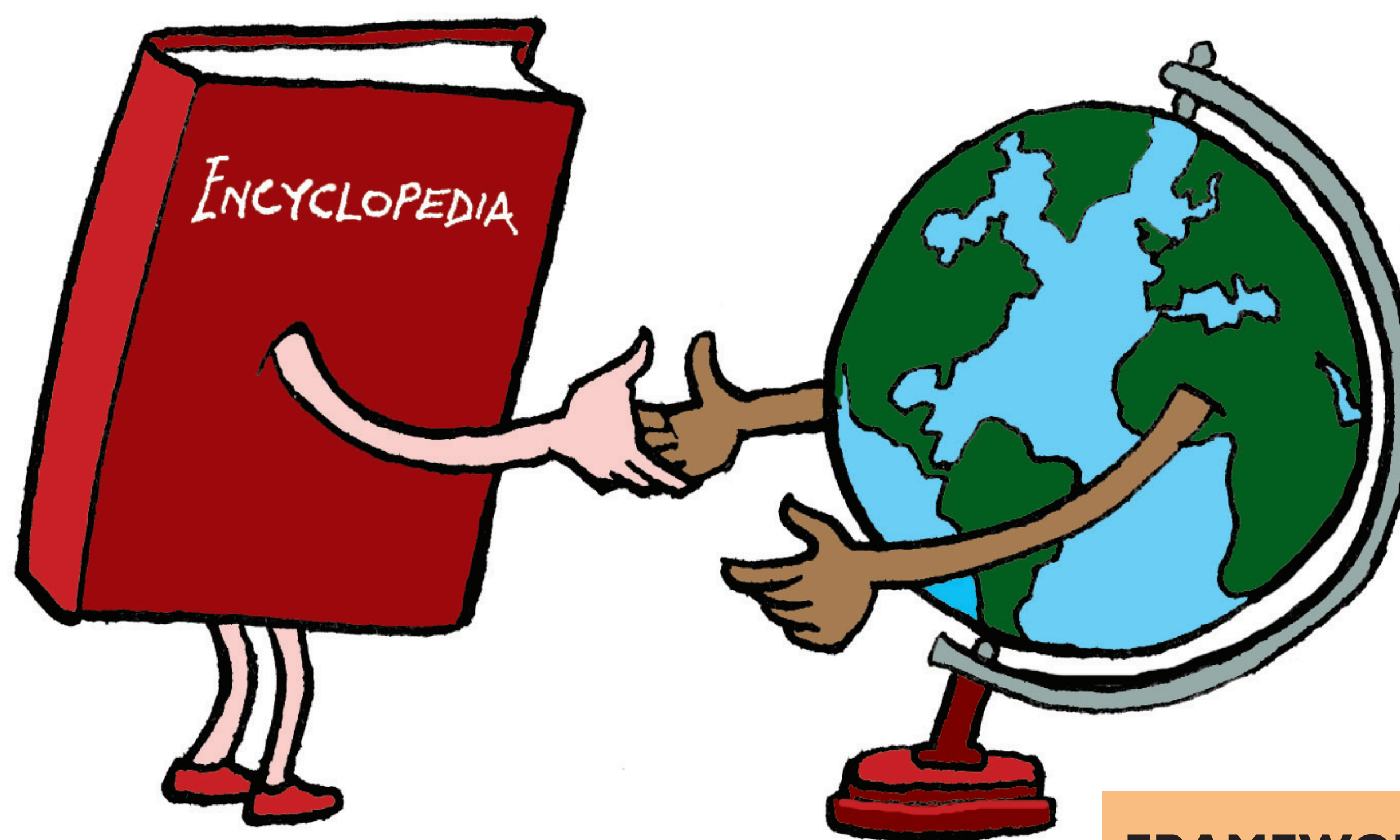
DOMAINS

The problem with collaborative GIS at the moment is that the tools it uses are tailored to the needs of geographers. This makes it difficult to adapt collaborative GIS to fit other conceptual frameworks. For example, a historian might want to define elements in a map that only exist for a particular duration – and then be able to use that map to depict the geospatial behaviour of objects over a period of time. This would require a set of temporal tools to establish a timeframe for map objects.

Another example might be a cycling community who want to collect information from users about local cycling conditions and then use a route-finding algorithm that employs the collected data to suggest the optimum route.

Both these examples demonstrate that different subject domains require specific tools which are not being consistently offered by existing collaborative GIS projects.

Developing a web-application framework to build collaborative GIS



FRAMEWORK

To develop collaborative GIS to fulfil the needs of a broader range of research communities, I am designing a web application framework that provides core geospatial tools that can be adapted to a wide range of domains.

Using such a framework, a project administrator would be able to define domain-specific concepts and to build the appropriate analysis tools that could be used to develop useful collaborative GIS.

A **Wiki** is a website that allows users to alter its contents through a simple, easy-to-use editor.

Web Application Framework

A set of standards and core software functions that allow for the creation of computer programs that have access to the web.

Geospatial

A term widely used to describe the use of spatial analysis methods with geographic data.

CHALLENGES

ENSURING INTEROPERABILITY

The ideal framework would provide a platform that would perform core geospatial reasoning functions while maintaining consistency and interoperability.

To achieve this, my framework will adhere to a set of clearly specified standards governing the use of geospatial data.

HANDLING UNCERTAINTY

By its very nature the accuracy of volunteered information is uncertain. It cannot be assumed that submitted data has been collected scientifically or that supporting technology, such as GPS devices, have functioned correctly.

To address this, I plan to apply automated reasoning techniques to the incoming data to establish its reliability.

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