



## Tripod Annual Report

[www.ProjectTripod.org](http://www.ProjectTripod.org)

The objectives of Tripod are to automatically build rich multi-faceted text and semantic descriptions of the landscape and permanent man-made features pictured in a photograph; create image search facilities that serve broader user needs than current keyword or content-based approaches provide; build captions in a range of different languages; automatically update captions, when new information about a location becomes available; package Tripod's tools as a suite of services to prepare Tripod for exploitation in a wide range of markets.

Tripod will achieve these objectives by using GPS and electronic compasses to determine the location of a photographer and the direction in which they were facing when a photograph is taken. Combining this information with digital maps and by taking information from the web, captions can be automatically created.

### Summary of Activities

- Tripod is still in its first year of activity; as such the work in the project so far has focussed on requirements analysis, data gathering and establishing the state of the art in the field.
- A major requirement capture was conducted, where, through competitor analysis, examination of user queries, interviews with photo-library managers and conducting of surveys, a strong need for Tripod's automatic captioning technology was established.
- Project partners are currently undertaking a survey of GPS devices to determine, which produce the most accurate "geo-referenced" photographs and which are the most convenient to use.
- Creation of an integrated image management system is currently underway.
- The project partners have all also been publicising the project through dissemination of brochures and presenting Tripod at conferences and other colloquia.

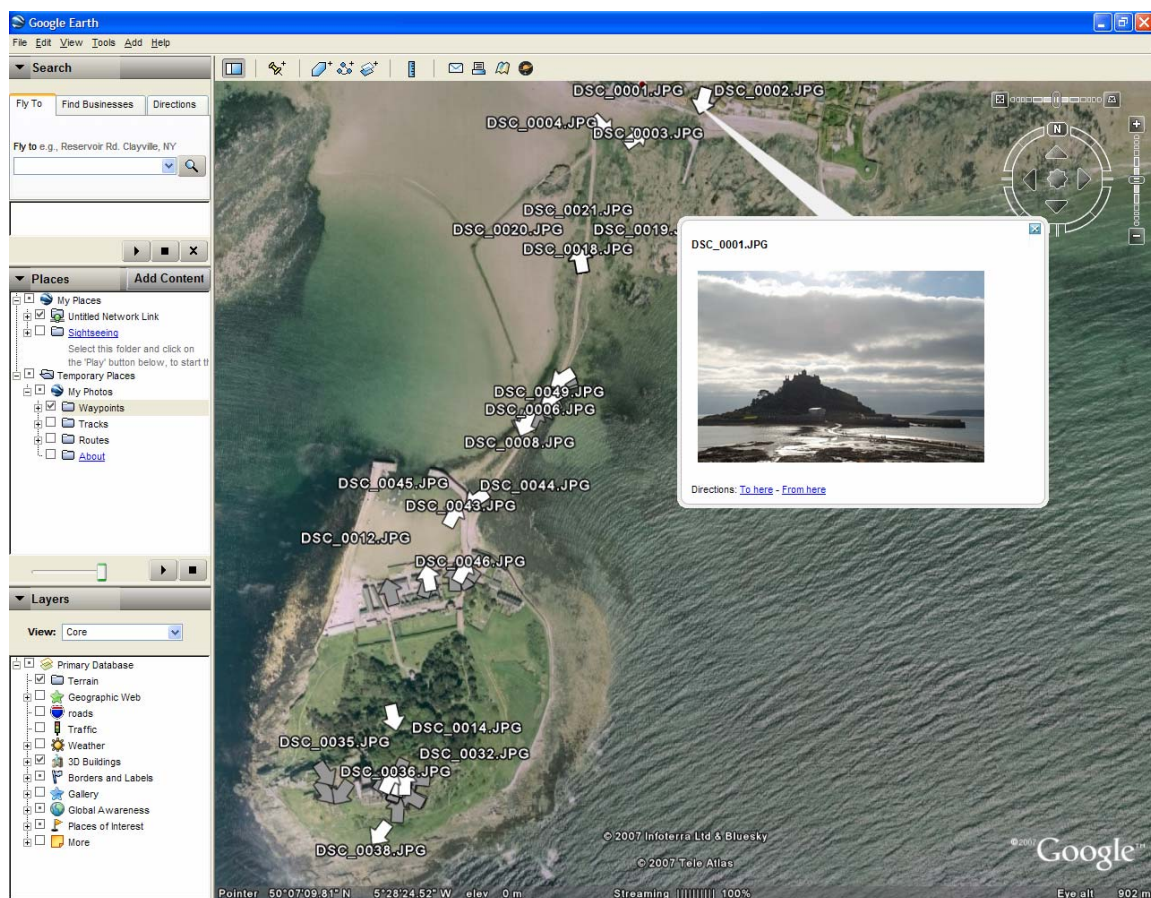
### User requirements

- An extensive user requirements analysis has just been completed, taking into account a wide range of methodologies to establish the range and diversity of needs for the automated caption building Tripod can provide.
- An analysis of 50,000 queries submitted to an existing image search engine was conducted, where it was determined that around 30%-45% of user queries for images include a geographic component.
- In interviews with seven users and managers of image libraries it was clear that across all users, location was important for searching.
- Twenty image libraries were randomly selected and their searching facilities were tested. Although many supported location searching through use of keywords in captions, very few had explicit support for location search, a feature Tripod will provide.

## Survey of GPS devices

A core assumption of the Tripod project is that cameras of the future have integrated GPS and digital compasses. Although a number of cameras now have integrated GPS, or support communication with external GPS devices, there are currently no mainstream devices on the market that support GPS and compass information being loaded into photographs. Consequently, Tripod partners have been examining solutions to take pictures where the additional spatial data is also captured.

Simply carrying a GPS unit with built in compass and recording on it when a photograph is taken, provides a cheap solution, but taking such photographs has been found to be time consuming. More integrated solutions have been examined, which although are more costly, are less intrusive for the photographer. As part of testing of the output of the various image systems, captured images were loaded into Google Earth to allow the photographer to examine the accuracy of the GPS location and compass direction. In the figure below, each arrow represents a photograph taken at a certain location facing in a particular direction. The photograph associated with the arrow at the top is shown and it can be seen that the photograph is of the small island pictured in Google Earth.



## Creating an integrated image management system

Tripod partners will develop their system within a common framework centred on XLPhoto created by Tripod partner Centrica. Much work has gone into the design of the Tripod system and details have just been published in the Deliverable D1.3. XLPhoto will act as a central database through which a series

of remote services will provide caption creation, augmentation and image content analysis services. In order to ensure that the services can ultimately be centralised into a common stand alone system, a virtual machine is being distributed to Tripod partners on which all development will take place.

## **User Involvement, Promotion and Awareness**

Through the requirements gathering, Tripod has engaged with a wide range of industry groups and users.

It is planned that these contacts will be maintained through a regular newsletter informing colleagues of Tripod activities.

The project's web site is ranked highly on Google for the query, Tripod project; this is also an indication of the awareness of the Tripod in the wider community as Google ranks site high that have many links to them.

The project partners are regularly publishing research emanating from Tripod in international conferences and workshops. They are also presenting the project at relevant European-level meetings.

## **Future Work or Exploitation Prospects, as appropriate**

The coming year is an exciting one for Tripod, as this will be the time that the project's caption generation systems start to come to fruition and captions will be automatically generated from geo-referenced images.

## **Further Information**

The Tripod Coordinator, Mark Sanderson can be contacted either through email at [m.sanderson@shef.ac.uk](mailto:m.sanderson@shef.ac.uk). General information about the project can be found at [www.ProjectTripod.org](http://www.ProjectTripod.org).