Using Condor in the Institute of Geography, School of GeoSciences, University of Edinburgh

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1. Introduction
Condor was installed on 39 PCs running Windows in order to accomplish one particular project within the Institute of Geography. In a typical run 330 CPU days were harvested in 9.94 days.

The application of either HTC or parallel processing in geographical analyses remains rare. Despite a proliferation of data, and of urgency for high quality collaborative research and policy-making, the expectations of those developing geospatial applications are still largely determined by the capabilities of commercial software running analyses on the desktop, albeit with increasing use of powerful servers and web services for data.

The availability of high performance computing opens scope for new approaches in geospatial data processing – as well as for approaches that had previously been discarded as impractical. Intervisibility is such an example, for in analyses based on visibility it is routine to seek relatively complex algorithms to reduce computation times. We explored the alternative route, in applying high-throughput computing to intervisibility analyses, so achieving relative algorithmic simplicity and opening possibilities for new applications using intervisibility data.

2. The application: intervisibility analysis

One of the basic products of intervisibility analysis is the “Masked Area Plot” which identifies the areas that can be seen from a post of a Digital Elevation Model. A DEM is a regular array corresponding to a region of the Earth’s surface; each cell contains the height of the corresponding point in the region, termed a “post”.

Figure 1 shows one such Masked Area Plot: the green areas are visible from the post shown by the cross. The background is a hill-shaded derivative of the DEM.
Condor was used in creating a “Complete Intervisibility Database” (CID), comprising a Masked Area Plot for each post of the DEM (Also see poster 1 from the Condor week web page)

Java applications were developed to interrogate and process the CID (poster 2 from the Condor week web page). These a) generate descriptive surface metrics used to characterise the Masked Area Plots and b) were used in interactive tactical decision aids.

User interfaces to the metrics, Masked Area Plot display and the tactical decision aids were integrated with a commercial Geographical Information System.

**Further information:**
Links to associated posters, one from the Geocomputation 2003 conference at Southampton and one from the ESRI User Conference 2004 are on the Condor Week website.

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