

GIS and the Grid: University of Leeds, 13/9/05

The GeoVUE Node

*An e-Social Science Node Focused on
Spatial Analysis, VR and the Grid*

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A Brief Outline of Our Project Proposal

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1. What is GeoVUE? What are VUEs?

The idea is that we take Visualization well beyond conventional 2D map analysis, into letting users create their own computer environments – VUEs.

Our focus on this is ‘virtual urban environments’ – VUEs – which are visual mainly (but not exclusively) and depend on VR in the most general sense

This requires us to mobilize data and software in remote places and networks to access this, i.e. the Grid, the Web, Cyber-infrastructure, whatever we call it.

Our focus will be largely geographical initially in the 2D sense of the map but ultimately 3D and beyond to 4D....

2. The Grid, Visualization & e-Science at UC

We hope to do all this on the Grid. We are beginners but we would argue that our role is not to devise new software but to use what has been created by others.

Our problems are not computationally intensive per se but more geared to moving data and software together to achieve some purpose – spatial analysis , policy analysis, and communication of abstract ideas using visually intelligible media.

We will begin in closed environments, in the ac.uk domain, where IPR issues are minimal and then slowly as the project proceeds advance into the rest of the public sector.

We hope to use standard protocols to enable this but we will undertake a detailed review of possibilities to begin with focusing on:

- *The Grid, VR and Visualization*
- *Spatial Data in the Grid and Net*
- *Standards and IPR*
- *GIS and the Grid, linking to ESRI with whom we have good relations*

We will also explore alternatives to the Globus middleware where people at UCL like Peter Coveney are developing more user-friendly systems.

UCL has many e-science projects and we will link strongly with these. Ours is perhaps the most visual of these.

3. Three Demonstrators

- *ESDA and 2D GIS over the Grid*

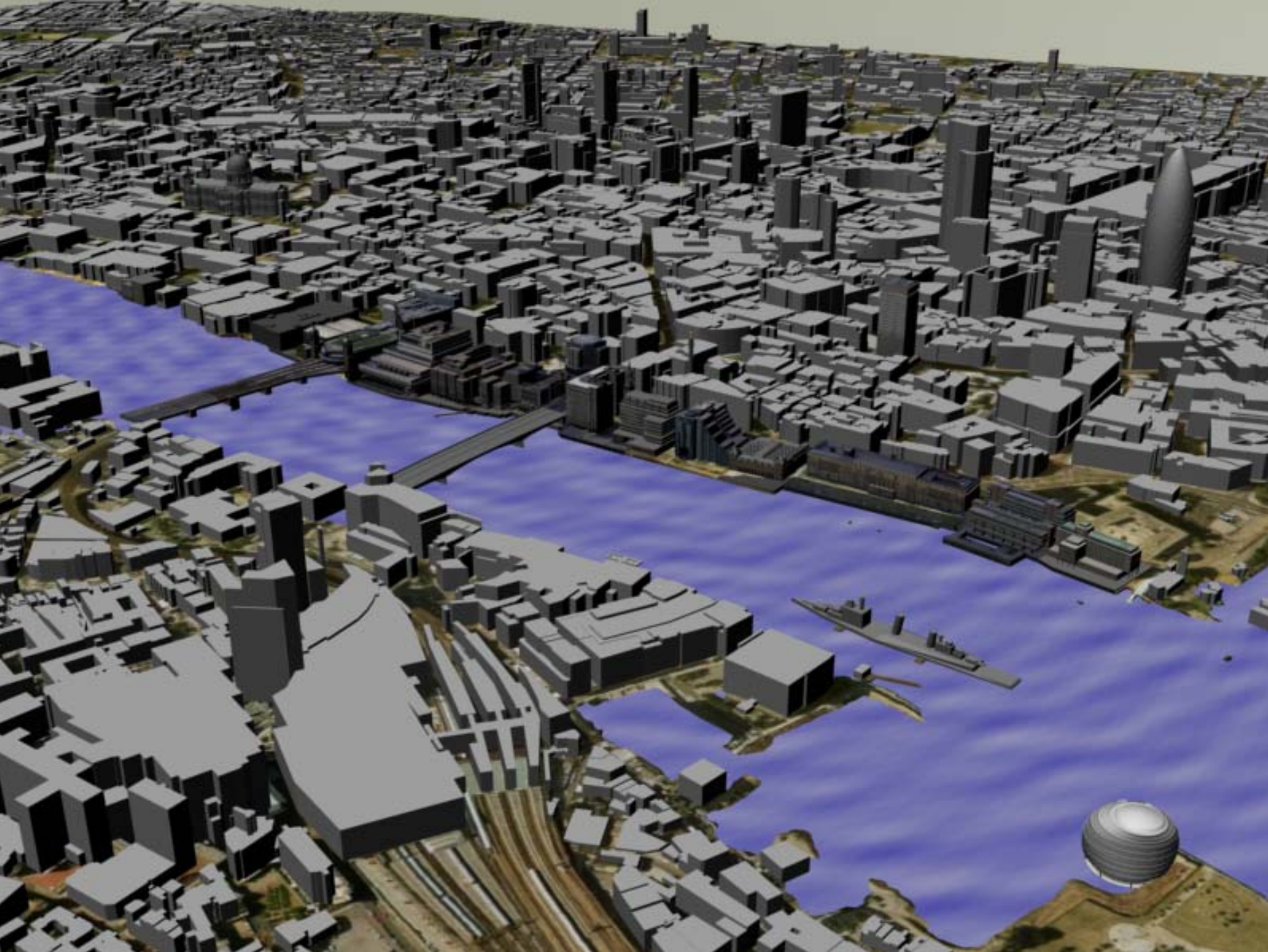
We will take a public domain ESDA package like GeoDa (Luc Anselin's package) and link it to UK data sets from the Census at MIMAS and EDINA. We will thus fashion a straightforward application of ESDA but letting users select any area of the UK at any scale and maybe across time periods (1981, 1991, 2001?) for analysis.

We may add some minimal 3D to this locally but focus will be on good user interfaces and fast access to software and data – this will be of interest because the software will be in the US at UIUC.

- *3D-GIS with Real-Time Data Sensors*

Our next demonstrator will take a standard 3D-GIS model – our virtual London model and link 3D geometry to more abstract spatial layers. These layers will in turn be linked to real time data sources, thus cementing the link from software to existing data online like census and geometry data and thence to real time sensors.

We already have a project financed by BOC on adding pollution layers to our Virtual London model – the pollution layers being modelled from real time air pollution network in London linked to a hydrodynamic model – ADMS – and visualised in 2D GIS by the Kings College Group – an example of the layers of data comes next



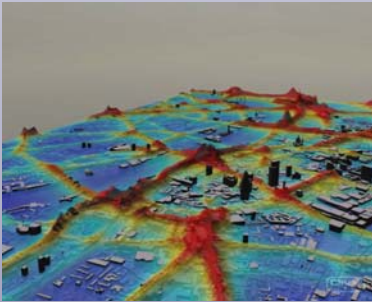
- *Constructing 3D-GIS in Real-Time*

This final demonstrator will let a user construct 3D GIS and multimedia by accessing geometry data, geographical data, and multimedia from diverse academic and some public sector sources in real time, thence building an environment of their choosing for 'any' area for which the data can be accessed – the UK ?

We may well require compute intensive net based computing to enable this – the process the number of frames required for proper display and querying and fly through – this quite frankly is the most experimental part of this entire project – we show what we would like in the following movie and we also show how we might embed very standard media within this

Let us show some of the bits that currently stand alone and simply sketch what we would like to do

First a movie of a typical fly through of our pollution layer



Second low cost multimedia easy to capture & embed in 3D

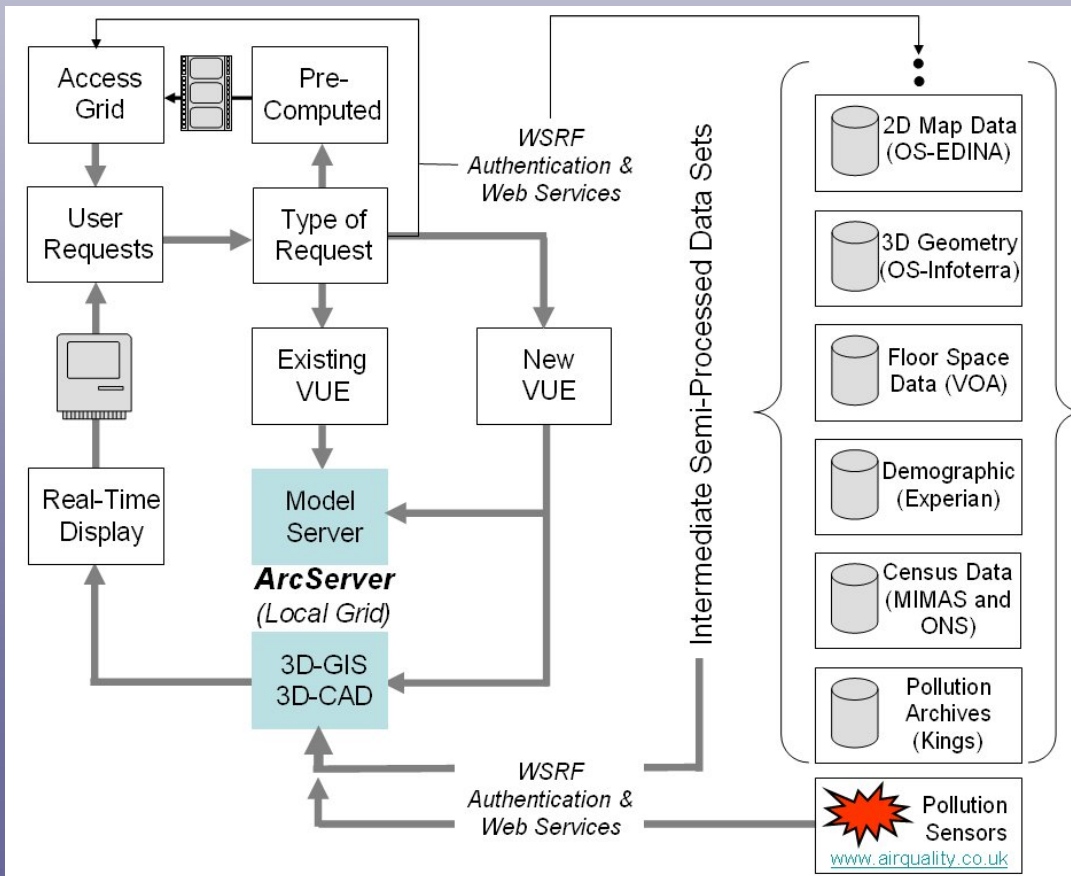


Third how we embed this media into public domain – virtually – software – Google maps, Google earth etc

<http://www.communitywalk.com/map/65>

4. A Generic Platform

We ultimately want to fashion all this in a generic platform for constructing VUEs or more specifically GeoVUEs. Here is a hackneyed sketch of what we intend.



5. Outreach

We are mandated to disseminate as we go along, hold workshops on all this and we plan to do this through Paul Longley's UCL arm of the CETL SPLINT

We also want to address some IPR issues. I am a member of the APPSI & thus have some ideas of IPR.

We also want to develop some focussed reviews of GIS and the Grid – like today's meeting with MOSES of course although our remit is a little wider

We are linked to ESRI, one of our partner, and to Google Earth and hope to keep abreast of related private sector developments.

6. Staffing, Hardware, Software, Orgware etc.

PI's – Me (Bartlett), Paul Longley (Geography), Anthony Steed (Computer Science UCL)

Andy Hudson-Smith seconded to day to day manage

Links to London Connects, ESRI

Hardware – yet to be decided, but relatively low cost – HPC in UCL – more than enough – issue is interactive access

Software – public domain like GeoDa, Open Source, freeware as far as possible, ESRI products

Orgware – middleware, virtual organizations

Links

<http://www.communitywalk.com/map/65>

<http://www.onlineplanning.org.uk/>

Andy Hudson-Smith's Blog: see above web site

<http://www.geovue.com/>

This will be our Node Web Site when it gets up and running later this year