Visualization, Analytics & Spatial Decision Support

Call for papers for the Workshop on
Visualization, Analytics & Spatial Decision Support
at the GIScience conference (September 2006, Muenster)
and for a special issue of IJGIS

The workshop aims at bringing together researchers from relevant fields to address research issues of visual analytics and spatial decision support in the multidisciplinary context of GI Science. The participants will present and discuss the state-of-the-art and directions for future research. Extended papers (subject to formal review) will be included in a special issue of International Journal of Geographical Information Science reflecting the results of the discussion.

Visual Analytics is defined as the science of analytical reasoning facilitated by interactive visual interfaces (see http://nvac.pnl.gov/agenda.stm). People use visual analytics tools and techniques to synthesize information and derive insights from massive, dynamic, ambiguous, and often conflicting data; detect the expected and discover the unexpected; provide timely, defensible, and understandable assessments; and communicate assessment effectively for action.

Spatial decision support means computerised assistance to people in the development, evaluation and selection of proper policies, plans, scenarios, projects or interventions where the problems have a geographic or spatial component. This refers to both long-term decision making (e.g. planning for sustainable places, mitigating hazards, and infrastructure planning) and short-term time-critical decisions such as emergency response and resource logistics. The spatial (and often spatio-temporal) character makes such decision problems challenging for people and demanding with respect to technologies and tools.

The goal of the workshop is to bridge the several potential connection points between research initiatives in visual analytics with the complementary research on decision support in a spatial context. Spatial decision making faces various decision complexities such as

- Spatial nature and temporal development of phenomena and processes;
- Complex multi-dimensional and heterogeneous data describing decision situations;
- Large or even huge data sets that include data in numerical, map, image, text, and other forms;
- Large number of available alternatives or a need to generate decision alternatives "on the fly" according to the changing situation;
- Multiple actors with different and often conflicting interests;
- Multiple categories of knowledge involved, including scientific (expert) knowledge and non-scientific (layman) knowledge.

Visual analytics has a clear potential to help in handling these complexities. Ongoing research efforts focus on such questions as:

- How to visualise data in a way that supports clear understanding of the problem, finding reasonable ways to solve it, seeing pros and cons of each possible solution, and understanding the tradeoffs between various options;
- How to help users to understand and properly utilise sophisticated interactive and dynamic visualisations;
- What other techniques and approaches could appropriately complement the visualisation in helping people to investigate problem situations and arrive at sound and well-grounded decisions;
- How to support knowledge and perspective sharing by teams and teams of teams;
- How to externalise and manage the knowledge gained;
- How to support visual communication of analysis results, constructed knowledge, and decisions made.

Respectively, the workshop will address various topics of visual analytics and spatial decision support, including:

- Decision-centred visual analytics;
- Visualisation support for multi-criteria decision analysis and optimization;
- Intelligent guidance in data analysis, problem solving, and decision making;
- Collaborative visualisation & participatory spatial decision making;
- Visual support for individual and team analytical reasoning and sense making;
- Methods to visualize and exploit heterogeneous information of varied quality;
- Methods for capturing observations and findings in the course of analysis, for documenting, organising, and navigating discoveries, and for supporting knowledge construction;
- Visual analytics methods for spatial and temporal data;
- Synergy of visual and computational approaches;
- Visualisation support for spatial and spatio-temporal data mining and statistics;
- Knowledge-based visualisation design;
- HCI issues of visualisation and decision support;

The workshop will have a multidisciplinary character with participation by scientists working in the areas covered by the workshop. In addition, we expect participants from neighbouring and complementary disciplines (e.g. telecartography, geocomputation, HCI, AI, cognitive science, information visualization, decision sciences) to join the workshop for establishing dialog and future cooperation. People working in application areas (e.g. disaster management, business intelligence) are encouraged to attend the workshop.

The workshop will include two invited talks (to be given by <u>Prof. M.-J.Kraak</u> and <u>Prof. D.Keim</u>), 6-8 long presentations, 6-8 short presentations, and a panel discussion. Several slots will be reserved for contributions from young scientists and PhD students. Potential workshop participants are requested to submit working papers (4-6 pages length). The working papers will be selected by organizers based on reviews provided by the workshop committee. Selection will be based on relevance to workshop topics, scientific quality, originality and innovation. The selected working papers will be posted on the workshop Web site, with the goal to facilitate the interactive character of the workshop. To promote exchange of ideas, a dedicated discussant will be appointed for each working paper. Following the discussion at the workshop, the best papers (after revision / extension and external peer review) will be published in a special issue of IJGIS.

<u>Workshop co-chairs and guest editors of the special issue:</u>

- Dr. Gennady Andrienko & Dr. Natalia Andrienko (Fraunhofer Institute AIS, Germany): http://www.ais.fraunhofer.de/and
- Prof. Piotr Jankowski (San Diego State University, USA): http://geography.sdsu.edu/People/Faculty/jankowski.html
- Prof. Alan MacEachren (Penn State University, USA): http://www.geovista.psu.edu/members/maceachren/

<u>Deadlines:</u>

Workshop web page online	1 February 2006	Full papers submitted for the review:	1 Nov 2006
Deadline for working papers:	15 May 2006	Full papers notification:	15 Dec 2006
Workshop paper notification:	1 July 2006	Final paper submitted to the editors:	14 Jan 2007
Workshop @ GIScience:	**20 Sept 2006**	Publication in IJGIS:	early 2007

Workshop homepage: http://www.ais.fraunhofer.de/and/VisA-SDS