

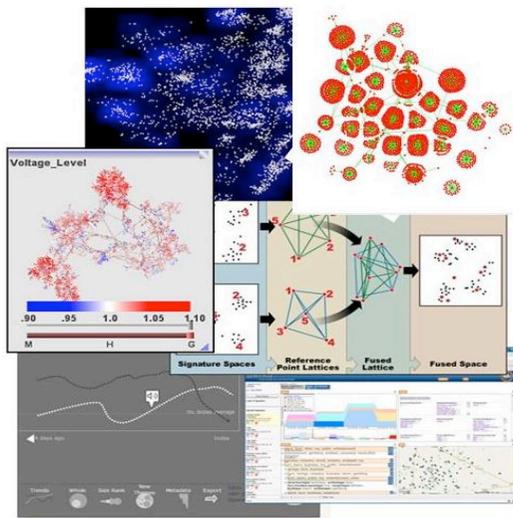


Visualisation Network of Experts

Supporting NATO IST Research Task Group, IST-085/RTG-041

Interactive Visualisation of Dynamic Networks

<http://www.visn-x.net>



11th Workshop

Visual Analytics for Network Operations and Health

29th November – 1st December 2011

Vancouver, Canada

<http://www.vacommunity.org/NATO-Vis-NX-Workshop>

Introduction

Dynamically evolving networks are ever-present in a wide variety of applications and domains, including defence, security, public health, healthcare, biomedical engineering and social policy. Understanding and maintaining these networks are essential to modern infrastructure and operations for both the civil and defence sectors, for the smooth function of everyday life and effective response to crisis situations.

The operation and health of a society encompass all of its networks' functionality, capability, stability, and robustness, as well as their ability to restructure due to contraction or expansion or such sudden challenges as national attack, hacker attack, weather disaster and epidemics. Visual Analytics provides a means to understand and analyse a network's operations and health and the implications when it is undergoing expected or unexpected changes.

This workshop will bring together operational users, developers and researchers to explore how visual technologies can support network health assessment and management for military and civil applications. Sample application domains include:

- Computer network operations and security;
- Intelligence and counter-terrorism;
- Peacekeeping and peace support operations;
- Situational awareness and decision support;
- Healthcare and emergency services;
- Public Health and communicable disease management;
- Cloud computing and
- Critical infrastructure protection.

Background

The NATO Research Task Group "Interactive Visualisation of Network Dynamics" has requested the Visualisation Network of Experts (Vis N/X) to advise it on how visual analytics can support the understanding of network operations and health. Accordingly, Vis N/X will assemble an international group of experts in the topic at a three day workshop.

Workshop objectives

This workshop is intended to bring together network scientists and those who use, manage, develop and evaluate network operations and health. This multi-disciplinary approach reflects the reality that improvement of visual analytics systems requires understanding both modifiable and non-modifiable human factors and technological innovation. A core objective is to have users interact with developers and researchers. The workshop will be a forum for commanders, managers, health planners, field personnel, academics, etc., to discuss the pros and cons of current systems in supporting network operations and health. This discussion will help guide future management of network analysis, visualisation, research and development. The workshop should identify problems for which there are currently no obvious solutions, but where solutions seem possible. Ideally, the outcome of the workshop will provide direction for the solutions development.

Workshop themes and topics

The workshop has three inter-related sub thrusts: *Social Networks*, *Physical Networks* and *Logical Networks*. It will also address questions of how and why visual analytics techniques can be best selected to address task requirements. Of particular interest are military and civil applications and problems whose dynamic nature poses threats to operations. Some sample issues can be found in the following areas:

Computer networks: Computer networks are pervasive in the application domains, and the technology is becoming more dynamic through the use of mobile devices. When a computer network falters, the effects can have severe ramifications beyond the cyber domain.

Infectious disease propagation: When the structure and health of disease propagation networks are understood, steps can be taken to prevent further propagation of an outbreak.

Counter-terrorism networks and Intelligence: Counter-terrorism activities include knowledge of the physical and social networks of terrorist groups. Understanding the operation of a terrorist network, including where the network is weak, can enhance counter-terrorism activities.

Situational awareness and decision support: Awareness of the health of a network or system of networks, (e.g. computer, social, and transportation networks) supports commanders and leaders in making informed decisions.

Selecting and matching visual analytic techniques to tasks: How can researchers, developers and users best select and design visual analytic systems so as to effectively address task requirements? How might this problem be approached formally?

End-users, technologists, human factors researchers, and others are invited to attend and present their current work, future needs, ideas and forecasts. Example of presentation topics include:

- How to match visual analytic techniques to tasks
- How to assess/evaluate visual analytic techniques
- How to compare visual analytics technique in applications
- Optimization of the human-machine interface for network data
- Trust in tools and methods
- Representation of uncertainty and reliability
- Visualisation of causative, explanatory and predictive social, geospatial and temporal relationships
- Visualisation of multi-dimensional and/or multi-layer networks
- Visualisation of network vulnerabilities and risk assessments
- Propagation of changes in one network layer on another related layer (cascading effects)
- Network analysis/discovery/prediction/evolution algorithms
- Game theory, co-operative and adversarial interaction modeling
- Frameworks for visualisation research and technology
- Discovery of hostile/friendly relationships and dispositions
- Relationship discovery from unstructured documents
- Technology overview and review (includes forecasting what civil and military needs will and will not be met in the commercial and academic sectors)
- Experience with current visualisation technologies
- Effects of stress
- Application of existing technology / case studies

Workshop format and organization

We plan an interactive workshop, consisting of sessions and working groups. Each *session* will consist of a group of a small number of selected presentations or demonstrations, followed by a plenary discussion period. The presentations/demonstrations are intended to stimulate participants for subsequent working group discussions, and will provide an extended opportunity for generating and sharing ideas with all participants. We are particularly interested in soliciting operational users to lead plenary sessions and serve as commentators.

Interdisciplinary *working groups* will be formed and their meetings interleaved with the sessions. The working groups will be arenas for in-depth discussions of specific topics allowing more people to interact and more subjects to be covered. Each participant in the workshop will be a member of a group, and each group will have participants from the various communities. These breakout discussion groups will be formed during the first day. Each group will generate a topic of mutual interest; they will discuss future directions for the topic, write a summary report, and present it at the end of the workshop.

Why attend the workshop?

This workshop will bring together both military and civilian users, practitioners, researchers and technologists, with big picture ideals blended with appropriate level of detail.

GENERAL INFORMATION

Classification

All material and discussion in this workshop will be unclassified.

Participation Requests

Potential attendees are invited to complete the attached Attendance Submission form and submit it to: papers@nato.trendpov.com. All forms received will be acknowledged.

Submission of a formal contribution

Potential attendees wishing to make a formal contribution at the workshop are asked to provide an outline of their proposed contribution with their Attendance Submission form. A wide range of contributions are encouraged including, e.g.: presentations, demonstrations, case studies, provocations.

Proposals for formal contributions are solicited on any of the listed topics, or on any other topic that illuminates any of the themes.

If you intend to make a **presentation for inclusion in the full proceedings** you will be asked to submit a paper of at least two pages and not to exceed four pages using the attached template which will be refereed before acceptance for publication. The papers will be reviewed by the Program Committee and/or invited experts, and if accepted will be considered refereed publications. The proceedings will be published online.

We also invite demonstration or video demonstrations. Video submissions should be in either European or North American DVD format (Regions 1 or 2). A one page description is required.

Requests to attend without making a formal contribution

Attendance is not conditional upon provision of a formal contribution and interested parties who wish to participate in the workshop without making a formal contribution are also welcome. However, attendance will be limited to 50 people. Those wishing to attend but without making a formal contribution should fill in their details on the attached Attendance Submission Form stating 'Attend only'.

Proposal for discussion topics

All participants are invited to identify proposed topics for breakout discussion on the Attendance Submission form.

Time schedule in 2011

July 21 Submission of Request Form and paper if applicable
Aug 21 Notification of participation and paper acceptance
Oct. 30 Programme issued

Enrollment

The Workshop Committee will generally, but not exclusively, select participants for invitation based on the material submitted, along with the Attendance Submission form.

Selection of attendees will be with a view to maximizing the opportunity for dialogue among users, developers, and researchers. The invitations and additional information material will be issued during November 2011.

Language

Presentations and discussions will be in English.

Workshop site, lodging, social programme

The workshop will be held in the British Columbia Regional Offices of the Government of Canada Offices in Vancouver. Vancouver is the largest city in British Columbia. Set between mountains and the sea, it is considered by many to be Canada's most beautiful city.

Vancouver weather in November is---don't ask!

A block booking has been reserved for workshop participants and accompanying persons at:

Pan Pacific Hotel,
300-999 Canada Place,
Vancouver, BC, V6C 3B5, Canada.

The deadline for reservations at the workshop hotel is Thursday 27th October 2011, after this date the special rate will no longer be available and there will be no guarantee of room availability.

Rates: \$129 - \$149 CAD + 15.74% tax for single and double room per night respectively. Mention: "Visualisation group block":

- Main desk for reservations at +1 604-662-3223.
- Toll-Free: 1-800-663-1515 (Canada)/ 1-800-937-1515 (USA)
- Reservations Direct Fax: 604-895-2469
- Reservations Email: reservations@panpacificvancouver.com

There is no workshop registration fee. Attendees and accompanying persons will be responsible for their own hotel costs and expenses. A non-subsidized workshop dinner is planned; other social events and site visits may also be arranged

Additional information

Questions concerning contributions or about the workshop should be addressed to workshop committee questions@nato.trendpov.com. Questions on administrative aspects should be addressed to the host nation coordinator Dr. Marcus Lem (Marcus.Lem@hc-sc.gc.ca).

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