



North Atlantic Treaty Organization
RESEARCH AND TECHNOLOGY AGENCY

CALL FOR CONTRIBUTIONS

for the WORKSHOP

Visualising Network Information

IST-063/RWS-010

a workshop organized under the
INFORMATION SYSTEMS TECHNOLOGY (IST) PANEL



to be held at the
Royal Danish Defence College
Copenhagen, Denmark
17-20 October 2006

This Workshop is not classified. It is open by invitation to participants from the NATO Nations and Partnership For Peace (PfP) Nations.

NOTE: This Workshop will not be further announced.
All wishing to be invited must submit the attached form,
Request to Participate, by 20 January 2006.

INTRODUCTION

NATO commanders, defence analysts, crisis managers, etc., visualise the networks that affect their operations. Developers produce tools to assist network visualisation. Researchers discover the concepts and methods that developers turn into tools. In this context, networks include both "structural" networks - e.g. information and service infrastructural networks - as well as "conceptual" networks - e.g. social networks which show the interactions and organizational relationships among their elements.

This workshop will bring together operational users, developers, and researchers to explore the connection between visual technologies and network analysis for military and civil protection applications. Application domains include information assurance, infrastructure protection, network defence, network-enabled activities and counter-terrorism, along with peace keeping and peace support operations.

Background

The NATO R&T Organization Task Group, IST-059/RTG-025 ("Visualisation Technology for Network Analysis"), has been tasked with ascertaining the state of the art for network data presentation in various problem domains, determining the role and value of the underlying technology, and identifying promising technologies for visualising network information to support effective analysis (for more information, see <http://www.vistg.net>). In support of its mandate, the RTG initiated this latest in a series of bi-annual workshops addressing various aspects of information visualisation. In each of the previous two workshops — September 2002, "Massive Military Data Fusion and Visualisation: Users Talk with Developers" (IST-036/RWS-005), and September 2004, "Visualisation and the Common Operational Picture (COP)" (IST-043/RWS-006) — military officers and operators conducted problem-oriented discussions with visualisation researchers and system developers, in plenary sessions and in small focused working groups, to identify issues and recommend fruitful areas for research. Using the same proven methods, this workshop will investigate how presentation technologies can be optimised for effective network visualisation.

Workshop objectives

This workshop is intended to bring together those who use network analysis system, those who develop them, and those who make the systems more usable and effective. A core objective is to have users *talk with* developers and researchers. The workshop will be a forum for commanders and staff officers to describe the pros and cons of current systems supporting network visualisation, which should help guide future military visualisation and research and development. The aim is to be multidisciplinary since both human factors and technological innovation collaborate in improving visualisation systems. The workshop should identify problems to which there are as yet no solutions, but where solutions seem possible.

Workshop themes and topics

The workshop will have three interrelated major themes: *Military and Civil Protection Applications*, *Human Factors*, and *Technology*. Possible topics within the three major themes include:

Military and Civil Protection Applications:

- Network-enabled operations
- Counter-terrorism
- Peace keeping and peace support operations
- Social networks
- Hostile/Friendly relationships and dispositions
- Visualisation of infrastructure network vulnerabilities and risk assessments
- Relationship discovery from unstructured documents

Human Factors

- Effects of Stress
- Optimisation for network data of the human-machine interface
- Visualising geospatial and temporal relationships
- Presentation of multi-dimensional relationships
- Representation of uncertainty and reliability
- Trust in tools and methods
- Experience with Current Visualisation Technologies
- Situation Awareness and Decision Support

Technology

- Network analysis/discovery algorithms
- Game theory, co-operative and adversarial interaction modelling
- Investigation products
- Application of existing technology
- Technology Overview and Review (includes forecasting what military needs will and will not be met in the private and academic sectors).

Workshop format and organisation

We plan an interactive workshop, consisting of sessions and working groups. Each *session* will consist of a group of several presentations/demonstrations, followed by a plenary discussion period. The presentations/demonstrations are intended to stimulate participants for the subsequent discussion, and will provide an extended opportunity for ideas to be aired before all participants, with the possibility that those ideas may be refined in the working group discussions. 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. Groups will be formed during the first day, and each will have a moderator and a reporter. Each group will generate a topic of mutual interest, discuss future directions for the topic, write a summary report, and present it at the end of the workshop.

Why attend the workshop?

"At this workshop, military and civil protection personnel will discover that research on network visualisation shows that what they have been doing is essentially correct. Similarly, researchers will discover that their research is aimed precisely at military and civil protection network visualisation requirements. Finally, developers will discover that they are using correct principles to provide network visualisation tools to serve the operators' purposes."

If the world were like that, there would be no need for this workshop.

Why would military and civil protection personnel want to attend?

Operational participants will collaborate directly with researchers and developers in network visualisation to learn what capabilities are available and to influence the research and development.

Why would human factors and technology researchers want to attend?

This workshop will provide human factors and technology researchers in visualisation with a unique forum for understanding the tasks and needs of defence and civil system users under operational conditions. Researchers will also see examples of newly-developed visualisation systems for supporting network analysis and understanding.

Why would system developers and consultants want to attend?

System developers will have the opportunity to demonstrate their latest technological achievements to a highly interested audience including military and crisis management personnel. Developers can describe current and anticipated capabilities of new technology along with its possibilities and limitations. Technical ideas and demonstrations will inspire the other communities, while developers and consultants may be inspired to focus on solutions useful for systems under realistic circumstances.

GENERAL INFORMATION

Classification

No material and discussion in this workshop will be classified. Since the workshop site is at a military establishment, a security procedure will be necessary to gain admission. This will be detailed in the workshop invitation.

Who may attend and contribute?

This workshop is open by invitation to participants from NATO countries, NATO agencies and Partnership for Peace (PfP) Nations. Prospective participants should request an invitation in accordance with the submission requirements below. All participants are expected to contribute actively to the discussions that will be the core of the workshop, and some will be invited to make presentations, be moderators at a plenary session, or to act as session chairs. **We are especially interested in the participation of operational personnel to serve as commentators or discussants.** To ensure effective interaction, attendance is by invitation and numbers will be limited.

Submission requirements

All wishing to participate should fill in the enclosed **Contribution Submission Form** and send it to the Host Nation Co-ordinator (lr@ddre.dk). If possible, electronic communication is preferred. Proposals for presentations, discussion topics, case studies, demonstrations, and so forth, are solicited on any of the listed topics, or on any other topic that illuminates any of the three themes. Each author must complete the enclosed **Presentation Publication Release Clearance Form 13 (E)**.

To request an invitation please submit the form, Request for Invitation, which includes space for supporting material such as a short abstract. This will allow the program committee to assess the nature of your contribution to the workshop.

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 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. Accepted appropriate submission material including pre-refereed papers will be published in a pre-proceedings, and the refereed papers along with presentations will be published in electronic format in the full proceedings.

If preparing a paper for publication in the full proceedings, please follow the instructions in the enclosed **Notes for Authors and Editors of RTO Publications** document. This is also available for download from the RTO website at: <http://www.rta.nato.int/download.htm>

Participants from the UK and US: See procedure in the Request to Participate and Presentation Publication Release Clearance Forms (F13).

We also invite video demonstrations from developers. Video submissions should be in either European or North American DVD format (Regions 1 or 2).

Time schedule in 2006

January 20	Deadline for submitting Request to Participate forms
February 17	Notifications of participation sent out
March 31	Deadline for US and UK authors to submit papers and Presentation Publication Release Clearance Form to their national points of contact
April 28	Deadline for non-US/UK authors to submit papers and Presentation Publication Release Clearance Form to the workshop co-ordinator
June 30	Referee comments returned
July 28	Draft program issued
September	Pre-proceedings available
October	Final Program e-mail distribution
October 10	Deadline for final paper submissions and NATO release form F13
October 17-20	Workshop

Enrollment

The Workshop Committee will generally, but not exclusively, select participants for invitation based on the material submitted, along with the **Contribution Submission Form**. Selection will be done with a view to maximizing the opportunity for dialogue among users, developers, and researchers. The invitations and additional information material will be issued during February 2006.

Please contact the host nation co-ordinators regarding administrative aspects of the workshop. Address lists are found below.

Language

All presentations and discussions will be in English.

Deliverables

Workshop participants will receive a standard NATO RTO Proceedings on CD-ROM to be published as soon as possible after the workshop. Additional material on the CD, such as live demonstrations, may be included depending on the availability of materials from participants and discussion reporters.

Workshop site, lodging, social program

The workshop will be held at the Royal Danish Defence College, Copenhagen, Denmark. Copenhagen is the capital of Denmark, and 1.7 million live in the Greater Copenhagen Area. It has a one thousand-year history written by ambitious kings, inspiring artists and celebrated designers awaits you in the medieval streets, 17th-century canals and modernist architecture of Copenhagen. From its origin as a humble fishing village to its heyday as the glittering capital of the Danish empire, to its current position as one of the world's premier design capitals and Scandinavia's pre-eminent city, the stories and characters of Copenhagen's history are there to be discovered in its sumptuous palaces, copper-roofed town houses and atmospheric cobbled squares. Copenhagen has a major international airport with excellent flight connections. Copenhagen weather in October is very changeable. It can be both warm and cold. It can also be windy and wet. The average day temperature is 12.1 C (53.78 F) and the night temperature 6.7 C (44.06 F). The average amount of rain for the month is 56 mm, and the average amount of sun hours is 90. Further information can be obtained at http://www.visitcopenhagen.dk/show.asp?id=1#Scene_1.

The Royal Danish Defence College is the Danish armed forces' powerhouse for education, training and research-generated consultancy. The College offers a wide variety of courses and consultancy activities that cannot be found elsewhere in Denmark. Most of the activities are aimed at the commands and institutions of the Danish armed forces in order to enhance the ability of the Danish armed forces to carry out international and national missions. However a few courses are also offered to civilians. Today the college comprises the headquarters, three faculties, four centers and three libraries. The College is located a little to the north of the centre of Copenhagen with easy access to the subway and several busses. Further information can be obtained at <http://www.fak.dk/Default.asp?ID=584>.

Workshop participants and accompanying persons will be invited to stay in hotel accommodations near the centre of Copenhagen. Hotel rates will be in accordance with the rates for the Danish Defence. Workshop organizers will arrange a block booking at the hotel. Hotel information will be provided on the workshop invitation.

Because there will be no workshop fee, participants will be responsible for the costs of their own meals, with the exception of one lunch. Lunches will be available at the meeting site. A non-subsidised workshop dinner is also planned. Further information will be sent along with the invitations. (Other social events and site visits may also be included).

Additional information

Questions concerning contributions or about the workshop in general should be addressed to members of the workshop committee. Questions on administrative aspects should be addressed to the host nation co-ordinator. Questions about formal publication issues or general RTA activities should be addressed to the IST Panel Executive or Assistant. All addresses are found below.

PROGRAMME COMMITTEE

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NATO's Research & Technology Organisation (RTO)

RTO is the single focus in NATO for Defence Research and Technology activities. Its mission is to conduct and promote co-operative research and information exchange. The objective is to support the development and effective use of national defence research and technology and to meet the military needs of the Alliance, to maintain a technological lead, and to provide advice to NATO and national decision-makers. The RTO performs its mission with the support of an extensive network of national experts. It also ensures effective co-ordination with other NATO bodies involved in R&T activities.

RTO reports both to the Military Committee of NATO and to the Conference of National Armament Directors. It comprises a Research and Technology Board as the highest level of national representation and the Research and Technology Agency (RTA), a dedicated staff with its headquarters in Neuilly, near Paris, France. In order to facilitate contacts with the military users and other NATO activities, a small part of the RTA staff is located in NATO Headquarters in Brussels. The Brussels staff also co-ordinates RTO's co-operation with nations in Middle and Eastern Europe, to which RTO attaches particular importance especially as working together in the field of research is one of the more promising areas of initial co-operation.

The total spectrum of R&T activities is covered by the seven panels, dealing with:

AVT: Applied Vehicle Technology	SAS: Studies, Analysis & Simulation
HFM: Human Factors & Medicine	SCI: Systems Concepts & Integration
IST: Information Systems Technology	SET: Sensors & Electronics Technology
MSG: Modelling & Simulation	

These panels are made up of national representatives as well as generally recognised 'world class' scientists. The Panels also provide a communication link to military users and other NATO bodies. RTO's scientific and technological work is carried out by Technical Teams, created for specific activities and with a specific duration. Such Technical Teams can organise workshops, symposia, field trials, lecture series and training courses. An important function of these Technical Teams is to ensure the continuity of the expert networks.

RTO builds upon earlier co-operation in defence research and technology as set-up under the Advisory Group for Aerospace Research and Development (AGARD) and the Defence Research Group (DRG). AGARD and the DRG share common roots in that they were both established at the initiative of Dr. Theodore von Kármán, a leading aerospace scientist, who early on recognised the importance of scientific support for the Allied Armed Forces. RTO is capitalising on these common roots in order to provide the Alliance and the NATO nations with a strong scientific and technological basis that will guarantee a solid base for the future.

The Information Systems Technology Panel (IST) covers the fields of:

- (a) Information Warfare and Assurance,
- (b) Information and Knowledge Management,
- (c) Communications and Networks,
- (d) Architecture and Enabling Technologies.

The IST-Panel has various Research Task Groups. IST-059/RTG-025 "**Visualisation Technology for Network Analysis**" is responsible for organising the workshop on **Visualising Network Information**.