

NORTH ATLANTIC TREATY ORGANIZATION



RESEARCH AND TECHNOLOGY ORGANIZATION

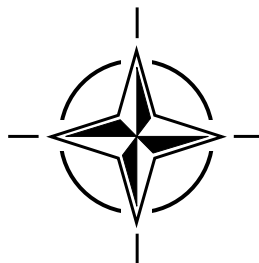
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RTO MEETING PROCEEDINGS 71

The Second NATO Modelling and Simulation Conference

(Deuxième conférence OTAN sur la modélisation et la simulation)

Papers presented at the NATO Modelling and Simulation Group (NMSG) Conference held in Shrivenham, UK, 24-26 October 2000.



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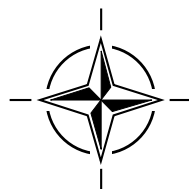
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The Research and Technology Organization (RTO) of NATO

RTO is the single focus in NATO for Defence Research and Technology activities. Its mission is to conduct and promote cooperative 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 coordination 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 (RTB) 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 coordinates RTO's cooperation 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 cooperation.

The total spectrum of R&T activities is covered by the following 7 bodies:

- AVT Applied Vehicle Technology Panel
- HFM Human Factors and Medicine Panel
- IST Information Systems Technology Panel
- NMSG NATO Modelling and Simulation Group
- SAS Studies, Analysis and Simulation Panel
- SCI Systems Concepts and Integration Panel
- SET Sensors and Electronics Technology Panel

These bodies are made up of national representatives as well as generally recognised 'world class' scientists. They 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 cooperation 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.

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The Second NATO Modelling and Simulation Conference

(RTO MP-071 / NMSG-010)

Executive Summary

The creation of the new NATO organisation for Modelling and Simulation was approved by the NAC, in 1998. This organisation was set up within the R&T organisation and consists of a NATO Modelling and Simulation Group (NMSG) reporting to the RTB, supported by a permanent office installed in RTA (Neuilly, France): the Modelling and Simulation Coordination Office (MSCO). The NMSG activity is undertaken according to an "Action plan" approved by the RTB and revised annually. This action plan requires the organisation of an annual M&S conference, in order to leverage the general knowledge of NATO and PfP nations members and to facilitate cultural and technical exchanges on this relatively new M&S topic for NATO.

The second RTA NATO Modelling and Simulation Conference was hosted by the UK MOD, in conjunction with the 3rd International Synthetic Environment Conference (ISEC), and was held at the Royal Military College of Science at Shrivenham 24 to 26 October 2000.

The Conference presented a series of papers during plenary sessions designed to provide an overview of NATO M&S current best practices, standards, interoperability and reuse. The Conference also provided information on NATO M&S policy, and new M&S activities within the Alliance. In addition the Conference also addressed themes of research, development and the application of Synthetic Environments.

The main objectives selected for the Conference were the following:

1. Provide a forum to present and discuss NATO M&S best practice and policy,
2. Provide an overview of current and future NATO M&S activities pertaining to both the development and employment of M&S, to include impact assessments and lessons-learned,
3. Present briefings on the latest M&S-related technology developments, relating to NATO Research and Technology Organisation (RTO) activities and those emerging elsewhere,
4. Discuss updates on M&S-related standards activities (including both NATO Standards Agreements and commercial standards),
5. Provide a forum to present research, development and the application of Synthetic Environments.

The conference was organised in 6 sessions: 25 papers or presentations were provided. Many enriching questions and discussions were raised and the audience expressed its satisfaction with the high standard of papers and presentations. The proceedings contains a technical evaluation of the conference, copies of published papers and, exceptionally when papers were not available, a copy of the presentation.

Key outcomes and conclusions from the Conference were:

- a. The importance of M&S within NATO remains high. SACLANT reaffirmed that M&S will provide strong support in the key areas of defence planning, training & exercises, support in military operations and in CDE (Concept Development and Experimentation).
- b. It was generally accepted that Synthetic Environments and M&S will be successfully applied to equipment capability and operational support & training, but their application to real-time decision making (defence policy, programmes and balance of investments) will be a more difficult and longer-term problem.

- c. The first NATO Federation of simulations (the Distributed Multi-National Defence Simulations - DiMuNDS 2000 Project) was successfully demonstrated at the Conference. This impressed attendees by the demonstrative impact of the federation of simulations and the prospect it provided for future Computer Assisted Exercising (CAX) capabilities to support, in particular, the NATO CJTF.
- d. The Synthetic Environment Data Representation and Interchange Standard (SEDRIS™) that provides the means to represent environmental data (terrain, ocean, air and space), and promote the unambiguous, loss-less and non-proprietary interchange of environmental data is becoming more widely used within the M&S community and is now likely to be recommended as a NATO STANAG.
- e. The integration of human behaviour at different levels within simulations will remain a very difficult problem and challenge for the M&S community.
- f. Major General A C Figgures, Capability Manager (Manoeuvre) UK MOD, provided the Conference with a fitting end message encouraging the SE and M&S community “to continue their efforts, without forgetting the primary objectives of providing military personnel with effective, affordable SEs which are also credible to military and scrutiny staffs. SEs must be led by Customer *pull* and not by Technology *push*”.

Deuxième conférence OTAN sur la modélisation et la simulation

(RTO MP-071 / NMSG-010)

Synthèse

La création d'un nouvel organisme OTAN de modélisation et simulation (M&S) a été approuvée par le NAC en 1998. Cet organisme a été créé au sein de l'Organisation pour la recherche et la technologie de l'OTAN (RTO) et consiste en un Groupe OTAN de modélisation et simulation (NMSG) qui rend compte au RTB et qui dispose d'un bureau permanent dans les locaux de la RTA à Neuilly (France) : le bureau de coordination des activités OTAN de modélisation et simulation (MSCO). Les activités du NMSG sont entreprises dans le cadre d'un "Plan d'action" approuvé par le RTB et revu tous les ans. Ce plan d'action prévoit l'organisation d'une conférence M&S annuelle, qui a pour objectif de sensibiliser les pays membres de l'OTAN ainsi que les pays du PpP à ce sujet relativement nouveau pour l'OTAN, ainsi que de faciliter les échanges culturels et techniques dans ce domaine.

La deuxième conférence RTA/OTAN sur la modélisation et la simulation a été organisée par le Ministère de la Défense du Royaume-Uni, conjointement avec la 3ème Conférence Internationale sur les Environnements Synthétiques (ISEC) au Royal Military College of Science de Shrivenham du 24 au 26 octobre 2000.

Lors des séances plénières, la conférence donna lieu à une série de communications offrant un aperçu des meilleures pratiques actuelles, des normes, de l'interopérabilité et de la réutilisation de la M&S dans l'OTAN. Elle a également apporté des informations sur la politique de l'OTAN en matière de M&S, ainsi que des nouvelles activités de modélisation et simulation au sein de l'Alliance. En outre, les thèmes de la recherche, du développement et de l'utilisation des environnements synthétiques ont été abordés.

Les principaux objectifs de la conférence étaient les suivants :

1. Offrir un forum pour la présentation et la discussion des meilleures pratiques et de la politique de l'OTAN en matière de M&S.
2. Donner un aperçu des activités M&S actuelles et futures de l'OTAN concernant le développement et la mise en œuvre de la M&S, y compris l'évaluation de sa portée et les enseignements déjà tirés.
3. Présenter des briefings sur les derniers développements dans le domaine des technologies de modélisation-simulation en relation avec les activités de l'Organisation pour la recherche et technologie de l'OTAN (RTO), ainsi qu'avec toutes autres activités émergentes.
4. Discuter des mises à jour des normes dans le domaine de la M&S (comprenant à la fois toutes les STANAGs et les normes commerciales).
5. Présenter un forum pour la recherche, le développement et la mise en œuvre des environnements synthétiques.

Le symposium a été organisé en six sessions : 25 différentes communications ont été présentées. Bon nombre de questions intéressantes ont été soulevées et des discussions fructueuses ont eu lieu. Les participants ont exprimé leur satisfaction devant le haut niveau des communications et des présentations. Le compte rendu de la conférence contient une évaluation technique de la conférence, des copies de communications ayant été publiées et, exceptionnellement, en cas de non-disponibilité des communications, des photocopies des présentations.

Les résultats et conclusions principales de la conférence furent :

- a. La M&S présente toujours un grand intérêt pour l'OTAN. Le SACLANT a réaffirmé l'importance du soutien qui sera fourni par la M&S dans les domaines clés que sont la planification de la défense, l'entraînement et les exercices, le soutien des opérations militaires et l'activité CDE (développement de concept et expérimentation).
- b. Il a été généralement admis que les environnements synthétiques (SE) et la M&S pourront être appliqués avec succès au soutien des opérations et à l'entraînement, ainsi qu'à l'amélioration des capacités des équipements, mais que leur mise en œuvre pour la prise de décisions en temps réel (politique de défense, programmes, équilibre des investissements) s'avérera plus difficile et plus longue à réaliser.
- c. La première fédération de simulateurs de l'OTAN (le projet de simulations réparties de défense multinationale - DiMuNDS 2000) a été présentée avec succès lors de la conférence. Les participants ont été impressionnés par l'impact de cette "fédération", ainsi que par la perspective qu'elle fournit pour les exercices assistés par ordinateur (CAX) en particulier pour le soutien des opérations GFIM de l'OTAN.
- d. La norme relative aux données pour la représentation et les échanges de données sur l'environnement synthétique (SEDRIS™) qui permet de représenter des données environnementales (terrestres, maritimes, aériennes et spatiales) et de promouvoir des échanges sans pertes et exclusives de données environnementales, est de plus en plus utilisée par la communauté M&S et pourrait devenir un STANAG OTAN.
- e. L'intégration du comportement humain à des niveaux différents dans les simulations demeurera un problème très difficile et un défi pour la communauté de la M&S.
- f. Le Major General A C Figgures, responsable Capacités (Manœuvres) au ministère de la Défense britannique, a prononcé un discours de conclusion très adapté dans lequel il a encouragé les communautés SE et M&S à "poursuivre leurs efforts, sans oublier les objectifs prioritaires qui sont de fournir aux militaires des environnements synthétiques efficaces et abordables qui soient acceptables à la fois pour les militaires et les vérificateurs. Les SE doivent progresser sous l'impulsion de la demande de la clientèle et non sous l'effet de la poussée technologique".

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† Paper not available at time of production.

Foreword

Following the success of the first NATO RTA Modelling and Simulation Conference held in Norfolk, USA in October 1999, a second Modelling and Simulation Conference was held in the UK over the period 24 to 26 October 2000. It was hosted by the UK Ministry of Defence and the Royal Military College of Science at Shrivenham in the UK and was held in conjunction with the International Synthetic Environment Conference. The Conference had the themes of modelling and simulation interoperability, the NATO M&S Master/Action Plan, simulation policy, new M&S activities within the Alliance and Synthetic Environments.

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