

Science & Technology Organization
Collaboration Support Office
Applied Vehicle Technology Panel

AVT-308 Cooperative Demonstration of Technology on Next-Generation NATO Reference Mobility Model Development

Houghton, Michigan, USA

September 25th to 27th 2018

This Collaborative Demonstration of Technology is open to NATO Nations, Australia, Finland, Sweden, Japan, Republic of Korea and South Africa.

Theme and Topics

When mobility predictions get it wrong, vehicles become immobilized, putting the soldiers at risk and jeopardizing mission success. Leveraging the most advanced physics models and modern computing power, Next-Generation NATO Reference Mobility Model (NG-NRMM) will improve our capability to predict the mobility of ground platforms over a wide range of terrains.

NATO's Applied Vehicle Technology (AVT) Panel formed Research Task Group AVT-248 to develop a NG-NRMM. The NG-NRMM has the potential to significantly reduce procurement risks enabling alternative solutions to be considered. Secondly, it will provide operational decision makers with a tool for assessing their own and opposing vehicle mobility in the area of operations, which will increase confidence in mission planning and reduce the risk of mission failures due to compromised vehicles. The end result that will be demonstrated at the Collaborative Demonstration of Technology (CDT) event is a prototype process of loosely integrated technologies and tools contributed by the committee members and software developers.

- The purpose of the CDT is to demonstrate the enhanced mobility prediction capabilities of NG-NRMM vs. NRMM.
- Attendees will be introduced to the NG-NRMM technologies through a variety of presentations and demonstrations, where the differences with current NRMM will be highlighted.
- Participants will experience a physical demonstration of a military prototype vehicle performing select mobility tests in a variety of soil conditions and see the corresponding software simulation of the same tests with NG-NRMM and NRMM.

Background

The mission of the Science & Technology Organization is to conduct and promote co-operative research and information exchange. STO consists of a three level organization: the Science and Technology Board, the Panels and the Technical Teams. The AVT Panel, comprising more than 1000 scientists and engineers, strives to improve the performance, reliability, affordability, and safety of vehicles through advancement of appropriate technologies. The Panel addresses platform technologies for vehicles operating in all domains (land, sea, air, and space), for both new and ageing systems.

For participation in this Meeting, please enroll online at the STO Events Website: <http://events.sto.nato.int>

Once your enrollment has been validated, you will be able to download a CDT brochure giving you further necessary details about the meeting.

Enrollment Deadline: 31 August 2018

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Program

Monday 24 September 2018, DAY 0
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1500-1800	Registration and Social	<i>Rozsa Center for the Performing Arts</i>
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Tuesday, 25 September 2018, DAY 1	Theme: Technology
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0730	Registration and Transport to <i>Tent Site</i>	<i>KRC Main Building</i>
0830	Safety / Logistics Information	Scott Bradley
0845	Welcome	Jay Meldrum
0900	NATO Task Group and CDT Objective	Michael Hoenlinger
0945 **	Break	
1045 **	NG-NRMM Virtual and Physical Demonstration Plan	Ole Balling / Scott Bradley
1145 **	Thrust 1: Geospatial Terrain and Mobility Mapping	Matt Funk / Ryan Williams / Russ Alger
1230 **	Lunch	
1330 **	NG-NRMM Physical Demo / Walk-Around or Visit Booths	Scott Bradley, Lead
1530 **	Break	
1600 **	Thrust 2: Simple Terramechanics Model & Data	Michael McCullough
1645 **	Thrust 3: Complex Terramechanics Model & Data	Tamer Wasfy
1730	Summary and Tomorrow's Preview	Richard Gerth
1800	Transport to <i>KRC Main Building</i>	

Wednesday, 26 September 2018, DAY 2	Theme: Operational Scenario
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0730	Registration and Transport to <i>Tent Site</i>	<i>KRC Main Building</i>
0830	Safety Brief	Jay Meldrum
0845	NATO Welcome	Christoph Mueller
0900	US DOD Welcome	Philip Perconti
0915	TARDEC Welcome	Paul Rogers
0930 **	History, Motivation, and Goals for NG-NRMM	David Gorsich
1000 **	Break	
1030 **	NG-NRMM Physical Demo / Walk-Around or Visit Booths	Scott Bradley, Lead
1230 **	Lunch	
1330 **	NG-NRMM Virtual Demonstration	Radu Serban, Lead
1500 **	Break	
1545	CDT Results and Vision for the Future	William Mayda
1630	Transport to <i>KRC Main Building</i>	
1800	Cocktail Hour	<i>Memorial Union Ballroom</i>
1900	Dinner Reception	
	After-Dinner Speaker	Richard Koubek, President, MTU

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Thursday, 27 September 2018, Day 3		Theme: Future
0800	Registration and Transport to <i>Tent Site</i>	<i>KRC Main Building</i>
0900	Review of First Two Days and Plans for Today	Paramsothy Jayakumar
0930	Thrust 5: Uncertainty & Stochastic Mobility Maps	Nick Gaul / KK Choi
1015 **	Break	
1045 **	Thrust 6: NG-NRMM Verification and Validation	Ole Balling / Frederik Homaa
1145 **	NG-NRMM Standard	Michael McCullough
1215 **	Lunch	
1315	Software Developer Presentations	
	MSC	Military Vehicle Simulation with <i>Adams</i> : Mobility and Beyond
	CSIR	South African Mobility Prediction Software <i>MOBSIM</i>
	CM Labs	Real-Time Vehicle Simulation using <i>Vortex Studio</i>
	VSDC	Wheeled Vehicle Mobility Prediction using <i>NWVPM</i>
	AU	<i>ROAMS</i> , a Fast Running Mobility Simulator Utilizing GeoTIFF Terrain Maps
	ASA	<i>DIS</i> – A Complex Terramechanics Software Tool for Predicting Vehicle Mobility
1515	Break	
1545	Thrust 7: Gaps and Path Forward	Michael Bradbury / P. Jayakumar
1630	Open Discussion	All
1700	Conclusion of CDT; Transport to <i>KRC Main Building</i>	

** *sign-up times available for traverse and terrain ride-alongs*

Other Activities:

Traverse Ride-Alongs: Sign-in Sheet

Terrain Ride-Alongs: Sign-in Sheet

Exhibitor Booths

Soil Testing Exhibit

MSC Simulator in KRC Main Building

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Science and Technology Organization in NATO

In NATO, Science & Technology (S&T) is defined as the selective and rigorous generation and application of state-of-the-art, validated knowledge for defence and security purposes. S&T activities embrace scientific research, technology development, transition, application and field-testing, experimentation and a range of related scientific activities that include systems engineering, operational research and analysis, synthesis, integration and validation of knowledge derived through the scientific method.

In NATO, S&T is addressed using different business models:

- The Collaborative business model where NATO provides a forum where NATO Nations and partner Nations elect to use their national resources to define, conduct and promote cooperative research and information exchange.
- The In-House delivery business model where S&T activities are conducted in a NATO dedicated executive body, having its own personnel, capabilities and infrastructure.

The Science and Technology Organization - STO

The mission of the NATO STO is to help position the Nations' and NATO's S&T investments as a strategic enabler of the knowledge and technology advantage for the defence and security posture of NATO Nations and partner Nations, by:

- Conducting and promoting S&T activities that augment and leverage the capabilities and programmes of the Alliance, of the NATO Nations and the partner Nations, in support of NATO's objectives;
- Contributing to NATO's ability to enable and influence security- and defence-related capability development and threat mitigation in NATO Nations and partner Nations, in accordance with NATO policies;
- Supporting decision-making in the NATO Nations and NATO.

Enrollment

If you are interested in attending the CDT online enrollment is mandatory before 31st of August 2018. Please go to <http://events.sto.nato.int> / Upcoming Event Timeline. Under "Cooperative Demonstration of Technology - Next-Generation NATO Reference Mobility Model Development" (below the STO Events blue button), select **Book now**.

The **Registration Window** should appear on your screen. In the first step, please fill in your credentials. Please select your role at this meeting. If you are a member of the CDT through the NATO AVT or an Instructor please select 'Technical Team Member'. As a participant of the CDT please select the role 'Guest'. Please enter your credentials and select the days including the social events of the CDT you plan to attend. Finally, select **Next** to continue.

The second registration window should appear on your screen. Please check your credentials. If they are correct, please enter the captcha and select **Book**. An automatic email will be created that confirms that your request was successful. However, all participants are checked by their national authorities first before they receive a confirmation of the booking. Hence, until you receive confirmation from NATO CSO that your registration has been approved, you are **not allowed** to participate in the CDT.

Note: all attendees MUST bring proof of citizenship, with photo ID (passport or a driver's license w/birth certificate)



AVT-308 Collaborative Demonstration of Technology

Acknowledgement

The Applied Vehicle Technology Panel expresses its thanks to the United States for the invitation to hold this demonstration in Houghton, Michigan and for the facilities and personnel, which make this meeting possible.