



8<sup>th</sup> Knowledge Systems for Coalition Operations 2016

21<sup>st</sup> International  
Command and Control  
Research and Technology Symposium  
6-8 September – London, UK

2016

## C2 in a Complex Connected Battlespace



International Command and Control Institute



 Defence Research and Development Canada    Recherche et développement pour la défense Canada

Canada 



*QinetiQ*

# ICCRTS-KSCO-2016

## C2 in a Complex Connected Battlespace

### 21<sup>st</sup> ICCRTS-2016

- ▶ A forum for discussion of coalition and collective C2 issues and for examining the complex endeavours involving a variety of entities including military, civilian, government, international organizations.
- ▶ UK Events: 1996; 2006; 2016



Dr David Alberts

### 8<sup>th</sup> KSCO-2016

- ▶ An international working group exploring research in Knowledge-based Systems and Information Management, with a focus on the challenges of Coalition Operations.
- ▶ UK events: 1999; 2009; 2016



Prof Austin Tate

# Program Overview

- ▶ 13 countries represented
- ▶ 61 reviewed papers
- ▶ 3 keynote presentations
- ▶ 5 panel sessions

**06-Sep-16****Location: Turing Lecture Theatre**

09:45-10:00

Introduction : Professor Jitu Patel, Dstl, UK; David Albert, IDA, USA

10:00-10:20

Welcome: VAdm Duncan Potts, Director General Joint Force Development

10:20-11:00

Keynote: 21st Century Missions and their Challenges : Lt Gen Sir David Capewell

11:00-11:30

**BREAK (Riverside Foyer)**

11:30-13:00

Panel: The Complex Enterprise – Inter-agency Collaboration (Moderator: Professor Austin Tate)

**13:00-14:00****LUNCH (Riverside Foyer)**

14:00-15:30

Panel: Is our approach to C2 fit for purpose? (Moderator: Lt Gen Sir David Capewell)

15:30-16:00

**BREAK (Riverside Foyer)****Turing Lecture Theatre****Riverside 5****Riverside 4****Riverside 1**

16:00-18:00

4

C2 concepts

4

Metho-Exp-Ass

4

Socio-technical

4

BSM

18:00-20:00

**Reception (Maxwell Library, IET Savoy Place)****07-Sep-16****Location: Turing Lecture Theatre**

09:00-10:00

Keynote: Cybersecurity and the Complex, Connected Battlefield: Richard A. Hale, DOD, USA

10:00-11:00

Keynote: C2 Theory - Overview, Recent Developments, and Applications: Dr. David S. Alberts, USA

10:30-11:00

**BREAK (Riverside Foyer)**

11:30-12:30

Panel: C2 and the Challenges of the Complex Environment (Moderator: Anthony Alston, QinetiQ)

**12:30-13:30****LUNCH (Riverside Foyer)****Turing Lecture Theatre****Riverside 5****Riverside 4****Riverside 1**

13:30-15:00

2

KSCO

3

Interoperability

3

Autonomy IoT

3

BSM

15:00-15:30

**BREAK (Riverside Foyer)**

15:30-17:00

3

KSCO

3

Interoperability

3

Socio-technical

3

BSM

18:00-21:00

**Event Dinner (Honourable Artillery Company)****08-Sep-16****Location: Turing Lecture Theatre**

09:00-10:45

Panel: Military Internet of Things, Autonomy, and Things to Come (Dr. Mauro Tortonesi, Italy and Dr Niranjan Suri, USA)

10:45-11:15

**BREAK (Riverside Foyer)**

11:15-12:30

Symposium Highlights and Way Forward (Micheline Belanger, DRDC, Canada)

**12:30-13:15****LUNCH (Riverside Foyer)****Turing Lecture Theatre****Riverside 5****Riverside 4****Riverside 1**

13:15-14:45

3

Interoperability

3

C2 concepts

3

Metho-Exp-Ass

14:45-15:00

**BREAK (Riverside Foyer)**

15:00-17:00

4

Interoperability

4

C2 concepts

4

Metho-Exp-Ass

# Best Paper Nominees

- ▶ **The Unit Commander on the Move Experiment: Information and Communication Requirements for Effective Command and Control in a Dispersed Battlespace (#17)** - Session 16A, 8 Sept, 16:00
  - Michel Couillard, Marie-Eve Jobidon and Katherine M. Banko
- ▶ **Human Computer Collaboration at the Edge: Enhancing Collective Situation Understanding with Controlled Natural Language (#25)** - Session 6D, 6 Sept, 16:30
  - Alun Preece, William Webberley, Dave Braines, Erin Zaroukian and Jonathan Bakdash
- ▶ **A concept for 5th generation operational level military headquarters (#45)** - Session 15B, 8 Sept, 13:15
  - Yi Yue, Alexander Kalloniatis and Elizabeth Kohn
- ▶ **MIP Information Model 4.0 - Semantic Interoperability in Multinational Missions (#51)** - Session 15C, 8 Sept, 14:15
  - Michael Gerz and Nico Bau
- ▶ **Enhancing change detection of the unexpected in monitoring tasks – guiding visual attention in command and control assessment (#54)** - Session 10B, 7 Sept, 14:00
  - Ulrik Spak and Else Nygren
- ▶ **Measuring and Evaluating Interoperability for Complex C2 Information Management System-of-Systems (#64)** - Session 10C, 7 Sept, 14:30
  - Stephen Russell, Niranjana Suri and Rita Lenzi
- ▶ **Applying OntoClean for the Evaluation of the MIP Information Model (#81)** - Session 10D, 7 Sept, 14:00
  - Hans-Christian Schmitz

# Thanks

- ▶ Micheline Belanger, DRDC, CAN
- ▶ Dave Alberts, IDA, US
- ▶ Anthony Alston, QinetiQ, UK
- ▶ Liz Bowman, ARL, US;
- ▶ David Capewell, Dstl, UK
- ▶ Lorraine Dodd, Cranfield University, UK
- ▶ Peter Houghton, Dstl, UK
- ▶ James Lawton, US
- ▶ Niranjani Suri, IHMC, US;
- ▶ Austin Tate, University of Edinburgh, UK
- ▶ Michael Wunder, Fraunhofer-FKIE, GER
- ▶ Mohamad Allouche, DRDC, CAN
- ▶ John Haines, Dstl, UK
- ▶ Arne Norlander, SWE;
- ▶ Ken Teske, US
- ▶ Mauro Tortonesi, University of Ferrara, Italy
- ▶ Carla Bishop, Livegroup, UK
- ▶ Liz Hutton, Calders, UK
- ▶ Debbie Morgan, Livegroup, UK
- ▶ Jeanette Pepper, Dstl, UK
- ▶ Simon Spencer, Dstl, UK

<b>TIME</b>	<b>Tues 6 Sep</b>	
0800	<i>Registration</i>	<i>Riverside Foyer</i>
0945	Introduction	Prof Jitu Patel, Dstl, UK; Dr David Alberts, IDA, US
1000	Welcome	VAdm Duncan Potts DG Joint Force Development, MOD, UK
1020	Keynote	21st Century Missions and their challenges Lt Gen Sir David Capewell, Dstl, UK
1100	<i>COFFEE</i>	<i>Riverside Foyer</i>
1130	Panel	The Complex Enterprise Panel – Inter-Agency Collaboration Moderator: Prof Austin Tate, University of Edinburgh, UK
1300	<i>LUNCH</i>	<i>Riverside Foyer</i>
1400	Panel	Is our current approach to Command and Control fit for purpose? Moderator: Lt Gen Sir David Capewell, Dstl, UK
1530	<i>COFFEE</i>	<i>Riverside Foyer</i>
1600	Paper Session	4 Parallel Sessions
1800	<i>RECEPTION</i>	<i>Maxwell Library</i>