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Workshop Summary

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#149759

Abstract

To close the Workshop, COL Conrad Mialkowski, acting for Mr. Ken Peebles, Chief Research and Development, offered his impressions of the progress made during the week. He reviewed the highlights of the workshop, offered constructive criticism of the event and offered thanks to the organizers and workers.

Introduction

Well guys and gals, you done good! We've had a good (almost) three days of excellent interchange. I overheard lots of comments of the kind: "When I get back home, I'm going to try XXX" And that, in part, is what this is all about. Workshops are a stimulant to the imagination, and provide a motivation to use that person's ideas to get to the ultimate solution to all the world's problems before the next meeting. These workshops provide new sparks and also fan the flames to keep the creative process alive.

As you may not be aware Mr. Ken Peebles—CRAD—is delighted not to be here this morning. He is celebrating the joys of Paternity Leave and the birth of his new daughter, Emily. He has therefore asked me to fill in for him and provide this retrospective of the workshop.

In my comments this morning I'm going to say what I think was good about this event, but I'm also going to be a little critical—I hope in a constructive way.

Review

Major-General Fischer, in his opening address, described the context in which we find ourselves today. One aspect of that was a significant emphasis on "low cost". He said we must retain technological superiority at minimal cost. Keep it "high tech" but keep the cost down. This theme was reflected in a number of papers. We heard about the innovative

usage of mass-produced commercial distance-measuring sensors with minor modifications to solve needs for space craft. We heard in the Power Sources session, and elsewhere, about the need for efficiency, the fact that roughly one-quarter of the life-cycle cost of a system is energy and therefore we must minimize its consumption, and so on. Clearly, keeping costs down is a recognized requirement for future military systems, and that includes robotic systems and capitalizing on knowledge-based systems.

The General also challenged us to choose our problems carefully. He told us not to waste time and effort on the impossible, but at the same time, to not to let the seemingly impossible hold us back. And there were some good examples of that here. Some of the most impressive demonstrated accomplishments of AI² are in solving large and formerly highly labour-intensive, routine management problems such as logistic re-supply and for aircraft loading. In tasks like these it has become evident that the products of scientists and engineers like us *are* going to reduce the need for manpower as well as lower the cost of operations.

Bob Fischer challenged us to let robots break out of the structured factory environment. And we did indeed hear about increasingly versatile robotic devices for space use and about new vehicles such as ANT³ that effectively make some obstacles disappear. We *are* guiding robots out of the structured domain.

The General made reference to the need for international collaboration, and the value of that too, was highlighted in our Overview of Robotics.

Our session on Fuzzy Logic was unfortunately canceled, but this by no means signified a lack of interest or activity in this area. In my travels amongst the sessions, I heard many references to the applications of Fuzzy Logic. Had we put all those references together we would have had more than one session on the topic.

The TeleRobotics/Navigation session highlighted our need to understand the dynamics of operators and machines in the same system. Talk of the operator-

¹CRAD = Chief, Research and Development

²AI = Artificial Intelligence

³ANT = Articulated Navigation Testbed.

machine interface is not enough; we need to consider to two in the same system.

Our five invited speakers all provided us with much food for thought. General Fischer provided us with the challenge of the future in the military context. Jack Smith provided insight on how our world is going to change as a direct result of our own and other technological efforts. Jim Bowen provided new insight on how complementary neural networks and rule-based systems can be combined to solve problems better, or to solve problems that were previously intractable. Riccardo Patrella impressed upon us all the need to consider the global and ethical consequences of the development and management of new technology. And just this morning Martin Brooks provided us with a sense of accomplishment in the activities of Canadian robotics companies. I commend all of these speakers for widening our horizons and for reminding us of the need to consider factors outside of our immediate scientific interests.

As a participant in one of the Panel discussions I thought you all did a wonderful job asking us tough questions, and I was frankly amazed at the ability of the *other* panelists to answer them!

Towards Next Time

There are perhaps two areas where we might have done better.

I am disappointed not to have seen greater numbers of my colleagues in uniform here this week. We could not have located this workshop much closer to their normal place of work. And certainly we invited them to come and listen. But let's not blame them. What might we have done to win their interest? I think we should have been more aggressive in soliciting their input. We might have brought them in here personally and implored them to tell us more about their problems today. And perhaps we could have invited more of them to chair our technical sessions.

On the second matter I might be premature in this observation, but I have to admit that I didn't see the dynamic interchange between the Knowledge-Based Systems and Robotics communities that I had hoped to see. Now perhaps that will develop as a result of this joint workshop, but I think we are going to have to be more pro-active on this matter: we'll need to plan and structure the desired interaction.

This is the first time we have held this combined workshop, and on the whole I'm really pleased with the result. It has been an invigorating experience for me. We've come a long way, our momentum is up, and we're going to create those solutions two and three at a time! Keep up the good work.

Thanks

Before I finish, I'd like to add my thanks and indicate our appreciation to those who contributed to the success of this workshop. You may not know this, but it took a concerted personal effort on the part of CRAD himself—Mr. Ken Peebles—to make this event happen. In these times of resource reductions and political sensitivities, it required his active support to convince some senior people that this was the right thing to do. As Ken said in his opening, we thank all those who contributed through presenting papers and/or participating in the discussions.

The technical program was constructed through the hard work and leadership of Prof. Farooq of RMC⁴, Dr. Pierre Roberge, also of RMC, and Dr. Julius Grodski of DCIEM⁵. These men, the members of the Program Committee, and several additional reviewers—I don't know who you all were at this point, but we'll try to see that you are acknowledged in the Proceedings—all these people put in a lot of hours to make this gathering a truly productive and significant event.

There are several people in CRAD Headquarters who made sure you were registered and that the facilities were in place for your use. The registration team of Bob Elliott, Dorothy Hill, and Linda Baggs were most ably assisted by Ms Margaret Coll and Jennifer Weichel. Robert Pilon, Wally Blair and Maj Alan St-Onge looked after the meeting rooms, the lunches and the coffee, as well as supervising a staff of a number of volunteer projectionists. Sgt Louise Morin helped out in a number of ways including as a projectionist. Ms Cony Klaver is cataloguing your papers for the Proceedings; the list goes on. This is sounding just like the Academy Awards!

Bob Dobson has been a driving force behind these meetings for a long time. Besides helping to get this workshop on the rails initially, he was responsible for organizing the Exposition, for coordinating these events interdepartmentally, and for arranging the invited speakers. I'm sure you will agree that the presence of the Exposition added significantly to the "ambiance".

And finally, Dr. Harold Merklinger whose personal commitment and determination were pivotal to the success of these three days—very well done Harold!

Please join me in giving all these folks a round of applause!

⁴RMC = Royal Military College

⁵DCIEM = Defence and Civil Institute of Environmental Medicine.

Author	Page#	Author	Page#
Abu-Hakima, S.	337	Dégé, Michel	461
Adamovits, Peter	245	Dent, Ann	657
Adams, W. A.	189	Desbiens, Jocelyn	485, 593
Akhras, G.	367	Desrochers, Alain	55, 389
Amyot, J. R.	515	Dimopoulos, N.J.	5
Anantaraman, A. V.	189	Drascic, David	261, 269
Ananthanarayanan, S.	93	D'Eleuterio, G.M.T.	101
Andrews, W. S.	85	Eirich, Ron	283
Archibald, Colin	309	Elgazzar, S.	633
Ball, Roy	47, 383	ElMaraghy, Hoda A.	107
Basran, Jagdeep S.	293	Falcou, Gérard	461
Bassias, Constantinos	587	Farooq, M.	541, 641
Baudoin, Yvan	419	Feighan, Patrick	315
Bayoumi, M. M.	641	Fenrick, Dennis R.	649
Bélanger, Micheline	153, 159	Ferguson, James	541 (Farooq)
Bhavsar, Virendra C.	137	Ferland, Martin	581
Blais, F.	633	Fischer, MGen R. N.	1
Blezius, Jeffrey	63	Fisher, G. F.	493
Bock, O.	101	Folinsbee, Terry	383
Boev, W.	515	Foo, H. C.	367
Boily, Jocelyn	345	Fox, Mark S.	13
Boucher, J.F.	329	Freedman, Paul	277
Boulanger, Pierre	731	Fugere, Jean	225
Bourassa, Gregory	601	Gagné, Denis	485, 593
Bowen James E.	375	Garant, Alain	485
Bowen, B. Archie	71, 375	Gaskill, H. S.	123
Brooks, Martin	655	Gauvin, Marlène	237
Brosinsky, Chris	649	Gely, Paul	709
Brown, Richard G.	159	Gill, S.	173
Bryden, Karen	471	Goldenberg, A. A.	93
Burtnyk, Nestor	253	Goldfarb, Lev	137
Caldwell, D.E.	509	Graham, Barry	345
Carling, Robert L.	145	Graham, Darin P.	253
Carrel, Aubert	461	Green, D. N.	183
Carruthers, Al	283	Green, D. A.	633
Chaib-draa, B.	625	Grodski, Julius J.	101, 261, 269, 429, 435, 447, 701
Chalmers, Bruce A.	677	Hall, Bart	701
Chrystall, Keith	63, 315	Hanna, Doug M.	649
Cohen, P.	173	Hardy, Gordon	565
Cox, David S.	85	Harris, Gail E.	501, 685
Croteau, Danie	389	Hay, Robert	329
Cunningham, R. G.	197	Hayashi, Robert	657
Cyre, Walling R.	323	Helie, J.	329
Cyril, Xavie	573	Hemami, Ahmad	693
Dagnino, Aldo	315	Henneker, W.H.	611
Dai, Heping	739	Hensler, John	211
Damaren, Chris	547	Hinchey, Michael	167
Das, Yoga	283	Huculak, Michael	573
Dawes, Nick	77	Hurteau, R.	173
Dawson, C. P.	123	Jenkins, L.	723
de Moulins, J.-L.	461		

Author	Page#
Jetzelsperger, R.	245
Johnson, Ivan	13
Jones, Stephen	587
Jones, Major S.	723
Kamat, Vithal N.	137
Kennedy, J. L.	329
Kiguchi, Kazuo	747
Kim, B.	183
Korba, Larry	39
Korelsky, T.	509
Kramer, Al	283
Krouglicof, N.	55, 389
Labbé, Gaétan	329
Labbé, Marcel	21
Laidley, R. G.	205
Lamontagne, Luc	477, 625
Laplante, Martin	501, 685
Lecavalier, M.	633
Lelarge, Annie	461
Levesque, P.	625
Lewis, B.J.	85
Li, Kin F.	5
Liang, Feng	107
Lind, Peter C.	715
Lipitkas, J.	101
Liu, Jianli	71, 375
Lizotte, Michel	237
Lortie, Martin	709
Lu, Z.	93
Marrocco, Bernard	345
Malowany, A	351
Manz, A	197
Mason, R. D.	197
Matthews, J. R.	329
McCormac, Alan W.	649
McMath, W. S.	39, 411
Megley, Rick	573
Mialkowski, Col C.	755
Mikolajuk, Zbigniew	529
Milgram, Paul	261
Miller, S. J.	397, 555
Murgulescu, M.C.	301
Mylopoulos, J.	93
Nault, Georges	485
Necsulescu, Dan S.	183, 747
Nelson, Terrence J.	179, 405
Neville, Stephen	5
O'Shea, Jules	581
Pagurek, Bernard	77
Paquet, E.	625
Paquin, Normand	63

Author	Page#
Peebles, K. A.	Foreward
Pelkowitz, Lionel	47
Penzes, Steve	47
Petriu, Emil M.	293, 309, 411
Phan, C. S.	611
Phelps, Russel M.	435
Piedboeuf, J.-C.	173, 397, 555
Poehlman, W. F. S.	715
Poulin, Jean	709
Pouplard, Jean-Pierre	461
Preston, Jon M.	115
Pryor, Tim	383
Rabemanantsoa, M.	581
Rastogi, Anu	261
Richard, Denis	55
Richardson, Capt J.	21
Roberge, P. R.	29, 205, 493, 617
Roy, Dominic	237
Saks, Victor	13
Salvador, J. P.	205
Sandrasegaran, K.	351
Sasiadek, J. Z.	183
Sassine, Raymond	587
Selkirk, C. G.	493
Seifu, Solomon	253
Sfeir, Daphne	63
Sharf, Inna	547
Shupe, Landy	115
Smith, J. E	131
Solem, Eric	523
Suen, Ed	657
Swinson, M.L. LtC	441
Taylor, Ivan	219
Thomas, Grant	537
Thompson, J. Walter	739
Tinney, LCdr Mark	211
Toulouse, Michel	593
Tousignant, C.	587
Trethewey, K. R.	29
Trif, N.	411
Viens, Capt François	77
Watkins, Andrew	5
Wattie, Dwaine	471
Weisman, Maj R.	225
Wojcik, Peter	63
Woods, Steven	665
Yamakawa, D.	5
Yaniv, Elan	323
Yeung, S. K.	39, 411, 493
Zhao, Hong	219
Zhao, C. S.	641

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