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Understanding and Harnessing the Power of Ideas, Persuasion and Trust

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## Understanding and Harnessing the Power of Ideas, Persuasion, and Trust: Enabling Collaborative Performance and Effective Coalitions

**Title and Subtitle**

**Dates Covered**

**Author(s)**

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**Performing Organization Report Number**

**Sponsoring/Monitoring Agency Name(s) and Address(es)**

**Sponsor/Monitor’s Acronym(s)**

**DISTRIBUTION/AVAILABILITY STATEMENT**

**Supplementary Notes**

**ABSTRACT**

Work on identifying and understanding the foundation research challenges for trust and influence involved the (a) the identification and engagement of over 40 global thought leaders from across the behavioral, social, political, anthropological and computer sciences to aid in the identification of current knowledge gaps and viable multi-disciplinary and multi-cultural approaches, (b) the expert assessment of leading edge advances and options for leveraging their value to the USA, and the (c) stimulation and elaboration of select research problems as whitepapers in collaboration with leading international researchers and to provide detailed evaluations of their option value to the Air Force Office of Scientific Research and DoD.

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27

**Name of Responsible Person**
Understanding and Harnessing the Power of Ideas, Persuasion and Trust

INTRODUCTION:
The objectives of this effort were (a) to identify and understand the research challenges that underlie the effective harnessing of the power of ideas, persuasion and trust to enable collaborative performance and (b) apply acquired perspectives, data and insights to leveraging the scope and thrust of the AFOSR basic science portfolio on trust and influence. Prior work * focused on characterizing the causal dynamics of ideas and how modes of representation and conveyance promote influence, aid persuasiveness and engender trust. The present effort built on this conceptual foundation.

APPROACH and ACCOMPLISHMENTS:
Work on identifying and understanding the foundation research challenges for trust and influence involved the (a) the identification and engagement of over 40 global thought leaders from across the behavioral, social, political, anthropological and computer sciences to aid in the identification of current knowledge gaps and viable multi-disciplinary and multi-cultural approaches for closing them (see Table 1), (b) the expert assessment of leading edge advances and options for leveraging their value to the USAF (see Tables 2 & 3), and the (c) stimulation and elaboration of select research problems as whitepapers in collaboration with leading international researchers and to provide detailed evaluations of their option value to the Air Force Office of Scientific Research and DoD (See Table 4).

a. **Expert Network**: In the course of the last year, travel was constrained, so, as a cost-effective alternative, I engaged in extensive online interactions with the research scientists detailed in Table one. These interactions centered on discussions of their personal research and perspectives on where significant challenges remained to be addressed. Some of these interactions, in turn, progressed to dialogs where specific elements of the research challenges were further elaborated. A subset of these correspondents were subsequently invited to submit concept white papers elaborating these ideas in a form responsive to BAA-AFOSR-2013-0001.

b. **Conferences attended.** In the course of the reporting period, I attended two conferences/workshops with the intent of establishing contacts with new subject matter experts in gap areas relevant to the trust and influence research challenges and the AFOSR BAA.

   a. NATO HFM Specialists Meeting on the topic of “Social Media: Risks & Opportunities in Military Applications.” 16 – 18 April 2012, Tallinn, Estonia. (Note that this grant had been anticipated to start in early April and encompass

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this meeting). The meeting included about 90 international attendees from NATO and Partners for Peace nations plus Japan and Israel. The USAF Chief Scientist attended and was actively involved throughout the meeting. The meeting focused on military supported research from both the private and public sectors and included S&T on the use and implementation of social media, trends and future implications, security risks associated with social media, best practices and the future of social media, the technology of social media, analysis of social media, cultural specific issues related to social media implementation, communications through social media and the economics of social media implementation. Several very useful contacts and contacts by referral were acquired.

b. Second South East Asian Network of Ergonomics Societies Meetings held at Langkawi, Malaysia, July 8-12 2012.

From time to time, it is important to re-establish the bases for doing business (i.e. the business of science) in Asia... which at the same time also serves as a relevant background for my participation at this regional conference. In traditional Asia, the establishment and building of relationships is a necessary prerequisite to collaborative work. Meeting people, particularly senior people of importance can be difficult without an intermediary who can provide an introduction that is, in effect, a warrant of legitimacy. As you meet people and build trust in the relationship, they, in turn, become potential intermediaries for assisting you to establish new relationships thereby enabling a growing sphere of influence.

As an organization, AOARD has established many trusted relationships with scientists and engineers throughout Asia, a number of which have outlasted the PM who established them. Attendance at regional technical conferences can also be an effective way to meet and begin building relationships with local S&Es though it is not always the best path to meeting the more senior people.

Historically, Asia has not been a strong innovator in the behavioral and social sciences. Most of the successful S&Es in these areas were educated in the US but have had a hard time finding the resources to conduct research outside their academic responsibilities. As a result, much of the past research has been pretty mundane and trailing the state of the art. Human factors related research has tended to be ergonomic-centered on issues of measurement and practice with a strong orientation towards Occupational Health and Safety.

Over the last 10-12 years, there has been growing surge of R&D driven, in large part, by the revolution in Information Technology, which has profoundly affected Asian society, culture, education and military capabilities. The social sciences have, in turn, been energized by state of the art research in HCI,
cognitive science, cultural cognition, modeling and simulation etc. As expected, the level of advancement and quality of science varies significantly, in line with state economics, across the Asian countries. The highest end work, (i.e., competitive with the US) can be found in Singapore, Korea, Taiwan, Japan and China. Small pockets of good work exist in India, the Philippines and Malaysia.

SEANES or the South East Asian Network of Ergonomic Societies of the Philippines, Thailand, Malaysia, Indonesia and Singapore is of particular interest (1) because of its intent to sharpen regional standards to meet IEEE standards for conducting and reporting research. (2) the explicit broadening of its purview from traditional “nuts and bolts” ergonomics to encompass IT and cognitive sciences motivated research and (3) The 2012 Chair and Host of SEANES was a successful AOARD grantee who has provided valuable support over a decade to AOARD as an expert intermediary to SMEs across Asia. With these aspects in mind, I agreed to participate on the organizing committee and serve as a senior mentor of sorts. Other prominent members of the organizing Committee included senior representatives from UK, US, Canada, the Netherlands and Australia.

My evaluation of the meeting is that it was only FAIR or roughly 2 on a 5-point scale. Given the countries involved, there was an evident improvement of the standards of research but with clear room for further improvement. Only a small number of papers that were outside the traditional scope of ergonomics passed peer review that was, from my perspective, somewhat disappointing. However, on the bright side, a couple of these papers were interesting and showed promise. Several potentially good contacts were made with established PIs from the Philippines and Indonesia with whom I intend to follow up.

c. **Technical and Proposal Reviews:**
   I attended and served as a subject matter expert at four onsite reviews (Stanford University, CA, EOARD London, UK, Tokyo, JP and WPAFB, OH.) as detailed on Table 3. Two of these reviews required expert content assessments provided as feedback to the AFOSR portfolio manager. Four of these reviews involved the offsite formal peer assessment of the quality of proposed efforts. Additionally, peer-reviews were accomplished on a case-by-case basis for out of cycle or unsolicited proposals. Collectively, these involved review of approximately 25 proposals.

d. **Stimulation of Concept Whitepapers and Proposals:** As a result of the online interactions with the investigators shown in Table 1, Twenty-two (22) white papers were solicited. Thirteen of these were Whitepapers were delivered and subsequently peer-reviewed as illustrated in Table 4. Based on the peer-reviews, seven of these white papers were invited to prepare full proposals for grants or conferences and are in various stages of processing for award.
TRUST AND INFLUENCE RESEARCH CHALLENGES:

1. **Nature of Ideas, Ideologies and Influence:**
   a. What underlies "attractiveness" and "stickiness" of compelling fringe ideas?
   b. What is the role of social-cultural context (e.g. religious, political, socio-economic, etc.)?
   c. How do modes of representation and conveyance (e.g. rumor, propaganda, ideology, etc) promote influence, aid persuasiveness and engender trust of fringe ideas?
   d. What enables some ideas to go viral?
   e. How can we understand the degree to which an idea is genuinely ‘fringe’ and not simply a product of suppression in authoritarian or semi-authoritarian societies?
   f. How are social belief systems formed and how do they become entrenched?
   g. Can the causal power of ideas be measured and predicted?

2. **Power to influence:**
   a. What underlies the plausibility and power of rumors and fringe ideas among the SFGs in which they circulate?
   b. How do contemporary influence theories (such as Cialdini’s influence principles) hold up in a digital world? We need a science and supporting theories to support "socio-digital influence."
   c. What are the precursors of social action arising from fringe ideas?
   d. When and how best can “out-of-kilter” belief systems be rebutted with minimal unintended consequences?
   e. What empowers highly influential humans in competitive environments and what are the means for sustaining or countering influence in a dynamic and changing world?
   f. Why do leaders in the “spotlight” of a trust violation typically adopt dysfunctional, self-destructive trust repair strategies, and what are alternative options?
   g. What is the psychology of counter-persuasion?
3. **Transmission:**
   a. What cultural issues affect the power of persuasion?

   b. How are ideas and memories that contribute to identity socially transmitted?

   c. What can be expected as a result of emerging technologies that change the nature of social interactions?

   d. How do inter-cultural communication processes and media between members and non-members of fringe groups influence the dissemination and acceptance of outlier ideas?

   e. Modeling the spatial and temporal constraints of social media on mass persuasion and community formation to better understand the bases of short-term local effects vs longer-term wide-area effects

   f. What are the options and limitations of analytic, empirical and modeling approaches to characterizing, studying and understanding the *propagation and influence of compelling ideas*?
# TABLE 1: GLOBAL THOUGHT LEADERS CONTACTED 2012 - 2013

<table>
<thead>
<tr>
<th>Country</th>
<th>Name</th>
<th>Institution/Role</th>
<th>Academic Field/Research Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUS</td>
<td>Hussein Abbass</td>
<td>U of New S Wales Canberra, Australia</td>
<td>The Trust Machine</td>
</tr>
<tr>
<td>AUS</td>
<td>Phillipa Pattison</td>
<td>Deputy Vice-Chancellor, U of Melbourne</td>
<td>Psych; Complex, networked social systems</td>
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<tr>
<td>AUS</td>
<td>Garry Robbins</td>
<td>Psych; U of Melbourne</td>
<td>Social networks/Stat</td>
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<tr>
<td>AUS</td>
<td>Scott Sharp</td>
<td>Mathematical, Environmental &amp; Phys Sci, Australian Defence Forces Academy</td>
<td>Processes of social and cultural marginalization</td>
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<tr>
<td>EGYPT</td>
<td>Abdel-Hamid Abdel Latif</td>
<td>Chairman, the Egyptian Research &amp; Training Center</td>
<td>Sociologist, intergenerational values</td>
</tr>
<tr>
<td>INDIA</td>
<td>Purnima Singh</td>
<td>Department of Humanities and Social Sciences, IIT Delhi</td>
<td>Social Psych; Radical group behavior; Social justice</td>
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<tr>
<td>INDON</td>
<td>Hamdi Muluk</td>
<td>Soc &amp; Pol Psych, U of Indonesia</td>
<td>Peace Psychology, Religious fundamentalism/terrorism</td>
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<tr>
<td>INDON</td>
<td>Mark Woodward</td>
<td>Faculty of Uslluluddin and Islamic Thought, Sociology of Religion Department,</td>
<td>Sociology of Religion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Su11ail Kalijaga State Islamic University And Arizona State University</td>
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<td>JAPAN</td>
<td>Greg Dalziel</td>
<td>Keio University Tokyo</td>
<td>Rumors</td>
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<td>JAPAN</td>
<td>Toshiyuki Inagaki</td>
<td>Department of Risk Engineering, U of Tsukuba</td>
<td>Trust and Robotics</td>
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<tr>
<td>JAPAN</td>
<td>Akira Namatame</td>
<td>Dept. of Computer Science, National Defense Academy,</td>
<td>Complexity, Complex social-technological systems</td>
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<td>JAPAN</td>
<td>Yoshifumi Nishida</td>
<td>AIST-Odaiba: Digital Human Research Center</td>
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<td>JAPAN</td>
<td>Pao Sriprasertsuk</td>
<td>Grad School of Global Info &amp; Telecom Studies, Waseda U, Tokyo</td>
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<tr>
<td>JAPAN</td>
<td>Roland Kelts JP &amp; US</td>
<td>author, journalist and speaker</td>
<td>Digital Youth Culture</td>
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<td>KOREA</td>
<td>Uichol Kim</td>
<td>College of Business Administration, Inha University, Korea</td>
<td>Human rights &amp; political culture</td>
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<td>Malaysia</td>
<td>Prof. Dr. Abdul Rahman Embong</td>
<td>Institut Kajian Malaysia &amp; Antarabangsa (IKMAS) Institute of Malaysia &amp; International Studies Unversiti Kebangsaan Malaysia</td>
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<td>Shamsul Haque</td>
<td>Sch of Med &amp; Health Sci, Monash U, Sunway</td>
<td>Psych, Cultural beliefs &amp; Identity</td>
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<td>Halimahtun Khalid</td>
<td>Principal Scientist, Damash Sciences Sdn Bhd</td>
<td>Human and cultural factors</td>
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<td>Malaysia</td>
<td>Mei-Hua Lin</td>
<td>Dept of Psych, Sunway U</td>
<td>National &amp; Cognitive differences Research</td>
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<td>Nor Laila Md Noor</td>
<td>Systems Sci Studies, Faculty of Comp &amp; Math, Sci, Universiti Teknologi Mara</td>
<td>enterprise work and community interaction</td>
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<td>Helen Ting</td>
<td>IKMAS (Institute of Malaysian &amp; International Studies), Selangor</td>
<td>Pol Science: Inter-ethnic &amp; Inter-cultural relations</td>
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<td>Shafiz Affendi Mohd Yusof</td>
<td>College of Arts and Sciences (School of Computing), Universiti Utara Malaysia,</td>
<td>Information Sharing Behavior in Social Networks</td>
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<td>Sintok, Kedah, Malaysia</td>
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<tr>
<td>Malaysia</td>
<td>Nasriah Zakaria</td>
<td>Medical Informatics and E-learning Unit, Medical Education Department College of Medicine King Saud U, Riyadh, Kingdom of Saudi</td>
<td>Swift Trust Formation in Global Virtual Teams</td>
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<tr>
<td>Country</td>
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<td>NE</td>
<td>Ilij van Beest</td>
<td>Prof, Social Psychology Tilburg U</td>
<td>coalition formation, social exclusion, negotiation, emotions</td>
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<td>NZ</td>
<td>Matthew Dentith</td>
<td>Auckland, NZ</td>
<td>Investigating Conspiracy Theories</td>
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<td>NZ</td>
<td>James H. Liu</td>
<td>Psych, U of Wellington</td>
<td>Intercultural communication, social and cognitive processes in collaboration</td>
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<td>Taiwan</td>
<td>Hao-Chuan Wang</td>
<td>Assist Prof in Dept of Computer Science, National Tsing Hua University</td>
<td>Intercultural communication, social and cognitive processes in collaboration</td>
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<td>Turkey</td>
<td>Nora Fisher Onar</td>
<td>Ahiçeşehir U, Political Science and International Relations, Also, Director, SouthEast Eur Stud at Oxford branch in Istanbul</td>
<td>Political Sociology</td>
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<tr>
<td>Sing</td>
<td>Cheong Siew Ann</td>
<td>National Technical University (NTU)</td>
<td>Modeling of how to Harness Trust and Influence in Cyberspace</td>
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<td>Sing</td>
<td>Syed Adnan Ali Shah BUKHARI</td>
<td>Assoc Res Fellow &amp; Team Leader South &amp; Central Asia, International Centre for Political Violence and Terrorism Research (CPVTR, NTU)</td>
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<td>Sing</td>
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<td>Statistics</td>
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<td>Department of Philosophy, Nat U of Singapore</td>
<td>Philosophical problems of model-based representation; Rumors</td>
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<td>Organizational Behaviour and Human Resources, Lee Kong Chian School of Business Singapore Management U</td>
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<td>Sing</td>
<td>Martin Helender</td>
<td>Nanyang Technological University, School of Mechanical &amp; Aerospace Engineering</td>
<td>Human Computer Interfaces and interaction</td>
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<td>Using Brain-State Information to Facilitate Conditioned Attitude Formation</td>
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<td>Director of Emerging Research Lab, School of Computer Engineering, Nanyang Technological University</td>
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<td>UK</td>
<td>Angelo Cangelosi</td>
<td>Professor of Artificial Intelligence and Cognition, University of Plymouth</td>
<td>Cognitive robotics</td>
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<td>US</td>
<td>Scott Atran</td>
<td>U of Michigan</td>
<td>Mutual influence of moral values, mental models and social dynamics on intergroup conflict</td>
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<td>US</td>
<td>Michele Gelfand</td>
<td>U of Maryland</td>
<td>Culture, contagion of conflict</td>
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<td>US</td>
<td>Arie Kruglanski</td>
<td>U of Maryland</td>
<td>Cultic Studies</td>
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<td>US</td>
<td>Michael Langone</td>
<td>Counseling psychologist, Naples FL</td>
<td>Cultic Studies</td>
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<td>US</td>
<td>Jacob Shapiro</td>
<td>Princeton University</td>
<td>Terrorism, Development, and Governance</td>
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### TABLE 2: CONFERENCES ATTENDED

<table>
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<tr>
<th>Event</th>
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<tr>
<td>RTO Specialists Meeting on “Social Media: Risks and Opportunities in Military Applications”</td>
<td>16 – 18 April 2012</td>
<td>Tallinn, Estonia</td>
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<td>Second South East Asian Network of Ergonomics Societies Meetings</td>
<td>July 8-12 2012</td>
<td>Langkawi, Malaysia</td>
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### TABLE 3: FORMAL TECHNICAL & PROPOSAL REVIEWS

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<th>Event</th>
<th>Date</th>
<th>Location</th>
<th>Reviewer(s)</th>
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<td>Minerva Annual Review, “Terrorism, Governance and Development”</td>
<td>June 5, 2012</td>
<td>Stanford University, CA</td>
<td>Joe Lyons</td>
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<td>LRIR Reviews</td>
<td>June 2012</td>
<td>Remote Proposal reviews (7)</td>
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<td>BAA Proposal Reviews</td>
<td>Aug/Sept 2012</td>
<td>Remote Proposal reviews</td>
<td>Joe Lyons</td>
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<td>AFOSR Young Investigator Proposals</td>
<td>Aug 2012</td>
<td>Remote Proposal reviews</td>
<td>Joe Lyons</td>
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<td>ISO Strategy</td>
<td>2-15 September 2012</td>
<td>EOARD London UK AOARD, Tokyo, Japan</td>
<td>Col K Gresham</td>
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<td>AFOSR BAA Trust Review</td>
<td>14-17 January 2013</td>
<td>Wright-Patterson AFB, OH.</td>
<td>Joe Lyons</td>
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<tr>
<td>MINERVA proposal reviews</td>
<td>Feb 2013</td>
<td>Remote Proposal reviews (7)</td>
<td>Joe Lyons &amp; Erin Fitzgerald/OSD</td>
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<td>Multiple single proposal reviews</td>
<td>5-12 to 4-13</td>
<td>Remote Proposal reviews</td>
<td>Joe Lyons</td>
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<td>Affiliation</td>
<td>Title</td>
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<td>Halimahtun M. Khalid, et al*</td>
<td>Damai Sciences Sdn Bhd, Malaysia</td>
<td>Trusting Humanoid Robot Undertake Social Tasks (3-11-13)</td>
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<td>Ilja van Beest*</td>
<td>Tilburg University, NE</td>
<td>Meaning Seeking in Fringe Group Members</td>
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<tr>
<td>Hussein Abbass</td>
<td>U of New S Wales Canbera, Australia</td>
<td>The Trust Machine</td>
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<td>Cheong Siew Ann Akira</td>
<td>NTU Sin NDU, Japan</td>
<td>Modeling of how to Harness Trust and Influence in Cyber-space</td>
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<td>Namatame**</td>
<td>NCU, Taiwan</td>
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<tr>
<td>Shu-Heng Ch</td>
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<tr>
<td>Abdel-Hamid Latif <a href="mailto:hamidlatif.79@gmail.com">hamidlatif.79@gmail.com</a></td>
<td>Egyptian Research and Training Center, Cairo, Egypt</td>
<td>Building Trust and the Power of Social Media in the Road to Revolution and Democratic Transition: The Egyptian Case</td>
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<tr>
<td>Garry Robins et al</td>
<td>University of Melbourne, AU</td>
<td>Dynamic multilevel analysis of social media for attitudinal and disaster management applications</td>
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<td>Norhayati Zakaria*</td>
<td>Saudi Elect U, SA</td>
<td>You are a Stranger! Examining the Process of Swift Trust Formation in Global Virtual Teams from a Cultural Perspective</td>
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<td>Matthew Dentith</td>
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<td>Investigating Conspiracy Theories</td>
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<tr>
<td>James Liu et al*</td>
<td>Victoria University of Wellington, NZ</td>
<td>Implicit and Explicit Attitudes towards America in Socio-Digital Influence:</td>
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<tr>
<td><a href="mailto:james.liu@vuw.ac.nz">james.liu@vuw.ac.nz</a></td>
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<tr>
<td>Don Ferrin*</td>
<td>SMU, Sing</td>
<td>First International Network on Trust (FINT) Singapore Workshop 21-23 Nov, 2013</td>
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<tr>
<td>Trevor PENNEY*</td>
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<td>Using Brain-State Information to Facilitate Conditioned Attitude Formation</td>
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<td>Michelle SEE, <a href="mailto:psyshym@nus.edu.sg">psyshym@nus.edu.sg</a></td>
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<td>YEN Shih Cheng</td>
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<tr>
<td>Mark Woodward*</td>
<td>Kaliijaga State Islamic University, Indonesia and Arizona State U</td>
<td>Workshop series on “Exploring the Roots of Intolerance”</td>
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APPENDIX 1

CURRICULUM VITAE

KENNETH R BOFF
CURRICULUM VITAE

Kenneth Richard Boff

8260 Barton Farms Blvd - Sarasota FL 34240
941-706-2455
krboff@gmail.com

POSITIONS:

• Principal Scientist, Socio-Technical Sciences 2009-
• Principal Scientist, Tennenbaum Institute, Georgia Institute of Technology 2007-2012
• Senior Technical Advisor, Asian Office of Aerospace Research and Development, Tokyo, Japan 2007-2010
• Independent Consultant 2007-
• Chief Scientist, Human Effectiveness Directorate, Air Force Research Laboratory. Wright-Patterson Air Force Base, OH 1997-2007
• Director, Fitts Human Engineering Division, USAF Armstrong Lab Wright-Patterson Air Force Base, OH 1991-1997
• Director of Design Technology, Aerospace Medical Research Laboratory 1988-1991
• Engineering Research Psychologist, Aerospace Medical Research Laboratory. Wright-Patterson Air Force Base, OH 1980-1988
• Research psychologist. AF Human Resources Laboratory Wright-Patterson Air Force Base, OH 1977-1980

EDUCATION:

Ph.D. Experimental Psychology, Columbia University 1978
M.Phil. Experimental Psychology, Columbia University 1975
M.A. Experimental Psychology, Hunter College (CUNY) 1972
B.A. General Psychology, Hunter College (CUNY) 1969

PROFESSIONAL ACTIVITIES AND MEMBERSHIPS:

• Technical Advisory Board Member: Army Research Laboratory 2013 -
• Chair, National Academy of Sciences, Soldier Systems Panel 2013 -
• Advisory Board: Southeast Asian Network of Ergonomic Societies Conference. Lankawi, Malaysia. 2012 -
• Panel Member: National Academy of Sciences, Soldier Systems Pane2011-
• Technical Auditor, R&D portfolio of the Center for Behavioral Sciences, Liberty Mutual Insurance Co, Hopkinton, Ma 2010
• Panel Member: FAA Research Engineering Development Advisory Committee to assess cultural impacts of NextGen: The redesign and development of the Next Generation National Aerospace Management System 2010-2011
• Human Computer Interaction and Visualization Advisory Board, University of Kaiserslautern, GE (Annual meeting) 2007-2011
• Technical Reviewer, AFOSR MURI on Socio-Cultural Modeling 2008-2010
• Chair, International Workshop on The Etiology and Impact of Digital

- Chair, International Work Shop on Culture: Affect, Behavior and Cognition. Langkawi, Malaysia 2008
- Chair, FAA Human Factors R&D Advisory Committee 2007-2009
- Steering Committee: International Federation of Automatic Control (IFAC) Seoul, South Korea 2006-2007
- Associate Editor, Information-Knowledge-Systems Management Journal 2004-
- Editorial Board, Handbook of Human Factors, Wiley & Sons 2003-2005
- Steering Committee: HCI International 2005, July, Las Vegas NE 2004-2005
- Steering Committee; Intl Conference on Work with Computing Systems, Sarawak, Malaysia 2003-2004
- Steering Committee; International Symposium of Aviation Psychology, Dayton, OH 2002-2003
- Steering Committee: HCI International 2003, June, Crete, GR 2002-2003
- Co-Chair: RTO Symposium on the Role of Humans in Automated Systems. Oct 2002; Warsaw, Poland.
- Member, NATO Technical Group on Battle Space Visualization: Paris, Amsterdam 2000-2002
- Chair, RTO Symposium on Usability of Information in Battle Management Operations. April, Oslo, Norway 2000
- Organizing Committee, IEEE Computer Society Symposium on Human Interaction With Complex Systems '00, Champaign-Urbana IL 1998-1999
- Steering Committee, 8th Computer Generated Forces Conf. Orlando Fl 1998-1999
- Director, Putting Technology To Work Workshop; Sinclair College 1998
- Steering Committee, HCI International '00 1998-
- US National Coordinator and HF Chair, NATO Research & Technology Organization (RTO), Human Factors and Medicine Panel 1997-2003
- US National Coordinator, NATO AGARD Aerospace Medicine Panel 1997
- Steering Committee, HCl -Aero 98; Montreal CA 1997-1998
- Steering Committee, IEEE Info Visualization 98 1997-1998
- Steering Committee, HCl International '99 1997-1999
- Steering Committee, 2nd Conference on IE Applications and Practices 1997
- Technical Advisor, IEEE Science, Engineering & Technology Congressional Visits Day (16-17 Apr 97) 1997
- Advisory Committee, ASEAN Ergonomics 97, Kuala Lumpur, Malaysia 1996-1997
- USAF Principal Member, Human-Centered Systems Committee, National Science and Technology Council (NSTC) 1996-
• Steering Committee for Establishment of Ohio Regional Center for Information Technology 1996
• Session Chair, Ergonomics Society Annual Conference on *Cognitive Quality in Advanced Crew Systems Concepts (United Kingdom)* 1996
• Editorial Board of *Handbook of Applied and Engineering Psychology* 1996
• Organizing Committee, IEEE Computer Society Symposium on Human Interaction With Complex Systems, Dayton OH 1996
• Chair, Organizing Committee NATO AGARD Symposium on Crew Collaboration, Oslo, Norway, 1996-1998
• Chair, Membership Committee; Human Factors & Ergonomics Society 1995-1997
• External Reviewer: Wright-State University Regional Strategic Plan 1995
• HSI Chair, DOD Infrastructure Review 1994
• Chair, DOD Human Systems Interface Panel 1994-1998
• Chair, Joint Directors of Labs Human Systems Interface Panel 1992-1994
• Chair, NATO AGARD Working Group 20 on 3-D Surface Anthropometry, 1992-1995
• Consultant, National Academy of Sciences/National Research Council: Panel on Human Error 1992
• Chair, Human Factors Committee, NATO AGARD, Aerospace Medical Panel 1991-1997
• Member, Scientific Task Planning Group for development of the Aviation Human Factors National Plan - Federal Aviation Administration 1990
• Steering Committee: International Conference on Human Factors in Design for Manufacturability and Process Planning. Honolulu, Hawaii 1990
• Member, NATO Defense Research Group, Panel 8 RSG on Human Error 1990
• Chair, Steering Committee for Crew Systems Ergonomics Information Analysis Center 1990-2003
• Peer Reviewer, member, IEEE Systems, Man, and Cybernetics Society 1987-1997
• Member, National Research Council/National Academy of Sciences: Sponsor Committee on Human Factors 1987-2004
• Member, Panel on Human Factors Specialist Utilization and Education National Research Council/National Academy of Sciences 1987-1990
• Member, Visual Simulation Committee of the Tri-Service Simulation Technology Advisory Group 1987-1989
• Review Board: USAF Air Safety Mishap Panel 1987-1989

- Reviewer, Applied Vision Association (UK) 1980-1986
- Peer Reviewer Human Factors & Ergonomics Society 1977-2007

AWARDS AND HONORS:
- Presidential Rank Award (Nominated by the Secretary of the AF) 2007
- IEEE Senior Member 2004
- Edenfield Executive in Residence; Georgia Institute of Technology 2002-2004
- NATO Scientific Achievement Award 2003
- NATO RTO/HFM Panel Excellence Award 2002
- Fellow, International Ergonomics Association (IEA) 2000
- Fellow, Human Factors & Ergonomics Society 1997
- Department of Defense, Certificate of Merit, Joint Logistics Commanders 1996
- Department of Defense, Technology Transfer Award 1993
- Directors Award, Armstrong Laboratory 1991
- Scientific and Engineering Technical Achievement Award, Air Force Systems Command 1989
- Best Paper Award - Human Factors Society 1988
- Meritorious Award for Program Management 1985
- Rank Prize award, Cambridge University, UK 1984
- Columbia University Graduate Fellowship 1972-1976

CITATIONS:
- Who's Who in the USA
- Who's Who in America
- Who's Who in the World
- Who's Who in Science & Engineering
- Who's Who in Frontier Science and Technology
- Who’s Who of Emerging Leaders in America
- Who's Who in the Midwest
- Who’s Who in Society
- Dictionary of International Biography
- International Who's Who of Contemporary Achievement
- Personalities of America

SPECIALIZED TRAINING:
- Vanguard Information Technology & Innovation Workshops 2000-2004
- Management of Technology & Innovation, CalTech, Pasadena CA 2002
- Understanding the S&T Enterprise, Brookings Institute, Wash DC 1999
- Marketing Management, WPAFB 1999
• Competitive Technological Intelligence, Georgia Institute of Technology 1998
• Seven Habits of Highly Effective People, Steven Covey 1998
• First Things First, Steven Covey 1997
• 101 Practices of World Class R&D Management, WPAFB 1995
• USAF Acquisition Professional Development Program, Level III 1994
• Public Policy Challenges Facing DOD, Brookings Institute, Wash DC 1994
• Leadership: Creating Opportunity with a Changing Workforce, WPAFB 1994
• Liberation Management, Tom Peters 1993
• Systems Engineering, AFIT, WPAFB, OH 1992
• Acquisition Management, AFIT, WPAFB, OH 1992
• Human Resource Management Today, American Management Association 1992
• Issues in Science & Technology for Science Executives, Brookings Inst 1990
• Total Quality Management, Deming 1989
• Advanced Human Factors Engineering, University of Michigan 1977

SIGNIFICANT ACCOMPLISHMENTS:
R&D Leadership & Management:

• Senior Mentor and advisor: AFRL International Program 2006-2007
  encompassing technical agreements with 39 countries
• HE Chief Scientist responsible for quality and value performance of 1997-2007
  ~$200M/yr R&D portfolio.
• Established AFRL thrust on Revolutionary Human Optimization to 2005-2007
  capitalize on advances in psycho-pharmacology, robotics and
  augmented cognition
• Conceived and established the Defense Cognitive Systems Engineering 2001-2007
  Center under the Dayton-based Wright Brother’s Institute.
• Chief of the USAF Armstrong Laboratory Human Engineering 1991-1997
  Division responsible for breakthrough advances in helmet mounted
  systems, night-vision systems and advanced crew station concepts.
  (VISTA Warrior, Nunn Amendment Program)
• Project Manager: US-Sweden MOU on Air Crew Protection and 1995-2007
  Performance
• Establishing and chaired tri-services/DARPA planning group for Human 1994-1995
  Systems Interface Technologies. Successfully fielded Master Plan for
  the $200M FY95 Program for OSD and Congress.
• Lead the formation of the joint service Reliance Human Systems Interface 1992-1997
  Technology Panel (HSI) and served as first Chairman
• Assembled and managed multi-agency consortia (including Army, Navy, 1980-1991
  Air Force, NASA, FAA, and NATO AGARD) resulting in principal
  funding and support of four major research and analytic study projects.
• Conceived, proposed and founded the Crew System Ergonomics Info 1987-
  2006 Analysis Center (CSERIAC)at Wright-Patterson AFB. An internationally
  recognized, information and technology clearing house for DoD.
PATENTS AND PUBLICATIONS:


CHAIRED WORKSHOPS AND PROFESSIONAL SHORT COURSES

- Chair and prime organizer of the Workshop on “Understanding and influencing the causality of change in complex socio-technical systems. Queensland, Australia. Feb 2011.
- Senior Mentor: Interdisciplinary workshop on society, culture and language, University of Plymouth, UK. Nov 2010.
- Chair & Principal Organizer, The Etiology and Impact of Digital Natives on Societies, Cultures and Commerce. Korean Advanced Institute of Science and Technology (KAIST), Taejeon, SK. November 2009.
• Chair & Principal Organizer, Culture: Affect, Behavior and Cognition. A Multi-disciplinary WS. Lankawi, Malaysia, December 2008
• Director, WS on Organizational Simulation, Clearwater, FL, December 2003
• Director, Strategies for Value WS. Atlanta GA, June 2001
• Director, Getting to Value: Enhancing Quality, Productivity and Innovation; Dayton OH, Nov 2000
• Director, Planning for Innovation WS; Stone Mountain, GA, Feb 2000
• Director, Putting Technology To Work Workshop; Sinclair College, Dayton OH, October, 1998
• Chair: 3-D Surface Anthropometry Working Group. NATO AGARD, April 1993-1995
  Wright-Patterson AFB OH, April 1995
  Universite Rene Descartes a Paris, Paris, France, October 1994
  National Research Council, Ottawa, Canada, April 1994
  Escola Do Servico De Saude Militar, Lisbon, Portugal, October 1993
  DKFZ, Heidelberg, Germany, April 1993
• Director: Short Course - Human Factors: Case Studies & Applications in Engineering Design Crew System Ergonomics Information Analysis Center (CSERIAC). Dayton, OH; June 1990.
• Director: Short Course - Human Engineering Design Considerations for Aircrew Station Modification; NATO AGARD, June 1988.
  Escola Do Servico De Saude Militar, Lisbon, Portugal.
  War Museum. Athens, Greece.
  Delft University of Technology. Delft, Netherlands.
• Director: Integrated Perceptual Information for Designers Workshop. Air Force Institute of Technology, Wright-Patterson AFB, OH; March 1981.

KEYNOTES, INVITED COLLOQUIA AND SPECIAL PRESENTATIONS:


Invited Presentation: Challenges Implementing “Effective” HCIV Solutions in Complex Systems. Fraunhofer Institute, Kaiserslautern GE. March 2009

Invited Keynote Address: Complex Systems Perspective on the Revolution in Human Performance Optimization. Complex 2007, Gold Coast AU


Invited Speaker: MANPRINT: Transforming for the soldier workshop. Arlington, VA. 2004


Invited Capstone Speaker. How abstract is too abstract? How real is too complex? CODATA Euro-American Workshop, “Visualization of Information and Data, Where are We and Where Do We Go From Here?,” Paris, FR. June 1997

Invited Speaker, EuroVis Symposium. University of Kaiserslautern, GE, June 1997


Invited Keynote Address: Complex system interfaces: some chokepoints on the road from theory to applications. IEEE Computer Society Symposium on Human Interaction with Complex Systems. Dayton OH, August 1996


Colloquium: Human Factors in the Wild: A Profile of the Fitts Human Engineering Division. Wright State University, Departments of Human Factors and Computer Sciences, Dayton, OH, April, 1994.

Colloquium: Usefulness and Usability of Human Factors Data: University of Toronto, Canada, December 1993


Invited Address: Integration of Human Factors Research with Systems Development.


- University of Tokyo, Komaba, Tokyo
- University of Kyoto, Kyoto
- University of Osaka, Toyonaka, Osaka
- Aichi Institute of Technology, Toyota
- Hosei University, College of Engineering, Tokyo
- Hitachi Ltd., Kokubunji, Tokyo
- Japanese Auto Research Institute, Tsukuba


