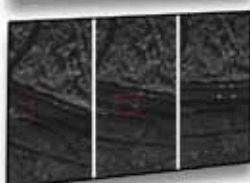DEPUTY UNDER SECRETARY OF DEFENSE
FOR SCIENCE AND TECHNOLOGY

HSCB

HUMAN SOCIAL CULTURE BEHAVIOR MODELING PROGRAM

DEVELOPING INTERCULTURAL ADAPTABILITY IN THE WARFIGHTER

AN OVERVIEW

Developing Intercultural Adaptability in the Warfighter, **a two-day workshop focused on cultural education and training, was held November 4-5, 2009, in Orlando, Florida. The workshop was co-sponsored by the Office of the Secretary of Defense (OSD) HSCB Modeling Program, the Office of Naval Research (ONR), the Combating Terrorism Technical Support Office (CTTSO), and the U.S. Army Research Institute (ARI). The goals of the workshop were to differentiate capability needs and training methods and for attendees to exchange ideas and information.**

The workshop brought together experts who are developing, delivering, and conducting research in cultural training and education. They came from the Department of Defense, other government agencies, industry, and academia, to listen and share ideas with one another.

The workshop was comprised of general sessions and smaller breakout sessions.

The first general session opened with a keynote address from Dr. David Ott, Director, Army Culture and Foreign Language Strategy (ACFLS), U.S. Army Training and Doctrine Command (TRADOC), who discussed ACFLS and the need for collaboration across all Services and coalition forces, both interagency

and intergovernmental. Following the keynote address, Dr. Dick Clark, from the University of Southern California, discussed five principles to consider when developing education and training for cultural knowledge and skills. Other briefings included Foundational Cultural Training by Major Dov Kawamoto, a presentation on the United Kingdom's Defense Center of Support Training, by Lt Col Peter Tarrant, and on the Marine Corps Center for Advanced Operational Culture Learning, by Dr. Paula Holmes-Eber. The second day of the workshop opened with a briefing on Operational Language and Culture Training Systems (OLCTS) by Mr. Martin Bushika, Program Manager of OLCTS. There was also a panel discussion on culture centers, the Air Force Culture and Language Center, and the Institute for Defense Analyses.

The breakout sessions followed four tracks: Analysis, Design, Development, and Implementation and Evaluation. These sessions generated group discussion and collaboration, in which participants identified common challenges and research gaps in current training. Further information on the four tracks can be found on page 8 of this newsletter. The *Developing Intercultural Adaptability in the Warfighter* workshop concluded with an outbrief of the breakout sessions to the general session. More information on this workshop can be found on page 6.

Welcome

Happy New Year and welcome to the fourth issue of the HSCB newsletter. This edition marks a very significant transition point in the HSCB Program. We are entering a new and exciting phase of the Program which is featured in this newsletter. Phase one—which included FY08 and FY09 funding—centered on building a management and operations infrastructure and issuing BAAs to initiate a portfolio of research and development (R&D) efforts. The first phase was highly successful, funding over 50 distinct research efforts and culminating in the HSCB Focus 2010 technical conference this past August.

The second phase of the HSCB Program will focus on refining the investment strategy in order to ensure the portfolio is well-aligned with the Program's technical requirements and to address feedback from customers and the modeling technical community. Additionally, considerable resources will be dedicated to conducting demonstration, integration, and assessment events for the developing technologies. I invite you to read further about the next phase of the Program which is detailed in the feature article.

Also included in this edition are highlights of the outstanding work being funded by the HSCB Program in social and cultural training. The current and future anticipated mission space for the armed forces will require better tools to understand, interpret and respond to adversary, contested and civilian populations in close contact. Training of both specific social-cultural skills and general cultural awareness and sensitivity are needed; specifically needed is training that will provide warfighters with the ability to quickly assess and identify the societal norms, behaviors, and social structures in a social or cultural group. HSCB-related training that provides an understanding of adversarial or neutral populations is needed by military personnel at all levels.

In particular, I would like to draw your attention to the article on the HSCB training workshop held November 4-5, 2009, in Orlando, Florida. Run by the Army Research Institute, the workshop was intended to coordinate efforts, share successes and lessons learned, and identify common challenges in the area of socio-cultural training and education. Participants included representatives from government, industry, and academia who are actively involved in planning, developing, or delivering cultural training and education or in conducting related research. Participating government organizations included professional military and training organizations from all the Services, as well as Combatant Commands, Special Forces, Psychological Operations, and Intelligence organizations.

Together we have reached some significant and impressive milestones in the initial phase of the HSCB Program. I thank you for your hard work and dedication to this effort. The research that you are performing is really about making a difference to those soldiers who are in harm's way and who work with the human, social, and cultural dimensions of military operations on a daily basis. I look forward with great anticipation to the next phase of the HSCB Program where our research investments will begin to bear fruit through the transition of needed technologies to the warfighter.

Dylan Schmorrow
Director, OSD HSCB Modeling Program
Biosystems Associate Director, Office of the Director,
Defense Research and Engineering

FEATURE ARTICLE

The HSCB Modeling Program is a vertically-integrated effort to research, develop, and transition technologies, tools, and systems to Programs of Record (POR) and users in need. It is funded via three Program Elements, one focused on conducting applied research, one on maturing and demonstrating the tools and software outputs of that research, and another on testing and transition of tools and systems to formal acquisition programs and users. The Program exists to support development of capabilities/tools for use in intelligence analysis, operations analysis and decision-making, training, and joint experimentation activities. As the HSCB Modeling Program enters FY10, it commences a new phase where foundational investments in applied research will lead to testable tools, and the pace of technology transition is expected to continue to accelerate. In this article, we highlight the Program's phase one (FY08/09) accomplishments and look ahead to plans and objectives for FY10 and onwards.

Phase One—FY08/09

FY08 was centered on establishing the Program by planning the technical objectives, building a management and operations infrastructure, issuing Broad Agency Announcements (BAAs) to initiate a portfolio of research and development (R&D) efforts, and facilitating exchange within the community of HSCB stakeholders. With that foundation, the Program enjoyed a very active and productive year in FY09, which included the following major accomplishments:

- Establishment of a start-up portfolio of more than 50 projects with HSCB performers in government, industry, and academia.

- Development of partnerships with major HSCB transition programs.

- Aggressive engagement with Combatant Commands (COCOMs) and other operational users.

- Direct support of effort in Afghanistan and other operational objectives.

HSCB PHASE ONE AND TWO SUMMARY

- Two national conferences which connected the diverse research and operational communities involved in defense-related socio-cultural behavior research.

The charts that follow provide some details on the Program in FY08 and 09. Figure 1 shows the distribution of projects by type of performer (project lead). Figure 2 presents the distribution of projects based on the Program technical objectives that they address (note that most projects address more than one of the HSCB Program's technical objectives.)

Some of the specific technical accomplishments of the Program in FY08/09 included:

- Development of an initial Service Oriented Architecture (SOA) that is model-agnostic and supportive of multiple HSCB technologies working in concert.

- Development of visualization methods for the representation of uncertainty in common geospatial tools currently used by the Department of Defense (DoD).

- Demonstration of regional/cultural models in planning exercises through the use of a comprehensive technology evaluation plan tied to warfighter-relevant mission threads.

- Initiation of socio-cultural theory-based training tool projects that leverage commercial investments in Internet-based technologies and DoD investments in training technologies to support HSCB training and mission rehearsal objectives.

- Development of a standards-based data model along with associated cultural map and tabular data sets, assessment of application modeling activities utilizing relevant operational scenarios and realistic data to highlight technology gaps and transition possibilities.

- Development of a prototype capability designed to support COCOM determinations of regional stability, as well as a prototype capability focused on operational planning and intelligence analysis.

- Initiation of development of a target audience analysis and influence analysis capability to support COCOM and DoD strategic communication requirements.

The HSCB Program's first phase culminated in an August conference, *Focus 2010*, which was attended by over 600 individuals from multiple government agencies, industry, and academia. For most of the sponsored projects, it was an opportunity to demonstrate progress. *Focus 2010* was also a venue to exchange information and ideas between Program leadership and members of both the user community and other stakeholders. Altogether, the event gave the Program leadership vital feedback on the overall direction and success of the HSCB Program.
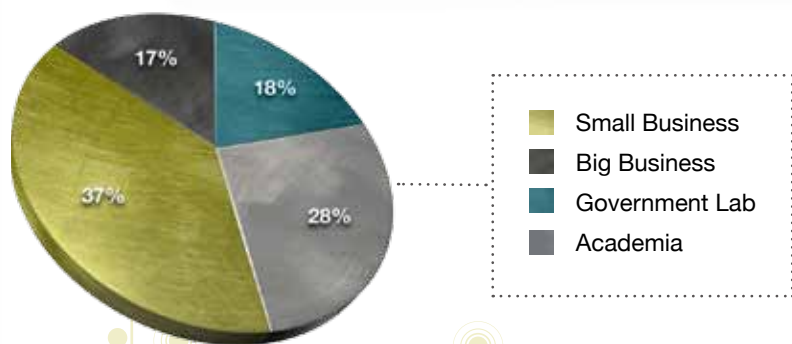
Phase Two—FY2010 and beyond

As the Program enters its second phase, it will continue to maintain focus on conducting leading edge research that can be transitioned into PORs while also addressing near-term needs of the warfighter. Starting in FY10, the HSCB Program is also refining its investment strategy to ensure that its portfolio is well-aligned with the Program's technical requirements and to address feedback from customers and the modeling technical community. The Program will focus considerable effort on conducting demonstration, integration, and assessment events for the developing technologies. We expect to establish technology transition agreements with multiple PORs.
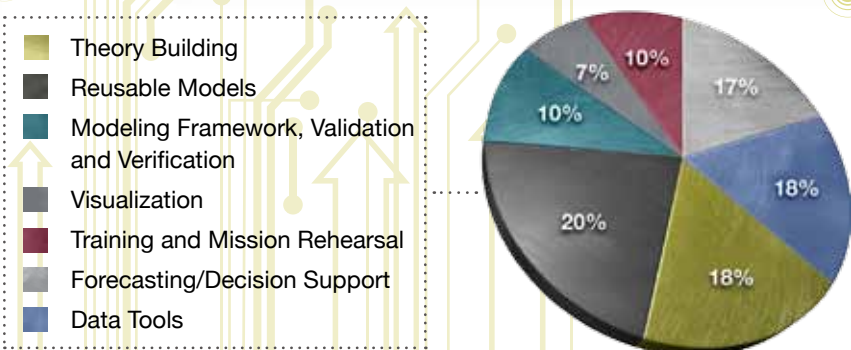
The charts that follow present a snapshot overview of the Program as it enters its second phase. The chart in Figure 3 provides some insight into the Program's multi-disciplinary character. It shows the distribution of disciplines from which project leads are drawn. (Note that because the chart does not account for each effort's support staff, Figure 3 understates the Program's scientific breadth.)

The Program exists to provide support to analysts, operators,

FIGURE 1   HSCB PROGRAM PERFORMERS—FY08/09

- 17%
- 18%
- 37%
- 28%

- Small Business
- Big Business
- Government Lab
- Academia

FIGURE 2   PROJECT DISTRIBUTION ACROSS PROGRAM TECHNICAL REQUIREMENTS—FY08/09

- Theory Building
- Reusable Models
- Modeling Framework, Validation and Verification
- Visualization
- Training and Mission Rehearsal
- Forecasting/Decision Support
- Data Tools

- 10%
- 17%
- 18%
- 18%
- 20%
- 10%
- 7%

HUMAN SOCIAL CULTURE BEHAVIOR MODELING PROGRAM

and decision-makers across four DoD pillars. As indicated in Figure 4, the HSCB Program will support R&D under each pillar, with emphasis on the needs of users in planning and operations. Figure 5 provides further perspective on the Program, showing the distribution of projects across the Program's technical requirements. Also shown (Figure 6) is how the Program's R&D efforts align with research thrusts recommended by the National Research Council (NRC).[1]
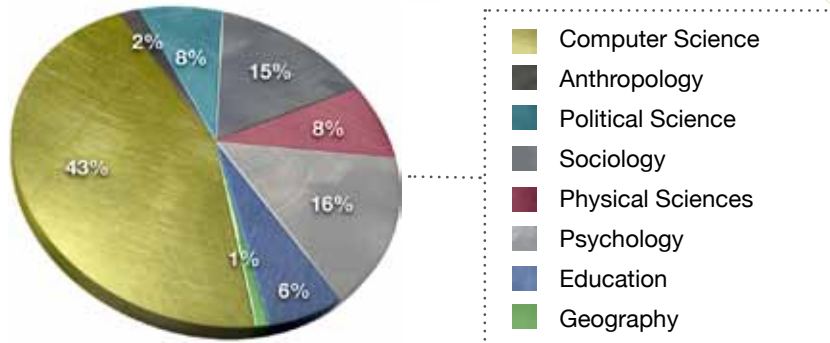
Starting in FY10, the Program has an ambitious set of specific technical objectives,

1. Zacharias, MacMillan and Van Hemel, Editors. *Behavioral Modeling and Simulation: From Individuals to Societies*. National Academies Press. Washington, D.C., 2008.
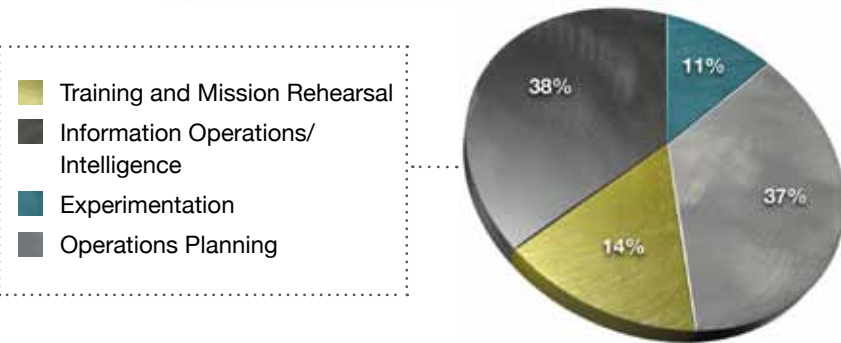
including but not limited to the following:

- Development of visualization tools and infrastructures that display hybrid data sources such as geospatial layers, between individual and group relationships, and related socio-cultural data in ways that are easy for the user to assimilate and that address how evidence is created using provided data and how uncertainty propagates throughout the system.

- Development of a theory to support hybrid, generalizable models which span the spectrum from tactical to operational to strategic.

- Development of technologies capable of leveraging extracted data (e.g. from surveys), processing the data, and validating it, along with examination of metadata technologies for use in multi-purpose/multimodal applications.

- Research and development of model architectures to incorporate emerging theoretic constructs and technologies.

- Demonstration of distributed training technologies to speed the development of socio-cultural skills of coalitions in current military operations.

- Certification that HSCB model-based technology can be transitioned into existing and developing systems in coordination with Program Executive Offices/Program Managers, joint users, and other transition customers.
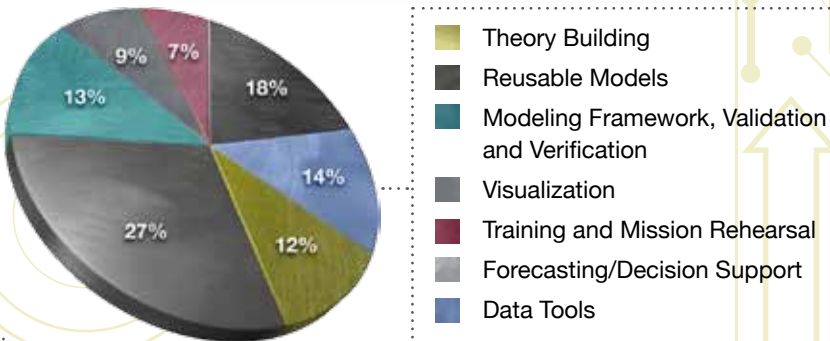
Serving the Greater HSCB Modeling Community

The OSD HSCB Modeling Program also exists to support improved awareness and coordination across the multi-agency community that is doing research and development work centered on modeling socio-cultural behavior. We offer Figure 7 as an effort to represent that community, which is very large, active, and growing quickly. No such rendering can be definitive or final, but this shows many of the programs that the services, commands, and other elements of the DoD and US Government have in the socio-cultural modeling arena, particularly working on the foundations of data, theory, and model building. Moving forward, it will be important to ensure effective coordination between

FIGURE 3 DISCIPLINES REPRESENTED IN HSCB PROJECTS

- Computer Science
- Anthropology
- Political Science
- Sociology
- Physical Sciences
- Psychology
- Education
- Geography

FIGURE 4 SUPPORT OF HSCB PROJECTS FOR DEFENSE PILLARS

- Training and Mission Rehearsal
- Information Operations/Intelligence
- Experimentation
- Operations Planning

FIGURE 5 PROJECT DISTRIBUTION ACROSS PROGRAM TECHNICAL REQUIREMENTS—FY10

- Theory Building
- Reusable Models
- Modeling Framework, Validation and Verification
- Visualization
- Training and Mission Rehearsal
- Forecasting/Decision Support
- Data Tools

FIGURE 6 — ALIGNMENT OF HSCB PROJECTS WITH NRC THRUST AREAS

Pie chart values: 30%, 16%, 17%, 11%, 16%, 10%

Legend:
- Uncertainty, Dynamic Adaptability, and Rational Behavior
- Data Collection Methods
- Federated Models
- Model Validation and Usefulness
- Model Building Tools and Infrastructure
- Theory Development
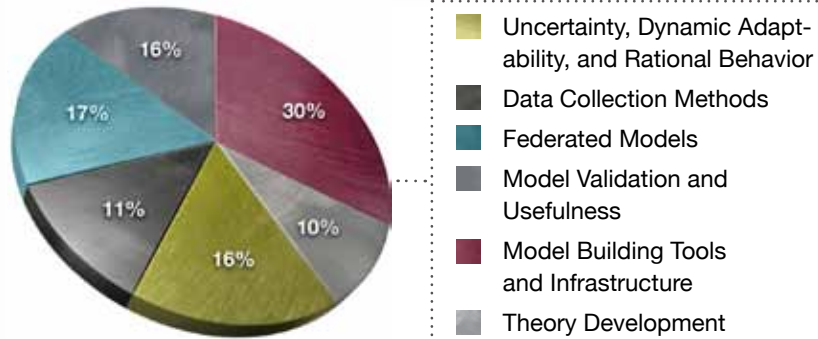
the HSCB Program--which starts with applied research--and the many programs that are conducting basic research. These include, but are not limited to, the Air Force Research Lab, the Office of Naval Research, and the Small Business Innovation Research Program. It is also important to stay abreast of the accomplishments from within the academic and technical communities, including through professional conferences. To that end, the HSCB Program has established a Senior Technical Experts Group with members drawn from across the academy, technical boards, DoD, and the inter-agency community.

Conclusion

As the Program moves into its second phase, the challenges we face are considerable—but so are the opportunities. We will continue to support rigorous, collaborative, multi-disciplinary research, generating tools with generalizability across domains, environments, and levels. It will be essential to build transparency into the models and tools sufficient for users and decision-makers to effectively utilize and have trust in them. We also recognize that doctrine and mission rehearsal venues will need to be developed to ensure that decision-makers are sensitive to the capabilities and limits of using models for operational planning. The HSCB Modeling Program can continue to be a source of technology development and for helping to further integrate the broader communities which work to leverage computational modeling for understanding and successful navigation of the human terrain.

FIGURE 7 — SOCIO-CULTURAL BEHAVIOR MODELING: A MULTI-AGENCY RESEARCH AND DEVELOPMENT COMMUNITY

Category	Project	Data & Theory Building	Models & Software	Model Building Resources & V&V	Integration & Systems Development	Training & Mission Rehearsal	Operational Use & Transition
Armed Services	Socio-Cultural Modeling of Effective Influence (AFRL)						
Armed Services	Collective Behavior and Socio-Cultural Modeling (AFRL)						
Armed Services	Predicting Adversary Behavior (AFRL)						
Armed Services	HSB Basic and Applied Research (ARI)						
Armed Services	Network Science Research (ARI)						
Armed Services	Human Dimension Research Program (ARL)						
Armed Services	Measuring Progress in Conflict Environments (USACE)						
Armed Services	Geospatial Methods (USACE)						
Armed Services	Marine Corps Intelligence Activity (USMC)						
Armed Services	ONR HSCB Science (ONR)						
OSD/DDR&E	Human Social Culture Behavior Modeling (DDR&E)						
OSD/DDR&E	Joint Capability Technology Demonstration (DDR&E)						
OSD/DDR&E	Minerva Research Initiative (OSD)						
OSD/DDR&E	Multidisciplinary University Research Initiative (OSD)						
OSD/DDR&E	Integrated Conflict Early Warning System (DARPA)						
OSD/DDR&E	Technologies for Applications of Social Computing (DARPA)						
OSD/DDR&E	Strategic Communication Assessment and Analysis Systems (DARPA)						
OSD/DDR&E	Conflict Modeling, Planning, and Outcomes Experimentation (DARPA)						
Agencies	Socio-Cultural Dynamics Initiative (DIA)						
Agencies	Behavioral/Social Sciences Research Program (DIA)						
Agencies	Integrated Adversarial Social Network Theory (DTRA)						
Agencies	Social-Science Research for Anticipation & Reduction of WMD (DTRA)						
Joint Commands	ATHENA (TRISA)						
Joint Commands	Human Terrain System (TRADOC)						
Joint Commands	SOCOM Intel and IO (SOCOM)						
Joint Commands	Social Dynamics Awareness (JIEDDO)						
Joint Commands	Socio-Cultural Initiatives COCOMs (COCOM)						
Other Government	Social/Behavioral Dimensions of Security, Conflict, Cooperation (NSF)						
Other Government	Interagency						
Other Government	International						
Other Government	Socio-Cultural Content in Language (IARPA)						
Other Government	Reynard (IARPA)						
Other Government	Trust (IARPA)						

DEVELOPING INTERCULTURAL ADAPTABILITY IN THE WARFIGHTER

A Workshop on Cultural Training and Education

A workshop on HSCB training was held November 4-5, 2009, in Orlando, Florida. Entitled 'Developing Intercultural Adaptability in the Warfighter,' this workshop was intended to coordinate efforts, share successes and lessons learned, and identify common challenges in the area of sociocultural training and education. The focus of this two-day event was the instructional design process as applied to cultural training and education. Participants included representatives from government, industry, and academia who are actively involved in planning, developing, or delivering cultural training and education or in conducting related research. Participating government organizations included professional military and training organizations from all the Services, as well as Combatant Commands, Special Forces, Psychological Operations, and Intelligence schools or organizations. Participants attended plenary session presentations from some of these programs and organizations. Breakout sessions examined aspects of the instructional design process in greater detail, with parallel tracks on analysis, design, development, and implementation and evaluation. (More information on the breakout sessions can be found on page 8 of this newsletter).

In the plenary sessions, representatives from the Services' culture centers and programs discussed their strategies for and challenges in providing cultural training and education. To differing degrees, all of the Services have a culture-general component and a culture-specific component to cultural training and education for general-purpose forces, and each faces challenges in incorporating culture content into training schedules that are already densely packed. This point was highlighted by Major Dov Kawamoto, who provided a concrete example from his experience training advisors for the Marine Corps Special Operations Command. Several speakers addressed the issue of limited time and resources in suggesting partnerships across Services, federal departments and agencies, and academic institutions that would enable organizations to leverage related efforts. Echoing these concerns, Lieutenant Colonel Peter Tarrant from the Defence Centre of Training Support described ongoing efforts in the United Kingdom to confront a very similar set of cultural training challenges.

Speakers identified other concerns, such as the unique needs and expectations of the training audience described by Paula Holmes-Eber (Marine Corps University and Center for Advanced Operational Culture Learning). Whereas the Marine Corps faces challenges associated with training large numbers of relatively junior personnel, David Brand (John F. Kennedy Special Warfare Center and School) identified some challenges for training the smaller pool of special operating forces to an intermediate or advanced level of cultural expertise. These presentations demonstrated that a one-size-fits-all approach to cultural training will not meet the needs of different missions and personnel, a point that emerged in breakout discussions as well.

Other presenters in the plenary sessions included Dr. Dick Clark (Center for Cognitive Technology, University of Southern California) and Dr. Dexter Fletcher (Institute for Defense Analyses), who discussed principles of instructional design and technology for cultural training. Dr. Clark discussed the importance of conducting cognitive task analysis to help reveal the impact of culture on military operations. Because culture is largely automated and unconscious, other methods to identify training needs may only reflect a small proportion of the performance domain. These presentations also highlighted the importance of understanding the learner. The learner's own cultural background and prior knowledge must be considered. An understanding of one's own culture facilitates learning about other cultures, and by building on the learner's prior knowledge and experiences, training can be more appropriate and efficient.

These considerations can also help minimize resistance and overconfidence in the learner.

Speakers also addressed the challenge of training and educating for the unknown. We cannot always predict with precision what operations military personnel will be asked to do in the future, or where those operations will take place. To prepare for uncertain circumstances, training can offer varied practice, by generating novel situations in scenario-based training and presenting variations in context. Flexible training platforms can also enhance adaptability for uncertain or ambiguous circumstances, by offering authoring tools that allow for easy tailoring of content or training scenarios. These tools can help reduce the time and expense of developing training for a changing operational environment.

Breakout sessions at the workshop covered challenges for various stages of the instructional design process for cultural training and education. Each session was led by two presenters from government, academia, or industry whose work has addressed the topic challenge. The presenters then led a discussion of the topic in which they solicited other suggestions for dealing with the topic challenge and identified further challenges and research gaps.

Discussions in these sessions identified many areas of controversy, such as the extent to which training should take a regionalist vs. an interculturalist approach. That is, should training target learning for a specific culture or particular mission, or place more emphasis on learning principles or skills that can generalize to different cultures? Another area of disagreement was the extent to which effective performance in a foreign culture has an affective component (e.g., attitudes or motivation). Some participants argued that changing trainee motivation or attitudes is critical to enable cultural learning, whereas others suggested that changing trainee behavior, without addressing attitudes, may be sufficient. Learning goals related to culture may differ in professional military training from those in unit-focused or other pre-deployment training, but there was no clear consensus on what each should target.

In addition to the training content, the training method was also controversial. Participants disagreed about the potential utility of gaming and simulation where the learning objectives are cultural and interpersonal in nature, rather than tactical or operational. Discussions cited a broad base of research literature, from social psychology, education and other learning sciences, intercultural communications and management, but on many topics, empirical research is not yet available from military contexts to provide convincing evidence.

Consensus emerged around the importance of conducting training evaluation and assessing training effectiveness and efficiency. Participants seemed to agree that training evaluation is an important component of instructional design and should be a consideration throughout the design process. Participants also noted a need for assessment tools to be used in training evaluation, so that evaluation can address trainee learning and transfer, not just trainee reactions, as is often the case. Other forms of assessment are also important. Whereas training *evaluation* demonstrates training's impact on the individual, assessing training *effectiveness* helps reveal whether training is an effective solution to the organizational problem that prompted it. Determining effectiveness depends on the clear identification of performance indicators and on the availability of measures of mission success.

Training for military personnel should also be *efficient*, producing the desired effects on learning and performance using only the time and resources that are necessary. Training efficiency invites comparisons of different training methods and media, in an effort to find training technologies that minimize costs and demands on personnel time. Dexter Fletcher addressed this issue in his closing remarks, suggesting that training designers consider return on investment, asking both whether training works, and also is it worth it? This is a gap needing additional attention, as very few current research efforts include an evaluation component, and is critical to resolving some of the controversies described above.

Discussions identified other areas where additional research would be beneficial. One of these gaps is research to develop models and taxonomies to inform cultural training. Taxonomies of cultural differences relevant to military operations are one type of model needed. Existing taxonomies, such as Hofstede, were discussed, but some participants expressed skepticism of their validity and applicability. Other models needed are models of the learner or user. These models are critical to developing training that accommodates the learner's prior experiences and skill levels, yet have not been systematically investigated in military personnel. Workshop participants also expressed interest in instruction that is tailored for specific roles and missions and argued against "one-size-fits-all" cultural training. However, it was generally acknowledged that we lack a clear understanding of how the needs of different personnel may differ; suggesting further research is needed to determine the training requirements for general purpose forces and for critical specialist occupations.

Though few areas of clear consensus emerged, there was striking consistency in the challenges and research gaps identified across session tracks. Issues of analysis and evaluation arose repeatedly, even in sessions focused on design and development issues. Discussions often drew on literatures addressing cultural learning and performance outside the defense sector, or addressing training issues in learning domains other than culture, demonstrating a rich foundation of methods to help address the challenges. As Martin Bushika noted in his presentation, cultural training in the military is at "the end of the beginning," and the groundwork has been laid for coordinated research to answer these questions.

The Developing Intercultural Adaptability in the Warfighter workshop was, in part, comprised of four sessions which focused on Analysis, Design, Development, and Implementation and Evaluation. Workshop attendees had the option to choose which one to attend and were able to participate in various sessions across the different focus areas throughout the two-day workshop. Each session consisted of presentations from the Services, academia, or industry and included group discussion which focused on gaps and future needs. Short summaries of each of the sessions are below.

1 Analysis

The first Analysis breakout session opened with a discussion on cross-cultural competency (C3), including what efforts are already underway within the community at large. The session divided into five breakout groups to better tackle the need for a shared cross-cultural competency map.

The second breakout session began with a briefing on mission effectiveness in terms of cross-cultural competence, which was followed by a briefing on cultural agility research in corporate America. Attendees took part in an open dialogue on cultural agility, which looked at current gaps and future training possibilities. They discussed the hardwiring of a person versus the ability to train an individual; the significance of motivational factors to learn about foreign cultures; the value of inherent personality, and potential methods to evaluate and select persons who will best adapt to foreign culture and language. They also discussed the importance of teaching culture as a life-saving skill.

On the second day of the workshop, the Analysis session looked at unit mission to focus on leadership development. It is important to focus on methods for looking at mission performance and the accompanying cultural aspects. The Analysis session also discussed the cultural capabilities needed for different missions and effective performance as well as training versus other methods used to achieve cultural effectiveness. One session focused on methodology: what is out there, what the community can use, and what the next steps are.

The final Analysis breakout session discussed the need to understand how individuals learn cross-cultural communication (C3). Attendees discussed the need to show consistency within training and to identify the right training for the right person for the right location at the right time.

2 Design

The Design session began by looking at the goal of cultural training: to maximize training transfer. They looked at the best way to do this for adaptive tasks where the situation is continuously changing. During the first session, the group used Merrill's 5 Principles as the key to create retrieval cues. They discussed how discovery and error-based learning is good for adaptive training because trainees can see how and where they make mistakes. Intercultural adaptability means focusing on effective change in response to environmental changes. As the culture changes, individuals must adapt to the changes. Attendees also discussed computer-based training and looked at cultural taxonomy. They discussed how to find the taxonomy of cultural dimensions in order to drive underpinnings of various cultural initiatives. Attendees agreed there is no widely accepted taxonomy to date.

Another breakout session looked at how the United States Military Academy (USMA) is trying to produce 2nd Lieutenants who hold general culture skills necessary to succeed in their military careers. To aid in this, the USMA offers cross-cultural competency courses in foreign countries during school breaks, to provide Cadets the opportunity to learn a language, to complement their knowledge, and to help build the skills and self-confidence to best handle foreign cultures.

Another session of the Design group focused on how cultural adaptability affects mission success from the business world and the lessons learned. In particular, it focused on a cycle that allows people to react properly to a foreign culture. However, this model contains missing links, necessary to understand how to act in a culture-specific situation.

The final Design session looked at how to translate intercultural competencies into learning objectives. Attendees worked in smaller breakout groups to create training paradigms to teach Knowledge, Skills, and Abilities (SKAs) to teach a specific task.
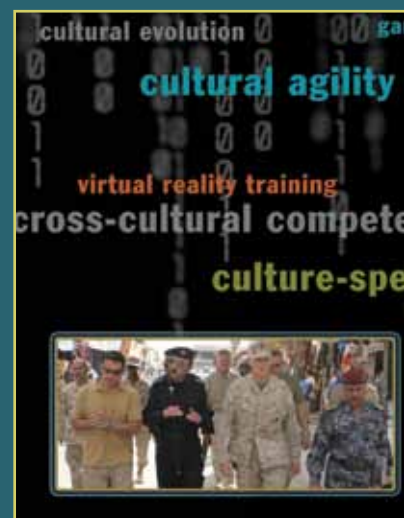
3 Development

The first session of the Development group looked at research in ethnography and how to use it to educate people on culture. For example, narratives have been used in virtual reality training systems and are now being applied as an ethnographic approach to help develop elements of curriculum and course content. Attendees discussed the significance of narration by soldiers who have recently returned from deployment.

The second Development session looked at what is needed to move the U.S. Army from a traditional training design developed by Subject Matter Experts, to an empirically-based and tested system which utilizes the latest findings in training research. The second part of this session looked at the most effective ways to provide pedagogical support in an immersive learning environment, such as putting the learner's goal on the screen in front of him, rather than requiring him to memorize it.

During the third Development session, attendees looked at theoretical foundations for developing virtual humans used for training and simulation, and how to design virtual humans, so that they have skills in negotiation, language and human communication.

The final Development breakout session looked at ways to maximize Subject Matter Experts and cultural informers for training. It is important to know what kind of information operators need, and to continuously use experts to ensure validity in information received. This process is iterative and requires constant review in order to ensure the content is still timely and relevant.

It is also important to find what aspect of culture to train to, so that training methods can match the content. Concluding the session, the group discussed the importance of keeping training up to date with cultures, as they evolve over time.

4 Implementation and Evaluation

The Implementation and Evaluation session began by discussing the Air Force Culture and Language Center, whose goal is to implement cross-cultural competence across the Air Force. The Air Force has specific challenges, but continuously reinforces education throughout an airman's career. The Center focuses on training three critical skills: Relate, Communicate, Negotiate.

Next, the group looked at the impact of cultural training on readiness and mission performance, with attention focused on gaps in current evaluation models, such as the tendency to measure reactions rather than learning. The group discussed the need for evaluations and training to have clear goals and purposes.

The second breakout session included a presentation on articulating an expert schema to understand culture, which could be used as a training evaluation.

The Implementation and Evaluation session also looked at regional understanding, including assessment using a General Regional Aptitude Test (GRANT). Regional competence is the most comprehensive part of cadet training and due to its complexity, is also the most difficult to understand and evaluate.

The final breakout session looked at ways to design and conduct training evaluations. The primary goal of training is the transfer of knowledge, but there is always a problem of retention. Presentations focused on game-based training designed to teach bilateral negotiations in an Iraq cultural context.

SPOTLIGHT / DOUG NELSON

What Doug Nelson thought would be a brief detour from his plan to attend law school turned out instead to be a direct route to his work developing games to teach culture and language. After completing his B.A. in East Asian Studies at Yale University, he accepted a two-year fellowship from the Yale-China program to teach at the Chinese University of Hong Kong. He spent the summer between the school years living and working in an impoverished squatter community, improving his Cantonese by volunteering with residents during the day and honing his game skills by playing mahjong with them at night.

After the fellowship he parlayed his experience into a business development position with Apple Computer, which was actively expanding its reach in Asia. Traveling throughout the region gave him more experience working across languages and cultures, and the company introduced him to the importance of user experience in product design. A subsequent stint running a language software company in Tokyo helped him build his fluency in Japanese (and further his games research at the cutting-edge arcade next to his office). When he finally returned home to the United States, the idea of going to law school had lost its appeal. Nelson decided to start a company to help organizations solve their training challenges using games and simulations.

"THE [HSCB] PROGRAM WAS LOOKING FOR SOLUTIONS TO INFLUENCE POPULATIONS," NELSON NOTICED. "IN LISTENING TO THE STORIES OF SOLDIERS RECENTLY RETURNED FROM IRAQ AND AFGHANISTAN, I REALIZED THAT THE CONTACTS TAKING PLACE AT THE INDIVIDUAL LEVEL OFFERED A KEY LEVERAGE POINT FOR POSITIVE INFLUENCE."

"Games allow learners to practice in relevant contexts," says Nelson, "with motivating elements of challenge and, to use a loaded word, fun." Nelson's company, Kinection, is a creative studio staffed by instructional and game designers, researchers, and technical consultants. When tackling training challenges, Kinection uses a design heuristic of three principles: 1) focus on competencies and performance objectives; 2) tailor the learning to the individual; and 3) provide opportunities for practice in context. The last principle is where games shine, says Nelson.

The approach has resonated with clients in the corporate, military, and nonprofit sectors. When the Naval Postgraduate School needed help making statistics relevant to Naval officers, Kinection designed a rescue mission that requires officers to calculate the resources they need to mobilize, given differing probabilities of losses during the mission. When a community nonprofit needed to train organizers to go door-to-door, Kinection devised *The Organizing Game*, which allows trainees to practice specific skills before hitting the streets. This game proved so useful that it was featured by *Time Magazine* as an example of the potential of games for serious learning applications.

Nelson has looked forward to bringing Kinection's game-based learning expertise to bear on culture and language training for many years, and he's now doing so with the HSCB Program. Kinection's *Task-based Communications Training System*, aims to equip warfighters with the verbal and nonverbal skills they need to build rapport, interpret behavior, and perform simple tasks with local counterparts. "The Program was looking for solutions to influence populations," Nelson noticed. "In listening to the stories of soldiers recently returned from Iraq and Afghanistan, I realized that the contacts taking place at the individual level offered a key leverage point for positive influence. The soldiers saw this, and were frustrated that their language and culture training didn't cover the kinds of day-to-day interactions they had with the locals, or the varied kinds of tasks that they were required to perform."

Individualized training focused on the trainees' specific roles is a key innovation in the solution. "A Hospital Corpsman needs to quickly establish rapport and talk about bodies and injuries," Nelson observes. "An MP needs to be able to produce understandable commands for individuals and groups. The vocabulary, gestures, listening skills, speaking skills and contexts in which they must put their skills to use vary extensively." Following its three design principles, Kinection's team begins by establishing the competencies required for each role, and designs learning approaches and game structures that support these performance requirements.

The same focus is given to the individual learner: What skills does the learner have already? How does the learner prefer to learn? Where will he or she be learning, and under what conditions? "Outside of the classroom, we no longer need a one-size-fits-all training approach", says Nelson. "We can tailor learning to individual needs, interests, expertise, and learning styles."

Serious games provide challenges, positive reinforcement, dynamic levels of difficulty, and competition – all elements that encourage trainees to spend more time learning and practicing new skills. Nelson believes that by incorporating these elements, Kinection's HSCB efforts will be successful at helping soldiers improve their communication and influence skills, given that the solution focuses on something every warfighter understands: the task at hand.

Doug Nelson can be reached at doug@kinection.com. More information about Kinection's culture and language training can be found at www.worldwarfighter.com.

ALICIA SAGAE

Alicia Sagae is a Research Scientist at Alelo Inc., a Los Angeles software company that creates Serious Game technology for language and culture training. Since August 2008, Alicia has helped the company expand its research agenda in natural language processing, dialogue modeling, learner modeling, and socio-cultural simulation. She is a PI of the HSCB project "Commonsense Socio-Cultural Models for Culture Training in Serious Games (CultureCom)", sponsored by the Office of Naval Research. She also contributes to two upcoming projects in the domain of human socio-cultural behavior, sponsored by DARPA; "C-CORE: A Framework for Workflows in Cultural Content, Ontology, and Resource Engineering" and "C-Game: Using Serious Games for Immersion Training in Virtual Environments."

These efforts take advantage of Alelo's unique research environment. Alelo explores scientific boundaries in support of human communication, while also deploying its software to thousands of users worldwide. The Alelo product portfolio started as a research project at the University of Southern California's Information Sciences Institute (ISI). Directed by its President and Chief Scientist, Dr. W. Lewis Johnson, and its CEO, Dr. Andre Valente, Alelo continues to value scientific investigation, collaborating with experts from ISI, the University of Pennsylvania, Cornell University, and Yale University, among others. Alelo also sustains positive relationships with military training facilities where its systems are tested by military personnel. The connection helps Alelo analyze how software affects the learning experience, a critical concern for performers and sponsors of HSCB projects.

This environment drew Alicia to the company from an academic background in computation and human language. She holds a Bachelor of Science in Mathematical Sciences and Slavic Linguistics from the University of North Carolina at Chapel Hill (2000), and a Master of Science from the Language Technologies Institute of Carnegie Mellon University (2002). At CMU, Alicia contributed to the ground-breaking statistical machine translation (SMT) systems that Carnegie Mellon developed under the DARPA TIDES Program.

Alicia expanded the scope of her research in her appointment as a Visiting Researcher at the University of Karlsruhe, Germany. She published work addressing word overlap and morphology in SMT alignment lattices, and managed projects that applied her technology to new languages and domains. She also became engaged in the translation evaluation community as a member of the Steering Committee on Evaluation for the C-Star Consortium (c-star.org).

Throughout this work Alicia aimed to synergize empirical and knowledge-based approaches. For many human language technologies, state-of-the-art results have been achieved using simplified features of language, annotated over million-word corpora. However, as these application areas continue to mature, researchers are exploring more sophisticated feature representations. This search for the right representation often leads back to basic theories of communication from the social sciences, an insight that informs Alicia's work at Alelo on the HSCB CultureCom project.

CultureCom is motivated by the observation that effective communication requires the ability to translate cultural knowledge into appropriate real-time behavior. This observation is consistent with the findings of the Defense Regional and Cultural Capabilities Assessment Working Group Subgroup 2 (RACCA WG SG2), which identified core competencies including cultural skills, cultural knowledge, and personal characteristics. CultureCom supports trainees in the mastery of cultural skills by delivering an enriched practice environment, including spoken interactions with culturally-aware conversational virtual humans. The project extends Alelo's social simulation technology by enriching the software representation of cultural constraints on real-time dialogue behavior.

To meet this goal, Alicia leads a team of collaborators with expertise in cultural anthropology, artificial intelligence, and serious game technology. Dr. Michael Agar, professor emeritus at the University of Maryland, College Park and author of Language Shock: Understanding the Culture of Conversation, contributes to the formalization of a micro-sociological model. Dr. Jerry R. Hobbs, Fellow of the American Association for Artificial Intelligence and author of Literature and Cognition, endeavors to merge this model with a logic-based framework for behavioral inference. Alicia Sagae applies her skill and experience in language technologies to realize this framework as a layer of dialogue constraints within Alelo's conversational virtual human architecture. She also directs the project toward quantifiable assessment objectives based on comparisons between predicted and actual system behavior in controlled-input dialogues.

Throughout the project, the team balances responsible social science with of state-of-the-art technology development. Dr. Agar summarizes these efforts as follows: "CultureCom is one of the more interesting and challenging projects I've worked on. It means to integrate artificial intelligence and anthropology to create software that develops cultural sophistication in its users. Alicia Sagae, with her intelligence, curiosity and open-minded approach to the challenge, is the perfect person to bring all the pieces together."

Alicia is also currently writing her doctoral dissertation under the advisement of Dr. Scott E. Fahlman of Carnegie Mellon University. In her thesis work she applied knowledge-based semantic analysis techniques to textual descriptions of web images in a system for natural-language image retrieval. This work supports a recurring theme in Alicia's research agenda: creating knowledgeable systems that interact with humans on human terms, enabling users to communicate more effectively with machines and with each other. Alicia continues to pursue that goal with Alelo.

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Date	Event	Location	Sponsor	Website
March 22–25, 2010	Behavior Representation in Modeling and Simulation (BRIMS)	Charleston, SC	AFRL, ARI, ARL, ONR, NSC, NASA, MoD	**http://brimsconference.org**
April 19–21, 2010	Culture Summit IV	Tucson, AZ	TRADOC	
July 17–20, 2010	2010 AHFE International 3rd International Conference on Applied Human Factors and Ergonomics *Jointly with* 1st International Conference on Human Factors and Ergonomics in Healthcare 1st International Conference on Cross-Cultural Decision Making 13th International Conference on Human Aspects of Advanced Manufacturing	Miami, FL		**www.ahfe2010.org**

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