

**Deborah Vakas Duong, Ph.D.**  
(571)276-8270  
deborahvakasduong@gmail.com

*US Citizen with a TS/SCI CI Poly Security Clearance*

## ***HIGHLIGHTS***

- Invented world's first Cognitive Agent Social Simulation, 1991. The Economist reported on my early work.
- Invented three simulations and three analysis tools used in major studies of the US Department of Defense: Nexus Network Learner, Nexus Schema Learner, SIMmiddleware, Oz, Indra, and the Commander's Behavior Model.
- 25 years experience as a Computational Social Scientist, creating Social Simulations with AI for the Department of Defense, Intelligence Community, and Health Insurance industry.
- 2014 Chair of Social Science working group for the Military Operations Research Society (MORS), the US Department of Defense and US Intelligence Community's main forum for analysis.
- Current work in Data Absorption using Co-evolution is a promising technique to model social phenomena automatically using Big Data with data driven agents.

## ***MAJOR AREAS OF INTEREST and EXPERIENCE***

- Computational Social Science, Sociological Simulation, Economics Simulation
- Complexity, Agent-Based Simulation, Social Network Analysis, Complex Adaptive Systems, Complexification and System Formation
- Simulation Validation, Simulation Interoperability, Computational Science
- Artificial Intelligence (AI), Evolutionary Computation, Co-evolution, Fuzzy Systems, Neural Networks, Bayesian Networks, Markov Processes, Reinforcement Learning, Data Mining, Natural Language Processing (NLP), Semantic Web, Rule Based Systems.
- Irregular Warfare (IW) and Information Operations (IO) Analysis, Course of Action (COA) Analysis, Command and Control (C2), Human Behavioral Representation (HBR). Analysis which centers on the welfare of the population.

## ***PROFESSIONAL EXPERIENCE***

**Software Development Architect**, DST Health Solutions. Birmingham, Alabama.  
12/11 – present.

- Analysis of claims data with Bayesian Networks, Markov Processes, and Agent Based Simulations for Predictive Analytics of Health Care Management. Netica, Groovy, Java, Esper, REST Web Services, John Hopkins ACG, SQL, Microsoft

SQL Server, Microsoft Access, MySql, Teiid, Weka, R, XBM, Nexus (my software), Maven, JasperReports, Eclipse, Enterprise Optimizer. Data Mining, Optimization.

**Senior Operations Research Analyst,** Augustine Consulting. Monterey, California. 10/09 – 12/11.

- AI Software Engineer/Computational Social Scientist at US Army Training and Doctrine Analysis Center-Monterey (TRAC).
- Design Team for the Human Social Cultural And Behavioral (HSCB) EXtensible Behavioral Modeling Open Source Framework (XBM). Open Source Contributions.
- Invented, won funds for, designed, developed and led team of five in development of TRAC's Social Impact Model middleware analysis and validation tool (SIMmiddleware) in two projects. SIMmiddleware embodies a method of computational social science. Technical Report at <http://www.scs.gmu.edu/~dduong/SimTechnicalReport.pdf>.
  - Invented, designed, and developed Strategic Data Farming methodology of COA optimization. Invented and designed modeling of Deception for Information Operations (IO). Principal Investigator.
  - Invented, designed, and developed the use of probabilistic ontologies and Markov processes for model integration, analysis and validation (Java, Jena, Protégé, Netbeans). Principal Investigator.
- Invented, won funds for, designed and developed TRAC's Nexus agent based model of Key Leader engagements and dynamic High Valued Individual (HVI) social role networks (Java, Weka, Groovy, Repast, Eclipse, MS Access, MS SQL). Technical report at <http://www.scs.gmu.edu/~dduong/NexusTechnicalReport.pdf>.
- Won the 2011 Army Modeling and Simulation Award: Army-Wide Team Analysis, for work on the Irregular Warfare Tactical Wargame (TWG). Nexus, SIMmiddleware, and Oz are key components of TWG.
- Validation Team and contributor to TRAC's Best Practices Guide for Validation of Irregular Warfare Models.

**Senior Computational Social Scientist,** SAIC, Arlington, Virginia. 10/06 – 10/09.

- AI Software Engineer/Analyst at OSD/PA&E SAC, Office of the Secretary of Defense / Program Analysis and Evaluation / Simulation Analysis Center.
- Used Agent Based Simulation, System Dynamics, and War Gaming to explore the social effects of whole of government US actions for Irregular Warfare.
- Invented, designed, and implemented Nexus, a set of intelligent agent models using Evolutionary Computation (Coevolving Bayesian Optimization Algorithms), Reinforcement Learning, Bayesian Networks, Social Role Networks and the Boltzmann Machine Constraint Satisfaction Neural Network to simulate interpretive social science (Java, Groovy, Repast, Weka).
- Invented, designed, and led implementation of Oz, a War-game Integration Toolkit, using OWL ontologies to integrate models, data, and human-in-the-loop for analysis (Java, Jena, Protege).

- Designed the Africa Study, the DoD's first IW analytical baseline. The Africa Study used Oz to record moves and Nexus to model corruption and popular support. Validation Team.

**Independent Contractor AI Software Engineer/Analyst**, Agent Based Learning Systems, Annandale, Virginia 01/06 – 1/08.

- Invented, designed and implemented Indra, a Natural Language Engine that extracts ontologies of roles and role relations from free text for the US Army Intelligence and Information Warfare Directorate (I2WD). (Java, OpenNLP, Lucene, Gate).

**Research Scientist**, Virginia Tech Applied Laboratory for National and Homeland Security, Arlington, Virginia. 01/06 – 10/06.

- Applied Natural Language Processing, Artificial Intelligence, and Simulation to National and Homeland Security.
- Invented designed and implemented voting system of open source parsers weighted with Support Vector Machines (SVMLite).

**Senior Software Engineer/ Senior AI Engineer**, SAIC, Alexandria, Virginia. 10/01 – 01/06. US Army Intelligence Command (INSCOM).

- Natural Language and Social Network solutions for ontological classification and interpretation of INSCOM's terabyte of secret messages.
- Invented, won DARPA funds for, and led design of the Mutual Information Contextual Concept Extractor (MICCE), a Natural Language Processing (NLP) system that uses principles of social networks, information theory and complexity to extract roles and role-relations directly from text (UIMA).
- Designed and implemented Java Grindstone Regular Expression Parser, the main parser used by the Army JIOC worldwide to parse messages 2004-06 (Java, JBOSS).
- C2 and HBR in MATREX Grid Based Army Simulation: Invented and designed a Course of Action analysis system for maneuver warfare, in which coevolving autonomous agents learn to play GO. Agents sell services to move on and perceive parts of the board. They start out as generalists and gradually specialize by playing tournaments, at first many small and later a few large with many agents on each side.
- Analyst's Query System (AQS) for Army's Intelligence Command, INSCOM: Invented, designed, prototyped and implemented knowledge discovery system that combines Fuzzy Expert Systems with Certainty Factors to measure degree of pattern match. It was interfaced to a Latent Semantic Indexing (LSI/LSA) system to measure international media responses to the Global War on Terror (Java).
- Invented, designed, and implemented system of voting open source entity extractors, text signature algorithm for deduping, and coreference resolution across documents (Java).

**Computational Behavioral Scientist, Lead/ Senior Cognitive Scientist, CACI,** Arlington, Virginia 1/99 – 10/01.

- Principal Investigator. Invented, won funds for, designed, and lead implementation of Commander's Behavior Model (CBM) COA Selection Module for land component of JWARS (JAS), Central DOD Simulation of Joint Theatre-level warfare. Game tree with a fuzzy expert system, giving partial memberships to movements that "seem close to" standard patterns of maneuver. Uncertainty, second order perception, and commander's personality are taken into account. Wrote (or helped write) proposals for and won funds for using CBM on other projects, including:
  - ONR funds for Air traffic controller behavior
  - Air Force funds for JTF level C2
  - DMSO funds for Logistics Planning.
- Radar Signal Interpretation for Air Force, Rome Laboratories: Wrote proposal for and won Air force funds, invented, designed and implemented multiple-alleled genetic algorithm to solve radar signal interpretation problem.
- Pattern Learning for DARPA's EELD program. Invented genetic algorithm that operates directly on a graph, finding patterns in large semantic networks.
- Designed Soft Factors (Cultural and Behavioral factors) for Land Component of JWARS (JAS).
- Designed and Implemented Expert System for JWARS (JAS), using "expiration dates" for knowledge.
- Designed and Implemented C2 in coast guard Search and Rescue Simulation.
- All development in Smalltalk.

**Independent Contractor Analyst/Software Engineer,** Agent Based Learning Systems. Annandale, VA 6/97 – 6/98.

- Designed and implemented a simulation of self-organizing telecommunications networks that heal themselves upon a span cut within two seconds.

**Software Engineer,** Futron Corporation. Bethesda, MD 12/92 - 12/94.

- PPMI Project Management Intelligent Tutoring System: Invented, designed and implemented project management ITS. Agent "characters" each have own expert system in blackboard-based simulation. Personified knowledge of retiring NASA experts in a "mentor" character, before avatars became popular (C++).

**Research Assistant,** University of Alabama at Birmingham Computer Science Department, 9/89 – 6/91.

SDI target tracking program

- Invented, designed and implemented the main algorithm used, a neural network Kalman filter for target tracking ballistic missiles (C).

**Software Analyst**, Intergraph. Huntsville, AL 6/91 - 7/92.

- Designed and Implemented Compilers in C.

**Programmer**, UAB Vision Science Research Center. Birmingham, AL 6/88 - 9/89.

- Data Collection and Analysis Programs for Neuroscience in C and Fortran.

**Teaching Assistant**, North Carolina State University Computer Science Department, Raleigh 1/85-6/85.

### ***EDUCATION***

**Ph.D.** in Computational Sciences and Informatics 5/04. Major: Computational Social Science. George Mason University, Fairfax, Virginia. Dissertation Committee: Dr. John Grefenstette (Chair), Claudio Cioffi-Revilla, Kenneth De Jong, Harold Morowitz.

Artificial Intelligence and Social Science Coursework. Artificial Life centered course projects, including a simulation of a Biological Virus with non-coding segments and stop codons to solve computational problems, and a simulation of mimicry using coevolving genetic algorithms. Bioinformatics from Larry Hunter and John Grefenstette.

Dissertation title: SISTER: A Symbolic Interactionist Simulation of Trade and Emergent Roles

SISTER is a simulation in which several socio-economic phenomena emerge, including a role-based division of labor, price, money, and a sign system (tags). Agents in this simulation each have a genetic algorithm and coevolve (C++).

**Master of Science** in Computer and Information Science 6/91. The University of Alabama at Birmingham. GPA 3.9. Artificial Intelligence Coursework.

Thesis: A System of IAC Networks as the Basis for Self Organization in a Sociological Dynamical System Simulation

The earliest intelligent agent based computational social science simulation (1991), this thesis is the first use of tags as social markers (before Holland's Echo), and the first simulation to use reinforcement learning. In this simulation, employee and employer agents use their own neural network to induce the meanings of signs. Status symbols, social class, and prejudice emerge endogenously (C++).

It is the first symbolic interactionist simulation, a method where:

- Agents communicate solely through signs
- Agents induce the meanings of both displayed and read signs
- Inductions are based on economic and practical gain
- Symbol system and social institutions coevolve

**Bachelor of Science** in Sociology/Anthropology and Computer Science/Mathematics  
12/84, Virginia Commonwealth University, Richmond. Magna Cum Laude. Biology  
“Minor”. Winner ACM programming contest, third place mid-Atlantic team.

## PUBLICATIONS

### *Refereed Journals.*

- **Duong, Deborah Vakas** and John Grefenstette. “SISTER: A Symbolic Interactionist Simulation of Trade and Emergent Roles”. *Journal of Artificial Societies and Social Simulation*, January 2005. <http://jasss.soc.surrey.ac.uk/8/1/1.html>.
- **Vakas-Duong, Deborah**. “A Review of Read and Miller's Connectionist Models of Social Reasoning and Social Behavior”. *Journal of Artificial Societies and Social Simulation*, 1998,1,4. <http://jasss.soc.surrey.ac.uk/1/4/review2.html>.
- **Duong, Deborah Vakas** and Kevin D. Reilly. “A System of IAC Neural Networks as the Basis for Self-Organization in a Sociological Dynamical System Simulation”. *Behavioral Science*, 1995,40,4,275-303. <http://www.scs.gmu.edu/~dduong/behavioralScience.pdf>.

### *Book Chapters*

- **Duong, Deborah Vakas** and Jerry Pearman. “Data Processing for Mitigation: Data Interfaces for Input, Output, and Translation between Models” in *Sociocultural Behavior Sensemaking: State-of-the-Art in Understanding the Operational Environment*, Jill Egeth, Gary Klein, and Dylan Schmorrow, eds. McLean: Mitre Corporation, 2013. <http://www.scs.gmu.edu/~dduong/dataProcessingForMitigation.pdf>.
- **Duong, Deborah Vakas**. “Symbolic Interactionist Modeling: The Coevolution of Symbols and Institutions” (1996) *Computational Social Science*, Gilbert, ed. London: Sage Publications, 2010. <http://www.scs.gmu.edu/~dduong/symbolicInteractionistModeling.pdf>.
- **Duong, Deborah Vakas**, Robert Turner and Karl Selke. “Crime and Corruption,” *ESTIMATING IMPACT: A Handbook of Computational Methods and Models for Anticipating Economic, Social, Political and Security Effects in International Intervention*, Kott and Citrenbaum, eds. New York: Springer Verlag, 2010. [http://www.scs.gmu.edu/~dduong/Estimating\\_Impact\\_Corruption.pdf](http://www.scs.gmu.edu/~dduong/Estimating_Impact_Corruption.pdf)
- **Duong, Deborah Vakas**, “Autonomous Tags: Language as Generative of Culture” *Second World Conference on Social Simulation*, Takadama, Keiki; Revilla, Claudio Cioffi; Deffuant, Guillaume, eds. New York: Springer Verlag, 2010. <http://www.scs.gmu.edu/~dduong/WCSS08.pdf>
- **Duong, Deborah Vakas**, “The Generative Power of Signs: Tags for Cultural Reproduction” *Handbook of Research on Agent-Based Societies: Social and Cultural Interactions*, Goran Trajkovsky and Samuel Collins, eds., 2008. <http://www.scs.gmu.edu/~dduong/GenerativePowerOfSigns.pdf>

### *Refereed Conferences.*

- **Duong, Deborah.** “The Nexus Cognitive Agent Simulation: Using Computational Game Theory in Social Networks subject to Market Processes.” 82<sup>nd</sup> *MORS Symposium*, 2014. <http://www.scs.gmu.edu/~dduong/MORS82.pptx>
- **Duong, Deborah.** “The Data Absorption Technique: Coevolution to Automate the Accurate Representation Social Structure” *CSSSA Conference*, 2013. <http://www.scs.gmu.edu/~dduong/CSSSADataAbsorption.pdf>
- **Duong, Deborah, Jerry Pearman, and Christopher Bladon.** “The Nexus Cognitive Agent-Based Model: Coevolution For Valid Computational Social Modeling” *GECCO conference*, 2013. <http://www.scs.gmu.edu/~dduong/GECCONexus.pdf>
- **Duong, Deborah and Gerald Pearman.** “Adaptation to Data in the Nexus Network Learner Model of Corruption and Civil Military Operations.” 81<sup>st</sup> *MORS Symposium*, 2013. [http://www.scs.gmu.edu/~dduong/WG34\\_deborahDuong\\_WG-3281.pptx](http://www.scs.gmu.edu/~dduong/WG34_deborahDuong_WG-3281.pptx)
- **Duong, Deborah and Christopher Bladon.** “Interfacing and Validating Models of the US Army TRAC Tactical Wargame.” *AHFE Conference* 2012. <http://www.scs.gmu.edu/~dduong/AHFE12SIMmiddleware.pdf>  
<http://www.scs.gmu.edu/~dduong/ahfe12-IntegrationValidation.pptx>
- **Duong, Deborah and Gerald Pearman.** “Simulating Civilization Change with Nexus Cognitive Agents.” *AHFE Conference* 2012. <http://www.scs.gmu.edu/~dduong/AHFE12Nexus.pdf>  
<http://www.scs.gmu.edu/~dduong/ahfe12-CivilizationChange.pptx>
- **Duong, Deborah.** “Modeling the Effects of International Interventions with Nexus Network Learner.” *AAAI Spring Symposium*, 2012. <http://www.scs.gmu.edu/~dduong/Aaai12Nexus.pdf>  
<http://www.scs.gmu.edu/~dduong/aaai12-Aggregation.pptx>
- **Duong, Deborah.** “The Design of Computer Simulation Experiments of Complex Adaptive Social Systems for Risk Based Analysis of Intervention Strategies.” *AAAI Spring Symposium* 2012. <http://www.scs.gmu.edu/~dduong/Aaai12SIMmiddleware.pdf>
- **Duong, Deborah, Gerald Pearman, and Richard Brown.** “Irregular Warfare Analysis and Validation with the Social Impact Model.” 79<sup>th</sup> *MORS Symposium*, 2011. [http://www.scs.gmu.edu/~dduong/WG34\\_deborahDuong\\_WG-3281.pptx](http://www.scs.gmu.edu/~dduong/WG34_deborahDuong_WG-3281.pptx)
- **Duong, Deborah.** “Voting Processes in Complex Adaptive Systems to Combine Perspectives of Disparate Social Simulations into a Coherent Picture.” *AAAI Spring Symposium*, 2011. [http://www.scs.gmu.edu/~dduong/AAAI11Spring\\_DDuong.pdf](http://www.scs.gmu.edu/~dduong/AAAI11Spring_DDuong.pdf)
- **Duong, Deborah, Gerald Pearman, Richard Brown, David Makovoz, and Hyam Singer.** “The Social Impact Model: A Tool for Irregular Warfare Adjudication, Analysis, and Validation.” *HSCB Focus* 2011.
- **Duong, Deborah, David Makovoz and Hyam Singer** (Names listed in Alphabetical Order) “The Representation of Uncertainty for the Validation and



- Analysis of Social Simulations” Fall SISO Conference, 2010.  
<http://www.scs.gmu.edu/~dduong/SIWprobOnt.pdf>,  
<http://www.scs.gmu.edu/~dduong/SIWprobOnt.ppt>
- **Duong, Deborah;** David Makovoz and Hyam Singer. “Data Solutions for Irregular Warfare Simulations.” *78<sup>th</sup> MORS Symposium*, 2010.  
<http://www.scs.gmu.edu/~dduong/MORSDData.ppt>
  - **Duong, Deborah;** Ricky Brown, Johan Schubert, Mary McDonald, David Makovoz and Hyam Singer. “Strategic Data Farming of Military and Complex Adaptive Simulations for COA Optimization” *Scythe*, Issue 8 Workshop 20, Spring 2010 <http://www.scs.gmu.edu/~dduong/IDFW20Group17Report.pdf>,  
<http://www.scs.gmu.edu/~dduong/IDFW20Group17.ppt>
  - **Duong, Deborah.** “Verification, Validation, and Accreditation (VV&A) of Social Simulations” *Spring Simulation Interoperability Workshop*, Orlando, April 12-16 2010. **Winner of the SIWzie award (Recommended Reading)**  
<http://www.scs.gmu.edu/~dduong/SIWvalidation.pdf> ,  
<http://www.scs.gmu.edu/~dduong/SIW2010Validation.ppt>
  - **Duong, Deborah,** Nicholas Stone, Ben Goertzel, and Jim Venuto. “Indra: Emergent Ontologies from Text for Feeding Data to Simulations” *Spring Simulation Interoperability Workshop*, 2010  
<http://www.scs.gmu.edu/~dduong/SIWindra.pdf> ,  
<http://www.scs.gmu.edu/~dduong/SIW2010Indra.ppt>
  - **Duong, Deborah.** “Using Complex Adaptive Systems to Simulate Information Operations at the Department of Defense” *AAAI Fall Symposium*, 2009  
[http://www.scs.gmu.edu/~dduong/AAAI09\\_DDuong.pdf](http://www.scs.gmu.edu/~dduong/AAAI09_DDuong.pdf)
  - **Duong, Deborah.** “The Nexus Cognitive Agent Social Models” *Human Behavior Computational Modeling and Interoperability Conference*, , 2009  
<http://www.scs.gmu.edu/~dduong/HSCBNexus6-10-09.ppt>
  - **Duong, Deborah.** “Nexus Network Learner” MORS Workshop on Irregular Warfare Analysis II, 2009.
  - **Duong, Deborah.** “Agent Based Simulation” MORS Workshop on Irregular Warfare Analysis II, 2009.  
[http://www.mors.org/UserFiles/file/meetings/09iw/pres/WG3\\_Duong\\_D.pdf](http://www.mors.org/UserFiles/file/meetings/09iw/pres/WG3_Duong_D.pdf)
  - **Duong, Deborah.** “The Oz Wargame Integration Toolkit: Supporting Wargames for Analysis” MORS Workshop on Irregular Warfare Analysis II, 2009.  
[http://www.mors.org/UserFiles/file/meetings/09iw/pres/WG5\\_Duong\\_D.pdf](http://www.mors.org/UserFiles/file/meetings/09iw/pres/WG5_Duong_D.pdf)
  - **Duong, Deborah.** “Autonomous Tags: Language as Generative of Culture” *World Congress on Social Simulation*, 2008.
  - Marling, Robin; **Deborah Duong;** Bob Sheldon, Steve Stephens, Lauren Murphy, Jeffery Johnson, Michael Ottenberg “A Semantic Differential Approach to Incorporating Qualitative Data into Nexus, An Interpretive Agent Model of Support Between Social Groups” *World Congress on Social Simulation*, 2008.  
<http://www.scs.gmu.edu/~dduong/WCSSNexus.pdf>
  - **Duong, Deborah.** “Nexus: An Interpretive Social Simulation of Irregular Warfare and Corruption” *76<sup>th</sup> MORS Symposium*, 2008

- **Duong, Deborah,** Will Ellerby and Lauren Murphy. “The Oz Wargame Integration Toolkit: Supporting Wargames for Analysis” *76<sup>th</sup> MORS Symposium, 2008*
- **Duong, Deborah.** “Strategic Data Farming” *76<sup>th</sup> MORS Symposium, 2008*  
<http://www.scs.gmu.edu/~dduong/StrategicDataFarming.ppt> .
- **Duong, Deborah.** “Verification, Validation, and Accreditation of Agent-Based Simulations” *76<sup>th</sup> MORS Symposium, 2008*
- **Duong, Deborah,** R. Marling, L. Murphy, J. Johnson, M. Ottenberg, B. Sheldon and S. Stephens “Nexus: An Interpretive Social Simulation of Corruption,” *MORS Workshop on The Impact of Emerging Societies on National Security, Argonne, IL, April 2008.* .
- **Duong, Deborah.** “Adaptive Simulation: A Composable Agent Toolkit for War Game Adjudication” *Proceedings of the Agent 2007 Conference on Complex Interaction and Social Emergence,* North et al eds., Evanston IL, 2007.
- **Duong, Deborah,** R. Marling, L. Murphy, J. Johnson, M. Ottenberg, B. Sheldon and S. Stephens “Nexus: An Intelligent Agent Model of Support Between Social Groups” *Proceedings of the Agent 2007 Conference on Complex Interaction and Social Emergence,* North et al eds., Evanston IL, 2007.  
<http://www.scs.gmu.edu/~dduong/NexusAgent2007revised.pdf>
- **Duong, Deborah.** “Gaps, Tools, and Technologies for Analyzing Irregular Warfare,” *75<sup>th</sup> MORS Symposium, 2007*
- **Duong, Deborah.** “Language as Generative of Culture” *Interaction and Emergent Phenomena in Societies of Agents: Papers from the AAAI Fall Symposium,* AAAI Press Technical Report FS-06-05, 2006.
- **Duong, Deborah,** Ben Goertzel ,Jim Venuto, Ryan Richardson, Shawn Bohner, and Ed Fox. “Support Vector Machines to Weight Voters in a Voting System of Entity Extractors”. *Proceedings of International Joint Conference on Neural Networks,* Vancouver CA ,IJCNN July 2006.  
<http://www.scs.gmu.edu/~dduong/wcci.pdf>.
- **Duong, Deborah** and Mike Ross. Houses of Mirrors: Deeply Adaptive Designs for Machine Cognition. The First Artificial General Intelligence Workshop, 2006.  
<http://www.agiri.org/workshop/Duong.ppt>
- **Duong, Deborah Vakas** and John Grefenstette. “The Emulation of Social Institutions as a Method of Coevolution”. *GECCO conference,* 2005.  
<http://www.scs.gmu.edu/~dduong/gecco.pdf>.
- **Duong, Deborah Vakas** and John Grefenstette. “An Agent Based Simulation of Social Differentiation into Roles” *NAACSOS conference,* Carnegie Mellon University, June 2004.  
[http://www.casos.cs.cmu.edu/events/conferences/2004/2004\\_proceedings/Duong\\_Deborah.rev.doc](http://www.casos.cs.cmu.edu/events/conferences/2004/2004_proceedings/Duong_Deborah.rev.doc).
- **Duong, Deborah Vakas.** “Symbolic Interactionist Simulation” Inaugural Conference of Center For Social Complexity, George Mason University, May 2003.
- **Vakas, Deborah,** John Prince, H. Ric Blacksten, and Chuck Burdick. “Commander Behavior and Course of Action Selection in JWARS”. *Proceedings of the 2001 Winter Simulation Conference.*

- **Duong, Debbie Vakas**, Chuck Burdick, and LTC George Stone III. “Automated Land Command and Control in JWARS”. *69th MORS Symposium*, 2001.
- **Vakas, Debbie**, Chuck Burdick, Jerry Halbert, George Kuhn, Kay Burnett. “Behavioral Impacts on Battlefield Performance in JWARS”. *69th MORS Symposium*, 2001.
- **Vakas, Deborah**, John Prince, H. Ric Blacksten, and Chuck Burdick. “Commander Behavior and Course of Action Selection in JWARS”. *Tenth Conference on Computer Generated Forces and Behavioral Representation*, 2001. Selected as **“Recommended Reading”**. <http://www.scs.gmu.edu/~dduong/10th-CGF-041.pdf>.
- **Duong, Deborah Vakas**. “Symbolic Interactionist Modeling: Emerging Institutions from the Interpretation of Signs”. Abstract, American Association for the Advancement of Science Annual Meeting, Seattle, Washington, February 16, 1997.
- **Duong, Deborah Vakas**. “Symbolic Interactionist Modeling: The Coevolution of Symbols and Institutions”. *Intelligent Systems: A Semiotic Perspective Proceedings of the 1996 International Multidisciplinary Conference*, Vol 2, pp. 349 - 354. <http://www.scs.gmu.edu/~dduong/symbolicInteractionistModeling.pdf>.
- **Duong, Deborah Vakas** and Kevin D. Reilly. “Neural Network and Self Organizing System Simulation Through Container Classes in Object Oriented Programming”. *Proceedings of the Workshop on Neural Networks: Academic-Industrial-NASA-Defense, Selected Papers*, Society for Computer Simulation, 1992. <http://www.scs.gmu.edu/~dduong/simconf.html>
- Reilly, Kevin, Yochi Hayashi, **Deborah Duong**, and Penmatcha Krishnamraju. “Cooperative Schemes for Conventional and Neural Expert Systems”. Proc. IJCNN (International Joint Conference on Neural Networks). Vol II. A-888, 1991.

### *Reviewer for*

- Second World Congress on Social Simulation, 2008 (Board Member)
- Editorial Review Board of International Journal of Agent Technologies and Systems (IJATS)
- *Journal of Artificial Societies and Social Simulation (JASSS)*
- IEEE International Joint Conference on Neural Networks
- IEEE Transactions on Neural Networks
- Proceedings of the AGI Workshop 2006, Ben Goertzel, ed, Frontiers of Artificial Intelligence and Applications Series, IOS Press

### *Theses*

- **Duong, Deborah Vakas**. SISTER: A Symbolic Interactionist Simulation of Trade and Emergent Roles. Doctoral Dissertation, George Mason University, May 2004. <http://www.scs.gmu.edu/~dduong/dissertation.pdf>.
- **Duong, Deborah Vakas**. A System of IAC Neural Networks as the Basis for Self-Organization in a Sociological Dynamical System Simulation. Master’s

Thesis, The University of Alabama at Birmingham, June 1991.  
<http://www.scs.gmu.edu/~dduong/behavioralScience.pdf>.

### *Magazine Articles*

- SIMmiddleware appears in “Ontologies Support M&S and Analysis in the Irregular Warfare Domain,” *Phalanx*, June 2014, pp. 25 – 30.  
<http://www.scs.gmu.edu/~dduong/PhalanxOntologies.pdf>
- SISTER appears in “What Boys and Girls are Made Of,” *The Economist*, March 8, 1997, p. 96. <http://www.scs.gmu.edu/~dduong/economist.pdf>.
- **Duong, Deborah.** “Computational Modeling of Social Learning.” *Virtual School*, Brad Cox, ed., June 1995.  
<http://www.virtualschool.edu/mon/Bionomics/TraderNetworkPaper.html>.

### *INVITED SPEAKING ENGAGEMENTS AND POSITIONS*

- Chair of Military Operation Research Society (MORS) Social Science Working Group 2014, Technical Advisor to MORS Computational Social Science Working Group 2013 and 2012, Co-Chair 2011 and 2010.
- MORS Synthesis Committee Member , IW Workshop 2009, IO and Corruption Workshop 2010
- Eighth Annual MOVES Institute Open House, Naval Post-Graduate School., Symposium on Challenges to M&S if SSTR Operations . “Top Three Challenges to SSTR Operations” <http://www.scs.gmu.edu/~dduong/challenges.ppt>
- MORS Workshop on The Impact of Emerging Societies on National Security, Argonne, IL, April 2008. “Oz Wargame Integration Toolkit: A Way to Combine Models in a Wargame” <http://www.scs.gmu.edu/~dduong/MORSoverview.ppt>
- MORS Workshop on Improving Cooperation Among Nations in Irregular Warfare Analysis, Monterey CA, December 2007. “Gaps, Tools and Evaluation Methodologies for Analyzing the Global War on Terror.” <http://www.mors.org/UserFiles/file/meetings/07ic/Duong.pdf>
- Panel Member, Navy DIME-PMESSI Model Workshop, December 2007
- Marine Corps Agent Based Modeling VV&A Workshop, Fall 2007 “Simulating Irregular Warfare with Nexus”
- Panel Speaker, Marine Corps Agent Based Modeling VV&A Workshop, Spring 2007
- Genetic Algorithms Group, Spring 2002. “Two Symbolic Interactionist Simulations.”
- Washington Evolutionary Systems Society Luncheon, May 21, 1997. “Symbolic Interactionist Modeling: Emerging Institutions from the Interpretation of Signs.”
- Panel Speaker, **American Association for the Advancement of Science** Annual Meeting, February 16, 1997, Seattle, Washington. “Symbolic Interactionist Modeling: Emerging Institutions from the Interpretation of Signs.”

- Washington Evolutionary Systems Society Dinner Meeting, March 21, 1996. “Social Construction of Reality Modeling: The Coevolution of Symbols and Institutions.”
- Krasnow Institute Monthly Lecture Series, November 20, 1995. “Social Construction of Reality Modeling: A Trader Network Program Using the Principles of Interpretive Social Science.”