MODELING AND SIMULATION TERMINOLOGY

MILITARY SIMULATION
TECHNIQUES & TECHNOLOGY

Introduction to Simulation

- **Definitions.** Defines simulation, its applications, and the benefits derived from using the technology. Compares simulation to related activities in analysis and gaming.
- **DOD Overview.** Explains the simulation perspective and categorization of the US Department of Defense.
- **Training, Gaming, and Analysis.** Provides a general delineation between these three categories of simulation.

System Architectures

- **Components.** Describes the fundamental components that are found in most military simulations.
- **Designs.** Describes the basic differences between functional and object oriented designs for a simulation system.
- **Infrastructures.** Emphasizes the importance of providing an infrastructure to support all simulation models, tools, and functionality.
- **Frameworks.** Describes the newest implementation of an infrastructure in the forma of an object oriented framework from which simulation capability is inherited.

Interoperability

- **Dedicated.** Interoperability initially meant constructing a dedicated method for joining two simulations for a specific purpose.
- **DIS.** The virtual simulation community developed this method to allow vehicle simulators to interact in a small, consistent battlefield.
- **ALSP.** The constructive, staff training community developed this method to allow specific simulation systems to interact with each other in a single joint training exercise.

- **HLA.** This program was developed to replace and, to a degree, unify the virtual and constructive efforts at interoperability.

- **JSIMS.** Though not labeled as an interoperability effort, this program is pressing for a higher degree of interoperability than have been achieved through any of the previous programs.

Event Management

- **Queuing.** The primary method for executing simulations has been various forms of queues for ordering and releasing combat events.

- **Trees.** Basic queues are being supplanted by techniques such as Red-Black and Splay trees which allow the simulation store, process, and review events more efficiently than their predecessors.

- **Event Ownership.** Events can be owned and processed in different ways. Today's preference for object oriented representations leads to vehicle and unit ownership of events, rather than the previous techniques of managing them from a central executive.

Time Management

- **Universal.** Single processor simulations made use of a single clocking mechanism to control all events in a simulation. This was extended to the idea of a "master clock" during initial distributed simulations, but is being replaced with more advanced techniques in current distributed simulation.

- **Synchronization.** The "master clock" too often lead to poor performance and required a great deal of cross-simulation data exchange. Researchers in the Parallel Distributed Simulation community provided several techniques that are being used in today's training environment.

- **Conservative & Optimistic.** The most notable time management techniques are conservative synchronization developed by Chandy, Misra, and Bryant, and optimistic synchronization (or Time Warp) developed by David Jefferson.

- **Real-time.** In addition to being synchronized across a distributed computing environment, many of today's simulators must also perform as real-time systems. These operate under the additional duress of staying synchronized with the human or system clock perception of time.

Principles of Modeling

- **Science & Art.** Simulation is currently a combination of scientific method and artistic expression. Learning to do this activity requires both formal education and watching experienced practitioners approach a problem.

- **Process.** When a team of people undertake the development of a new simulation system they must follow a defined process. This is often re-invented for each project, but can better be derived from experience of others on previous projects.

- **Fundamentals.** Some basic principles have been learned and relearned by members of the simulation community. These have universal application within the field and allow new developers to benefit from the mistakes and experiences of their predecessors.

- **Formalism.** There has been some concentrated effort to define a formalism for simulation such that models and systems are provably correct. These also allow mathematical exploration of new ideas in simulation.

Physical Modeling

- **Object Interaction.** Military object modeling is be divided into two pieces, the physical and the behavioral. Object interactions, which are often viewed as 'physics based', characterize the physical models.

- **Movement.** Military objects are often very mobile and a great deal of effort can be given to the correct movement of ground, air, sea, and space vehicles across different forms of terrain or through various forms of ether.

- **Sensor Detection.** Military object are also very eager to interact with each other in both peaceful and violent ways. But, before they can do this they must be able to perceive each other through the use of human and mechanical sensors.

- **Engagement.** Encounters with objects of a different affiliation often require the application of combat engagement algorithms. There are a rich set of these available to the modeler, and new ones are continually being created.

- **Attrition.** Object and unit attrition may be synonymous with engagement in the real world, but when implemented in a computer environment they must be separated to allow fair combat exchanges. Distributed simulation systems are more closely replicating real world activities than did their older functional/sequential ancestors, but the distinction between engagement and attrition are still important.

- **Communication.** The modern battlefield is characterized as much by communication and information exchange as it is by movement and engagement. This dimension of the battlefield has been largely ignored in previous simulations, but is being addressed in the new systems under development today.

- **More.** Activities on the battlefield are extremely rich and varied. The models described in this section represent some of the most fundamental and important, but they are only a small fraction of the detail that can be included in a model.

Behavioral Modeling

- **Perception.** Military simulations have historically included very crude representations of human and group decision making. One of the first real needs for representing the human in the model was to create a unique perception of the battlefield for each group, unit, or individual.

- **Reaction.** Battlefield objects or units need to be able to react realistically to various combat environments. These allow the simulation to handle many situations without the explicit intervention of a human operator.

- **Planning.** Today we look for intelligent behavior from simulated objects. Once form of intelligence is found in allowing models to plan the details of a general operational combat order, or to formulate a method for extracting itself for a difficult situation.

- **Learning.** Early reactive and planning models did not include the capability to learn from experience. Algorithms can be built which allow units to become more effective as they become more experienced. They also learn the best methods for operating on a specific battlefield or under specific conditions.

- **Artificial Intelligence.** Behavioral modeling can benefit from the research and experience of the AI community. Techniques of value include: Intelligent Agents, Finite State Machines, Petri Nets, Expert and Knowledge-based Systems, Case Based Reasoning, Genetic Algorithms, Neural Networks, Constraint Satisfaction, Fuzzy Logic, and Adaptive Behavior. An introduction is given to each of these along with potential applications in the military environment.

Environmental Modeling

- **Terrain.** Military objects are heavily dependent upon the environment in which they operate. The representation of terrain has been of primary concern because of its importance and the difficulty of managing the amount of data required. Triangulated Irregular Networks (TINs) are one of the newer techniques for managing this problem.

- **Atmosphere.** The atmosphere plays an important role in modeling air, space, and electronic warfare. The effects of cloud cover, precipitation, daylight, ambient noise, electronic jamming, temperature, and wind can all have significant effects on battlefield activities.

- **Sea.** The surface of the ocean is nearly as important to naval operations as is terrain to army operations. Sub-surface and ocean floor representations are also essential for submarine warfare and the employment of SONAR for vehicle detection and engagement.

- **Standards.** Many representations of all of these environments have been developed. Unfortunately, not all of these have been compatible and significant effort is being given to a common standard for supporting all simulations. Synthetic Environment Data Representation and Interchange Specification (SEDRIS) is the most prominent of these standardization efforts.

Multi-Resolution Modeling

- **Aggregation.** Military commanders have always dealt with the battlefield in an aggregate form. This has carried forward into simulations which operate at this same level, omitting many of the details of specific battlefield objects and events.

- **Disaggregation.** Recent efforts to join constructive and virtual simulations have required the implementation of techniques for cross the boundary between these two levels of representation. Disaggregation attempts to generate an entity level representation from the aggregate level by adding information. Conversely, aggregation attempts to create the constructive from the virtual by removing information.

- **Interoperability.** It is commonly accepted that interoperability in these situations is best achieved though disaggregation to the lowest level of representation of the models involved. In any form the patchwork battlefield seldom supports the same level of interoperability across model levels as is found within models at the same level of resolution.

- **Inevitability.** Models are abstractions of the real world generated to address a specific problem. Since all problems are not defined at the same level of physical representation, the models built to address them will be at different levels. The modeling an simulation problem domain is too rich to ever expect all models to operate at the same level. Multi-Resolution Modeling and techniques to provide interoperability among them are inevitable.

Verification, Validation, and Accreditation

- **Verification.** Simulation systems and the models within them are conceptual representations of the real world. By their very nature these models are partially accurate and partially inaccurate. Therefore, it is essential that we be able to verify that the model constructed accurately represents the important parts of the real world we are try to study or emulate.

- **Validation.** The conceptual model of the real world is converted into a software program. This conversion has the potential to introduce errors or inaccurately represent the conceptual model. Validation ensures that the software program accurately reflects the conceptual model.

- **Accreditation.** Since all models only partially represent the real world, they all have limited application for training and analysis. Accreditation defines the domains and conditions under which a particular model can be reliably used.
- **VV&A Principles.** The Department of Defense has established specific guidelines for conducting VV&A. Simulation researchers have also defined fundamental principles that are important for this activity.

Model Building Exercises

- **Modeling.** In-class projects to explore the concepts presented in the lectures. These exercises demonstrate the process and product of modeling the real world.
- **Exploration.** Students explore the questions involved in modeling. Learn to identify the objective of the system, interactions in the virtual world, objects that must be defined, and dynamic and static attributes of the objects.
- **Models and Infrastructure.** Practical exercises demonstrate the power of a simulation infrastructure and how it is related to the models of the real world.

ACRONYMS

ADS	Advanced Distributed Simulation
AMG	Architecture Management Group
AMSO	Army Modeling and Simulation Office
API	Application Programmer Interface
ASOC	Air Sovereignty Operations Center
BBS	Brigade/Battalion Battle Simulation
C3	Command, Control and Communications
CAX	Computer Assisted (Aided) Exercise
CBS	Corps Battle Simulation
CCTT	Close Combat Tactical Trainer
CGF	Computer Generated Forces
CGI	Computer Graphic Interface / Common Gateway Interface
CONOPS	Concept of Operations
CORBA	Common Object Request Broker Architecture
COTS	Commercial off-the-shelf
CSSTSS	Combat Service Support Training Simulation System
CTDB	Compact Terrain Database Base
DARPA	Defense Advanced Research Projects Agency
DBMS	Data-Base Management System
DCOM	Distributed COM (Component Object Model)
DCS	Data Coding Standard
DIS	Distributed Interactive Simulation
DMSO	Defense Modeling and Simulation Office
DoD	Department of Defense
DOM	Document Object Model
DRM	Data Representation Model
EXCIMS	Executive Council for Modeling and Simulation
FEDEP	Federation Development and Execution Process
FIFO	First In First Out

FOM	Federation Object Model
FZD	Fire Zone Defense
GIAC	Graphics Input Aggregate Control
GVT	Global Virtual Time
HLA	High-Level Architecture
HOP	Hasty Occupy Position (algorithm)
HTTP	Hyper-Text Transfer Protocol
IDL	Interface Definition Language
IIOP	Inter-ORB Communication Protocol
IMACCS	Integrated Monitoring, Analysis and Control COTS System
IMT	Information Management Terminal
JDBC	Java Database Connectivity
JSIMS	Joint Simulation System
JTC	Joint Training Confederation
JTLS	Joint Theater Level Simulation
JWORB	Java Web Object Request Broker
LAN	Local Area Network
LOC	Line-Of-Code
M&S	Modeling and Simulation
MILES	Multiple Integrated Laser Engagement System
MoD	Ministry of Defense
ModSAF	Modular Semi-Automated Forces
MODSIM	Modular Simulation Language
MOSAIC	MOdels & Simulations: Army Integrated Catalog
MPP	Message Processor Program
MRM	Multi-Resolution Model
MSIAC	Modeling and Simulation Information Analysis Center
MSRR	(Army) Modeling and Simulation Resource Repository
MTWS	Marine Air Ground Task Force Tactical Warfare Simulation
NC3A	NATO's Command Control and Consultancy Agency
NMCC	National Military Command Center
NPAC	Northeast Parallel Architectures Center (Syracuse University)
NTC	(Army) National Training Center

ODBC	Open Database Connectivity
OLEDB	Object Linking and Embedding – Data Base
OMDT	Object Model Development Tool
OMG/DARPA	Object Management Group/ Defense Advanced Research Project Agency
OPLAN	Operations Plan
PIMS	Partnership Information Management System
PSS	Persistent State Service
RDBMS	Relational Data-Base Management System
RDF	Resource Description Format
RENAISSANCE	Reusable Network Architecture Interoperable Space Science, Analysis, Navigation, and Control Environment
RESA	Research, Evaluation, and Systems Analysis
RMI	Remote Method Invocation
SAM	Surface-to-Air Missile
SAMPEX	Solar Anomalous Magnetospheric Particle Explorer
SMTP	Simple Message Transfer Protocol
SQL	Structured Query Language
SSN	Space Surveillance Network
STF	SEDRIS Transmittal Format
TACSIM	Tactical Simulation
TIN	Triangulated Irregular Networks
TRP	Target Reference Point
TVR	Televirtual
UML	Unified Modeling Language
VICTORS	Variable Intensity Computerized Training System
VRML	Virtual Reality Modeling Language
VV&A	Verification, Validation and Accreditation
WAN	Wide Area Network
XML	Extensible Markup Language

MODELING AND SIMULATION
RELATED WEB SITES

Defense Modeling, Simulation & Tactical Technology Information Analysis Center (DMSTTIAC)

ADS	`ads.msrr.dmso.mil`	Authoritative Data Sources [DMSO]
AEDC	`www.arnold.af.mil`	Arnold Engineering Development Center [AF]
AFAMS	`www.afams.af.mil`	Air Force Agency for Modeling & Simulation
AFCA	`www.afca.scott.af.mil`	Air Force Communications Agency
AFIT	`www.afit.af.mil`	Air Force Institute of Technology
AFSAA	`www.afsaa.hq.af.mil`	Air Force Studies Analyses Agency
AIR FORCE	`www.af.mil`	Air Force Home Page
Air Force MSRR	`Afmsrr.afams.af.mil.`	Air Force M&S Resource Repository
ALSP	`stricom.army.mil/hla/amg/PRODUCTS/ALSP`	Aggregate Level Simulation Protocol
AMG	`hla.dmso.mil/hla/amg`	Architecture Management Group [DMSO – HLA]
APG	`www.apg.army.mil`	Aberdeen Proving Ground [ARMY]
ARDEC	`www.pica.army.mil`	Armament R,D, &E Center [ARMY]
ARDEC – DIS	`Dis.pica.army.mil`	Armament R,D, &E Center - DIS [ARMY]
ARL	`www.arl.mil/`	Army Research Laboratory
ARMY	`www.army.mil`	Army Homepage
ARMY MSRR	`www.msrr.army.mil`	Army M&S Resource Repository

ASA, RDA (ASA, AL&T)	`www.sarda.army.mil`	Asst Secretary of the Army for Research, Development, &Acquisition [effective 16 Feb99 ASA, AL&T]
ASNE MSEA	`Msea.afccc.af.mil`	Air & Space Natural Environment MSEA
ASTT	`www.astt.com`	Advanced Simulation Technology Thrust [DARPA/JSIMS]
ATDNet	`www.atd.net`	Advanced Technology Demonstration Network
AWSIM	`www.wg.hanscom.af.mil/AWSIMR/`	Air Warfare Simulation [AF]
BMD SSC	`www.jntf.osd.mil/bmdssc/`	Ballistic Missile Defense Simulation Support Center
BMDO	`www.jntf.osd.mil/`	Ballistic Missile Defense Organization
BMDOLINK	`www.acq.osd.mil/bmdo/bmdolink/html`	BMDOLink
BMDO MSRR	`www.jntf.osd.mil/bmdssc/`	BMDO M&S Resource Repository
C4ISR DSC	`www.dsc.osd.mil`	[Joint] C4ISR Decision Support Center
C4ISR JBC	`www.jbc.js.mil`	C4ISR Joint Battle Center
C4ISR Model	`www.diisa.mil/D8/html/c4isr.html`	DISA C4ISR Model [Federation]
CFS	`www.itsi.disa.mil/`	Center For Standards [DISA JIEO]
CMMS	`www.dmso.mil/projects/cmms/`	Conceptual Model of the Mission Space [DSMO]
COMPASS	`Compass.saic.com`	Common Operation Modeling, Planning, &Simulation Strategy
DARPA	`www.darpa.mil`	Defense Advanced Research Projects Agency
DDR&E	`www.dtic.mil/ddre`	Director Defense Research & Engineering [OSD]
DEEM	`www.dis.anl.gov/DEEM`	Dynamic Environmental Effects Model
DEFENSLINK	`www.defenselink.mil`	DefenseLINK
DIAS	`www.dis.anl.gov/DIAS`	Dynamic Information Architecture System

DISA	`www.disa.mil`	DEFENSE information Systems Agency
DISA C4ISR Model	`www.disa.mil/D8/html/c4isr.html`	DISA C4ISR Model [Federation]
DISA Standards	`www.itsi.disa.mil/links.html` `www.disa.mil`	DISA Standards Links DISA Standards Site Index
DMSO	`www.dsmo.mil`	Defense Modeling and Simulation Office

DMSO Projects>		
>M&S Awards	`www.dmso.mil/dmso/projects/award`	DMSO M&S Award Program
>ADS	`Ads.msrr.dmso.mil`	Authorities Data Sources
>CMMS	`www.dmso.mil/dmso/projects/cmms`	Conceptual Model of the Mission Space
>DAVIE	`www.dmso.mil/projacts/davie`	Data Verification Interactive Editor
>DS	`www.dmso.mil/ds`	Data Standardization
>DMSTTIAC	`Dmsttiac.iitri.org`	Defense Modeling, Simulation, & Tactical Technology Information Analysis Center
>HLA	`Hla.dmso.mil/hla`	High – Level [Simulation] Architecture
>HBR	`www.dmso.mil/dmso/projects/hbr``	Human Behavior Representation
>MEL	`Mel.dmso.mil`	Master Environment Library
>MSOSA	`www.msosa.mil.inter.net`	Modeling & Simulation Operational Support Activity
>MSRR	`www.msrr.dmso.mil`	Modeling &Simulation Resource Repository
>SEDRIS	`www.sedris.org`	Synthetic Environment Data Representation & Interchange Specification
>UOB	`www.dmso.mil/dmso/projects/uob`	Unit Order of Battle
>TMPO	`www.tmpo.nima.mil`	Terrain Modeling Project Office
>VV&A	`www.dmso.mil/dmso/projects/vva`	Verification, Validation, and Accreditation

DMSTTIAC	`Dmsttiac.iitri.org`	Defense Modeling, Simulation, & Tactical Technology Information Analysis Center [DMSO/DISA/DTIC]
DREN	`www.arl.mil/HPCMP/DREN`	Defense Research & Engineering Network
DS	`www.dmso.mil/projects/ds`	Data Standardization [DMSO]
DSC	`www.dsc.osd.mil`	[Joint C4ISR] Decision Support Center
DTIC	`www.dtic.mil`	Defense Technical Information Center
E2DIS	`Vader.nrl.navy.mil/e2dis_www/home.html`	Environment Effects for Distributed Interactive Simulation
EADSIM	`www.smdc.army/mil/eadsim.html`	Extended Air Defense Simulation
EADTB	`www.smdc.army.mil/eadtb~2.html`	Extended Air Defense Test bed
EXCIM	`www.dmso.mil/dmso/wrkgrps/excims`	Execute Council on Modeling &Simulation [DMSO]
HBR	`www.dmso.mil/dmso/projects/hbr``	Human Behavior Representation [DMSO]
HLA	`Hla.dmso.mil/hla`	High – Level Architecture [DMSO}
HPCMP	`www.hpcm.dren.net`	High Performance Computing Modernization Program
ISOC	`www.isoc.org`	Internet Society
IST	`www.ist.ucf.edu`	Institute for Simulation & Training, Univ of Central Florida
ISTI	`Disa11.disa.atd.net`	Information Systems Technology Insertion [DSA]
ITEA	`www.itea.org`	International Test &Evaluation Association
JADS JTF	`www.jads.abq.com`	Joint Advanced Distributed Simulation Joint Test Force
JASA	`www.nawcwpns.navy.mil/~jasa`	Joint Accreditation Support Activity

JBC	`www.jbc.js.mil`	Joint [C4ISR] Battle Center
JSC	`www.dtic.mil/jsc`	Joint Chief of Staff
JDBE	`208.245.129.4`	Joint Data Base Element
JEL	`www.dtic.mil/doctrine/jel/index.html`	Joint Electronic Library
JMASS	`www.jmas.wpafb.af.mil`	Joint Modeling and Simulation System
JSF	`www.jast.mil/html/jst_homepage.htm`	Joint Strike Fighter
JSIMS	`www.jsims.mil`	Joint Simulation System
JTA	`http://www.acq-ref.navy.mil/narsoc/jta021`	Joint Technical Architecture [DoD]
JTASC	`www.jtasc.acom.mil`	Joint Training, Analysis, and Simulation Center [USACOM]
JWARS	`www.dtic.mil/jwars`	Joint Warfare System
JWFC	`www.jwfc.acom.mil`	Joint War fighting Center [USACOM]
MARINES	`www.usmc.mil`	Marine Corps Homepage

M&S Master Plans>		
>DoD	`www.dmso.mil/dmso/docslib/mspolicy/msmp`	
>Army	`www.amso.army.mil/mstrplin`	
>Navy	`www.nawcad.navy.mil/tems/references/html`	
>Air Force	`www.afams.af.mil/webdocs/afmsmp/`	
>Marine Corps	`www.dmso.mil/dmso/docslib/mspolicy/usmcplan/`	
>NATO	`www.dmso.mil/dmso/dicslib/mspolicy/nato_msmp/`	

M&S Management Office>		
>DMSO	`www.dsmo.mil`	Defense Modeling and Simulation Office
>AMSO	`www.amso.army.mil/`	Army Model and Simulation Office
>NAVMSMO	`Navmso.hq.navy.mil`	Navy Modeling and Simulation Management Office
>XOC	`204.34.204.77/`	AF Directorate of Command &Control [has M&S mgmt]
>> AFMS	`www.afams.af.mil`	Air Force Agency for Modeling and Simulation

MEL	`Mel.dmso.mil`	Master Environment Library [DMSO]
MORS	`www.mors.org`	Military Operations Research Society
MOVES	`www.moves.nps.navy.mil`	Modeling, Virtual Environment, and Simulation
MSOSA	`www.msosa.mil.inter.net`	Modeling & Simulation Operational Support Activity [DMSO]

MSRR>	`www.msrr.dmso.mil`	Modeling and Resource Repository [DMSO]
>Air Force MSRR	`www.afsaa.hq.af.mil/index.html`	Air Force Studies &Analyses Agency
>Army MSRR	`www.msrr.army.mil`	Army M&S Resource Repository
>Navy MSRR	`Navmsmo.hq.navy.mil/nmsiscat/`	Navy M&S Information System (NMSYS) Catalog
>BMDO MSRR	`www.jntf.osd.mil/bmdssc/`	BMDO M&D Resource Repository
>MEL	`Mel.dmso.mil`	Master Environmental Library [DMSO]
>ADS	`www.ads.msrr.dmso.mil`	Authoritative Data Sources [DMSO}
>C4ISR DSC	`www.dsc.osd.mil/`	C4ISR Decision Support Center [Joint]
>DIA	`On SIPRNET`	Defense Intelligent Agency

MSOC	`www.dmso.mil/SOC`	DoD M&S Staff Officer Course
MSTP	`www.mstp.quantico.usmc.mil/`	MAGTF Staff Training Program Center
MSTTF	`www.dmso.mil/dmso/wrkgrps/tf/msttf.html`	M&S Terminology Task Force [Glossary]
MSWG	`www.dmso.mil/dmso/wrkgrps/mswg/`	M&S Working Group [DMSO]
NASA	`www.nasa.gov`	National Aeronautics & Space Administration
NASA SW IV&V	`www.ivv.nasa.gov`	NASA Software Independent Verification & Validation Facility
NASM	`www.nasm.hanscom.af.mil/NASM`	National Air &Space (Warfare) Model [AF]

NAVSMO	Navsmo.hq.navy.mil	Navy Modeling & Simulation Management Office
NAVY	www.navy.mil	Navy Homepage
Navy MSRR	navmsmo.hq.navy.mil/nmsiscat/	Navy M&S Information System (NMSIS) catalog
NAVY TEMS	www.nawcad.navy.mil/tems	Navy Test & Evaluation Modeling & Simulation
NAWCTSD	www.ntsc.navy.mil	Naval Air Warfare Center, Training System dev9ision
NIMA	www.nima.mil	National Imagery and Mapping Agency
NIST	www.nist.gov	National Institute of Standards and Technology
NPSNET	www.npsnet.nps.navy.mil	Naval Postgraduate School NPSNET Research Group
NRL	www.nrl.navy.mil	Naval research laboratory
NSC	www-leav.army.mil/index.htm	National Simulation Center

NTERMS	Nterms.mugu.navy.mil	Navy Test &Evaluation Repository for Models & Simulation
ODCI	www.odci.gov/ic/icagen2.html	US Intelligence Community Links [ODCI]
OEA	Rsd-www.nrl.navy.mil/OceanEA/	Ocean Executive Agent for M&S
OSI	Osi.usmc.mil	Office of Science and Innovation [Marine Corps]
SBA SIA	http://www.msosa.dmso.mil/sba	Simulation Base Acquisition – Special Interest Area
SCS	www.scs.org	Society for Computer Simulation
SEDRIS	www.sedris.org	Synthetic Environment Data Representation & Interchange Specification

SIA's>	www.msosa.dmso.mil/msosa-net/sia.asp	Special Interest Area [MSOSA/DMSO]

>HOBM	`www.msosa.dmso.mil/hobm/`	Human &Organization Behavior Modeling SIA
>IA	`www.msosa.dmso.mil/ia`	Impact Assessment SIA
>MSMP	`www.msosa.dmso.mil/msmp`	DoD M&S Master Plan Revision SIA
>MSRR	`www.msosa.dmso.mil/msrr`	MSRR Board of Directors &User's Conference SIA
>OOTW	`www.msosa.dmso.mil/ootw/`	Operations Other Than War SIA
>SBA	`www.msosa.dmso.mil/sba`	Simulation Based Acquisition SIA

SISO	`Siso.sc.ucf.edu`	Simulation Interoperability Standards Organization
SMART	`Sba.iitri.org`	Simulation & Modeling for Acquisition, Requirement and Training [Army SBA]
SMC/XR	`www.afbmd.laafb.af.mil/org/xrm`	SMC M&S Home Page [AF]
SPAWAR	`C4iweb.spawar.navy.mil/pd13/pmw131/`	Warfare Analysis, M&S Program [Navy]
SSBLaRC	`Ssb-www.larc.nasa.gov/fltsim/index.html`	Simulation System Branch – Langley Research Center
STEP	`www.acq.osd.mil/te/programs/tfr/step.htm`	Simulation, Test &Evaluation Process Guidelines [OSD]
STOW	`Stow98.spawar.navy.mil`	Synthetic Theater of War – 98
STRICOM	`www.stricom.army.mil`	Simulation, Training, Instrumentation Command [ARMY]
TAFIM	`www-library.itsi.disa.mil/tafim.html`	Technical Architecture Framework for information Management [DISA]
TARDEC	`www.tacom.army.mil/tardec/`	Tank – Automotive research Development & Engineering Center [ARMY]
TEMS	`www.nawcad.navy.mil/tems`	Navy Test &Evaluation Modeling & Simulation

THUNDER	`www.s#i.com/Default.htm`	Homepage for THUNDER, theater – level campaign simulation [AF]
TMPO	`www.tmpo.nima.mil`	Terrain Modeling Project Office
TRAC	`www.trac.army.mil`	TRADOC Analysis Command
UK SWING	`Siwg.dra.hmg.db/`	UK Simulation Interoperability Working Group
USASMDOC	`www.smdc.army.mil`	U.S. Army Space & Missile Defense
USASMDC SMULATION CENTER	`Sc -www.army.mil`	Command U.S. Army Space &Missile Defense Command Simulation Center
USMC	`www.usmc.mil`	US Marine Corps Homepage
VPG	`Vpg.tecom.army.mil`	Virtual Proving Ground [ARMY]
VV & A	`www.dmso.mil/dmso/projects/vva/`	Verification, Validation, & Accreditation
WARSIM	`www.stricom.army.mil/stricom/pm-warsim/`	PM-Warfighters' Simulation [Army]
XOC	`204.34.204.77/`	AF Directorate of Command &Control [M&S [mgmt]