

28th Annual
Flight and Ground Vehicle Simulation Course
January 23 - 27, 2012

Presented by
Binghamton University,
Thomas J. Watson School of
Engineering and Applied Science

BINGHAMTON
UNIVERSITY
STATE UNIVERSITY OF NEW YORK

In cooperation with
American Institute of Aeronautics
& Astronautics (AIAA)
Modeling and Simulation
Technical Committee

Specialized Short Courses on January 30 - 31, 2012
Visual System Specifications and Acceptance Tests
Visual Database Design



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COURSE DESCRIPTION

The Flight and Ground Vehicle Simulation Update is a unique five-day program cosponsored by the State University of New York at Binghamton and the American Institute of Aeronautics and Astronautics (AIAA) Modeling and Simulation Technical Committee. Their cooperative efforts have produced a program that addresses all major components and subsystems comprising today's complex flight and ground vehicle simulators.

WHO SHOULD ATTEND

Engineers, system hardware and software design specialists, managers, and simulation support personnel, including product sales/marketing representatives, and other professionals associated with the specification, design, testing, implementation, or acquisition of modern flight and ground vehicle simulators.

OBJECTIVES

The course provides a comprehensive overview for professionals seeking a working understanding of the key components of flight and ground vehicle simulation. It serves as a major forum for practicing simulation engineers seeking a state-of-the-art update in system design, applications, and research trends.

FLIGHT AND GROUND VEHICLE SIMULATION COURSE (January 23-27, 2012)

Professor Frank Cardullo, Binghamton University

Simulation Fundamentals

- Intro to Human in the Loop Simulation
- Architecture of a Simulator
- Applications of Simulators
- A Control Theoretic Approach to Human in the Loop Simulation

Motion and Force Cueing

- Operator Performance and Behavior as a Basis for Motion Cueing
- Perceptual Aspects
- Platform Motion Systems
- In-cab Motion and Force Cueing Devices
- High-G Cue Augmentation

Simulator Systems Integration

- The Need for Cue Integration and Synchronization
- Simulator Cue Integration
- Simulator Cue Synchronization
- Simulator Sickness

Dr. Valerie Gawron, MITRE Corp.

Simulation Applications in Training

- Role of Simulation in a Training Curriculum
- Curriculum Evaluation
- Transfer of Training
- Traditional Types of Simulators for Training
- Nontraditional Types of Simulators for Training

James R. Takats, OPINICUS Corp.

Flight Control System Simulation

- Conventional Flight Control Systems Autopilot, Automatic Flight Control System and Stability Augmentation System
- Ground Vehicle Control Systems
- Control Loading Force Servos
- Digital Control Loading Systems
- Set-up of Control Loading Systems
- Performance Verification

R. Thomas Galloway, Consultant & David Gingras, Bihrl Applied Research

Mathematical Modeling of Vehicle Dynamics

- Vehicle Dynamics Models
- Simulator Data Issues
- Flight Data
- Modeling Tools
- Case Studies: Flight Simulation - What, Why, and How

Simulation Validation and Evaluation of Flight Simulators

- Validation Data Requirements
- Test Methodologies
- Flight Test Correlation Methodologies
- Pilot Tailoring
- Case Studies

Timothy Keeter, Dynetics, Inc.

Threat Missile Modeling

- Basic Missile Functionality
- Modeling Issues Associated with:
 - Aerodynamics
 - Guidance and Control
 - Onboard Sensors
 - Reference Frames
 - Subsystem Integration
 - Testing Methodologies
- What the Analyst Needs from Your Simulation
- Balancing Real-Time with Performance Accuracy

Paul A. Ray, Parmel, Ltd.

Flight Simulator Qualification

- Fundamental Considerations
- Device Descriptions
- Simulator Qualification Standards
- Military Use of Civilian Standards
- Why Qualification?
- Evaluation Process
- Application of Standards
- Evaluation and Qualification

Dr. Katherine L. Morse, Johns Hopkins University, Applied Physics Laboratory

Distributed Simulation/High Level Architecture Overview

- History of Distributed Simulation Architectures
- High Level Architecture (HLA)
- Federation Engineering and System of Systems (SoS) Modeling

Dr. James L. Davis, Consultant

Visual Perception and Display

- The Human Visual System
- Visual Perception
- Visual System Characteristics and Limits

Visual Display Systems

- Factors Affecting Choice of a Display
- System for Simulation
- Measurement of Display System Parameters
- Current Display Technologies

Roy W. Latham, CGS Development Corp.

PC Image Generators

- Key Specifications
- Current Products
- Innovations
- Trends and Predictions

Real Time Computing

- Requirements and Approaches
- Computer Systems Organization
- Real Time Computing on PCs

Olen Atkins, Wegmann USA

Computer Image Generation

- History and applications
- Image Generators
- Databases
- System interactions

VISUAL SYSTEM SPECIFICATION AND ACCEPTANCE TESTS COURSE (January 30 - 31, 2012)

Roy W. Latham, CGS Development Corp.

Overview of Specification Process and Database, Real Time Software, Image Generator & Display Specifications. Task Analysis, Image Generator HW Features, Capacity, Features, Common Parameters, Projection & HMD Display, Color Specification & Measurement, Acceptance Test Principles/Special Problems, Project Management, Future Trends

VISUAL DATABASE DESIGN COURSE (January 30 - 31, 2012)

Olen Atkins, Wegmann USA

Introduction to Visual Databases, "Real-time" Simulation, The Database As a Component of the Visual System and of the Simulation, Database Design, Structure and Development Tools, Database Components, Source Data, Optimization Tricks & Shortcuts, Project Management, Future Trends

REGISTRATION

Advance registration is mandatory as enrollments may be limited to ensure instructional quality.

Best Method:

www.flightsim.binghamton.edu

Questions: Call our office 607-777-2154 or e-mail laltman@binghamton.edu

FEEES

	5-day Course	5-day Course plus 2-day Short Course	2-day Short Course ONLY
University or Government	\$1,695	\$2,270	\$695
Industry Employee	\$1,795	\$2,370	\$745

Registration fees include course CD, parking, morning and afternoon refreshments, lunches, and a reception.

Check our web site for additional information including detailed information about instructors, courses, directions, schedule, lodging, area restaurants and places of interest.

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