UMIACS

University of Maryland Institute for Advanced Computer Studies

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Mission

Promote excellence in basic and applied research in computing and interdisciplinary research in computer-related studies

Serve as a catalyst for new research programs addressing fundamental issues at the interface between computer science and other disciplines
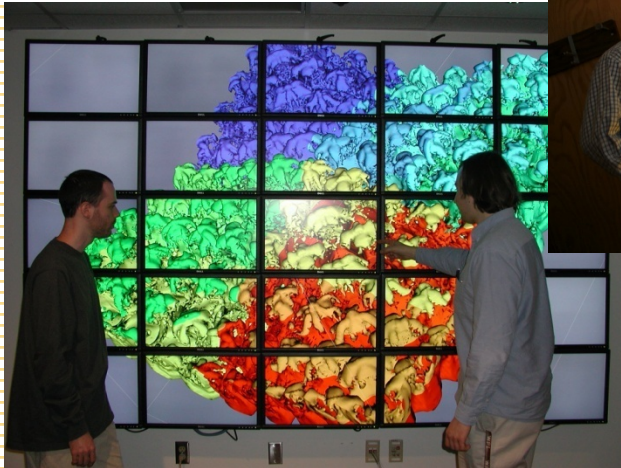
Broad Application Themes

Focus on High-Impact, Grand Challenge Applications where Computing can play a transformative role

- Sensing and Interaction

- Biology and the Environment

- Language and Media

- Society and Culture

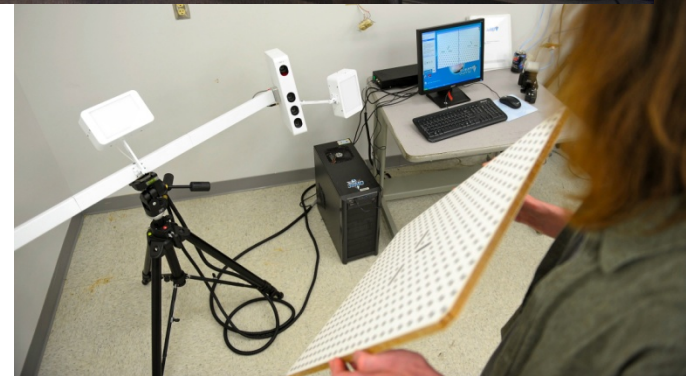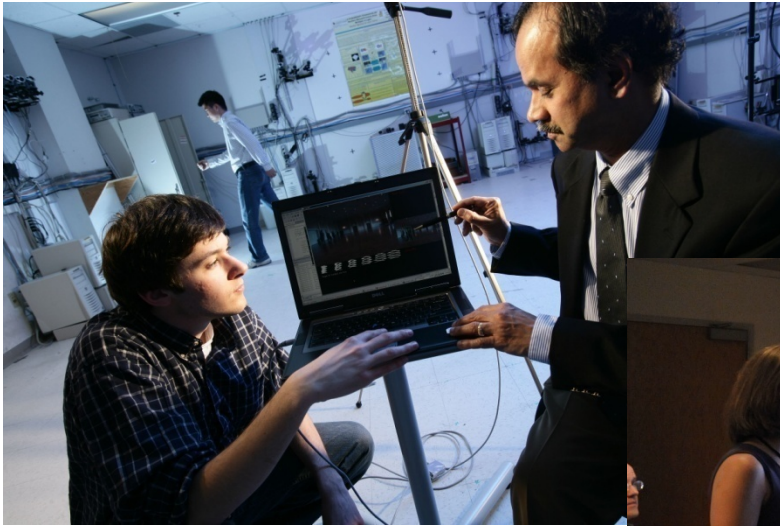- Modeling and Simulation

- Security and Privacy

Computing Themes

- High Performance and Parallel Computing

- Artificial Intelligence

- Computer Systems and Networks

- Visualization and Interaction

- Scientific Computing

- Software Engineering

- Security

- Databases

- Algorithms

UMIACS Labs

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UMIACS Interactions on Campus

College of Computer, Mathematical, and Natural Scienes
> Computer Science
> Biology
> Cell Biology and Molecular Genetics
> Chemistry and Biochemistry
> Mathematics

Clark School of Engineering
> Aerospace Engineering
> Electrical Engineering
> Mechanical Engineering

College of Arts and Humanities
> Linguistics

College of Behavioral and Social Sciences
> Geography

College of Library and Information Sciences (iSchool)

Smith School of Business

Sensing and Interaction

- How will we interact with the technology of the future?

- How can we transform immense images, audio, video, and geographic information systems into situational awareness?

- How can we identify people from their faces, gait, and interaction patterns with computers?

- How do robots interact with their environment?

- How can visual computing help in assembling nano-machines?

Center for Automation Research, Human-Computer Interaction Lab, Computer Vision Laboratory, Graphics and Visual Informatics Lab, Perceptual Interfaces and Reality Laboratory

Biology and Health Care

- Designing algorithms for sequencing genomes from collections of microbial communities

- Building reasoning environments for Electronic Health Records

- Exploring spatio-temporal patterns of brain imaging for better insights into Autism, Schizophrenia, Parkinson's, and Traumatic Brain Injury

Center for Bioinformatics and Computational Biology, Center for Health-related Informatics and Bioimaging

Language and Media

- Novel tools and methodologies for natural language processing

- Algorithms for computational linguistics, handwriting and optical character recognition

- Summarization of vast amounts of written and video data

- Sentiment analysis in texts, blogs, news streams, and social media networks

Computational Linguistics and Information Processing Lab, Language and Media Processing Lab

Society, Culture, and Communication

- Are there systematic computational models for predicting the actions of terrorist groups?

- How does influence propagate in social networks and cultures?

- How can context-aware computing transform next-generation broadband mobile communication applications?

Center for Digital International Government,
Lab for Computational and Cultural Dynamics,
Maryland Information Network Dynamics Lab

Security and Privacy

- Research into cryptography, software security, cloud security and privacy

- Security and information assurance; DDOS attacks; wireless sensor networks

- Criminological behaviors, sociological, threat & malware quantification

- Supply chain security, cybersecurity policy and legislation

Maryland Cybersecurity Center

Modeling and Simulation

- Development of petascale tools and algorithms applicable to fluid-structure interactions in viscous incompressible flows for design of artificial heart valves

- High-performance modeling for hypersonic flight

- Massively parallel deep learning for object recognition, image understanding, natural language processing

Laboratory for Parallel and Distributed Computing
NVIDIA CUDA Center of Excellence
Cluster for Research on Complex Computations Lab

Synergistic Off-Campus Interactions

- **Laboratory for Telecommunication Sciences**

- **Center for Advanced Study of Language**

- **Socio-Environmental Synthesis Center**

- **Fraunhofer Center for Software Engineering**