USC | IMSC

A NATIONAL SCIENCE FOUNDATION
ENGINEERING RESEARCH CENTER

SAI

media immersion environment (systems architecture)

software architecture for immersipresence

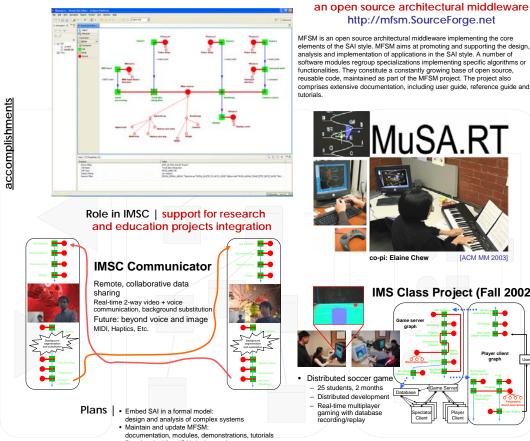Graduate student: Cheng Zhu

Project leader: Alexandre R.J. François

Research goal | a universal framework for the distributed implementation of algorithms and their easy integration into complex systems

research approach

SAI specifies an architectural style, whose underlying extensible data model and hybrid (shared memory and message-passing) distributed asynchronous parallel processing model allow natural and efficient manipulation of generic data streams, using existing libraries or native code alike. The modularity of the style facilitates distributed code development, testing, and reuse, as well as fast system design and integration, maintenance and evolution. A graph-based notation for architectural designs allows intuitive system representation at the conceptual and logical levels, while at the same time mapping closely to the physical level.

[ICSE 2004]

VisualSAI: an architectural design and analysis graphical environment

VisualSAI is a graphical environment for visually creating and analyzing component-based architectural designs in the SAI style. It is implemented in Java, as a plug-in for the open source *Eclipse* platform. Features support conceptual level design, logical level specification and physical level description (automatic code generation)

MFSM
an open source architectural middleware
http://mfsm.SourceForge.net

MFSM is an open source architectural middleware implementing the core elements of the SAI style. MFSM aims at promoting and supporting the design, analysis and implementation of applications in the SAI style. A number of software modules regroup specializations implementing specific algorithms or functionalities. They constitute a constantly growing base of open source, reusable code, maintained as part of the MFSM project. The project also comprises extensive documentation, including user guide, reference guide and tutorials.

accomplishments

MuSA.RT

co-pi: Elaine Chew   [ACM MM 2003]

Role in IMSC | support for research and education projects integration

IMSC Communicator

Remote, collaborative data sharing
Real-time 2-way video + voice communication, background substitution
Future: beyond voice and image
MIDI, Haptics, Etc.

IMS Class Project (Fall 2002)

Game server graph

Player client graph

- Distributed soccer game
  - 25 students, 2 months
  - Distributed development
  - Real-time multiplayer gaming with database recording/replay

Plans |
- Embed SAI in a formal model: design and analysis of complex systems
- Maintain and update MFSM: documentation, modules, demonstrations, tutorials
- Develop the VisualSAI design environment
- Promote the use of SAI through workshops
- Design integrated systems supporting the IMSC visions