Makoto Sadahiro

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Specialty

Data Analysis, Scientific and Information Visualization, Immersive Environment and User Interface

Professional Experience

Texas Advanced Computing Center, The University of Texas at Austin July 2003 - present
Research Engineering/Scientist Associate

Deploy large scale multi-pipe graphics systems and GPU-accelerated remote visualization systems

- Deploy immersive environment (early CAVE system, a type of virtual reality) over multiple large scale graphics systems in 360 degree surround-display space; 3-D stereo glass and head tracking system. Previously, all components were used independently. The integration enabled entire space to function as one immersive environment utilizing entire 360 degree surround display space from one software application which enabled user to examine data intuitively from inside their data. Since early immersive systems were still premature and only few in nation, our feedback caused a hardware manufacture to revise their specification which benefited many users. C/C++, VRPN, CAVElib, unix system facility, etc.
- Develop user-interface hardware and software to support better immersive environment usability; Develop API for virtual keyboard, wireless PDA connectivity with AUX keys, haptic feedback. Previously, immersive environment lacked both alpha/numeric input methods and sensory feedbacks within the immersive applications. This development created way to type and feel objects in immersive space. C/C++, OpenGL, CAVElib, OOPic, etc.
- Work with vendors for customized hardware, software, infrastructure installation, and their revisions
- Build and test software environment for production systems

Develop software tools for collaboration projects and internal use

- Information visualization and data analysis to evaluate learning process in children through their game play; Data process and proto-type vis, allowing education researchers to analyze the data and develop better methodology of the study. C/C++, STL, boost libraries, VisIt, ParaView, etc.
- Video parser for free open-source video archive server; Open Video Digital Library Toolkit project was to deliver the first free open-source video archiving server, especially targeted to budget-conscious non-commercial institutions. Previously, the toolkit was missing customized open source free video parser to create meta-image/movie digests of movie files. The parser completed the toolkit for distribution. C/C++, gd Library and ffmpeg libraries, etc.
- Visualization and its parallel composition from very large spatially/temporally segmented simulation results; develop optimized time-sensitive tool. C/C++, STL, and boost libraries, etc.
- Development of feature segmentation tool for seismic volume; The tool is to reconstruct the geometry of sub-surface river channels for physical analysis in order to determine mineral deposits, etc. C/C++, STL, gd Library, etc.

Consult and train users in data analysis and scientific visualization topics

- Support nation-wide consulting system to academic researchers in person and via TeraGrid consulting system for various fields of disciplines; The level of consulting varies from directing researchers to right tools to collaboration to develop software in order to produce visualization results for publication use, etc.
- Deploy low-cost remote training web-casting and recording infrastructure for training; The infrastructure was built entirely with commodity hardware and software. This enabled real-time training sessions to researchers in nation-wide who can not participate at on-site training sessions.
- Support other on-campus department/facilities for the specification and configuration of their visualization and 3-D stereo display systems
- Create user guide for production graphics systems and immersive environment
- Coordinate scientific visualization training and contents

Manage visualization laboratory

- Maintain overall lab functionality; Manage lab proctors for their duties and internal projects. Maintenance/construction negotiations. Coordinate with system admin to keep systems healthy.
- Manage event schedules, and perform system demonstrations for conferences; IEEE Visualization, IEEE Super computing, VIP tours to the lab, and general lab tours, etc.

Hitachi Medical Corporation, MRI Systems Development division (Japan) January 2003 - June 2003
Software Developer

Various tasks about the imaging software for Hitachi's MRI medical scanner systems operation console

- Manage specification and development schedule for a new medical imaging system product
- Develop new features and maintain imaging/navigation software components
- Test conformance and data integrity of communication with DICOM standard and with other medical equipment manufactures; build DICOM test environment for DICOM communication.
- Research in imports/exports regulations for technology; encryption.
- Demonstrate Hitachi MRI products in medical trade shows

The Center for Computational Visualization, June 1998 - January 2001
Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin
Research Engineer Intern / Undergraduate Research Assistant

Create and administrate internal data repository

- Build automated demonstration for repository data; Develop data processing and validation tools for scientific data. Fossil/medical (CT/MRI/RGB), geophysics (seismic). Iso-contouring, iso-surfacing of N-dimensional volume data, normalizing geometry data, parsing VRML. Dynamic data processing has largely reduced the usage of disk space by reduction of redundancy. C/C++, Tcl/Tk, shell script, etc.
- Create in-house multipurpose file format specifications
- Document in-house custom software manual and data repository meta-data

HouseWorks Software Inc. (Austin TX) August 1995 - March 1996
Lead Artist

Design various aspects of early 3-D first-person-perspective shooter game

- Design game user interface, environment, level design, enemy characters, and textures library, etc.

Education

The University of Texas at Austin	M.S.I.S.	Information Science	May 2012
The University of Texas at Austin	B.S., B.A	Computer Science	May 2003/2002
University of Massachusetts at Dartmouth	B.F.A.	Photo/Electronic Imaging	May 1995

Platforms Linux, Apple OS/X, IRIX, Microsoft Windows/mobile, Solaris, AIX, NEXT/OPENSTEP, OOPic, Amiga, MS-DOS, VMS, etc.

Languages / APIs C/C++, shell script, ffmpeg, gd lib, boost, STL, OpenGL, CAVElib, HTML, VRPN, Motif, OpenInventor/VRML, Tcl/Tk, Pascal, LISP, BASIC, etc.

Applications / Tools vGeo, VisIt, Amira, Paraview, AVS, Quest|3D, VRScape, OpenDX, LightWave, Adobe Photoshop, Central Testing Node, Macromedia Director, Adobe PageMaker, Quark Xpress, Adobe Premier, SOFTIMAGE|DS, 3D StudioMax, etc.

Further Interests Human Computer Interaction (Reduction of human perceptual latency, Natural user interfaces), Information auralization, etc.

Other skills and interests Native Japanese speaker, Playing cello, Flying radio control sailplane, etc.