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Objective

To obtain a position in the field of computer graphics and visualization as a Graphics Software Engineer

Education

- Purdue University, West Lafayette, IN, USA Jan. 2007 ~ Aug. 2012 (expected)
Direct Ph.D. student in Electrical Computer Engineering (Major area: Computer Engineering)
Thesis: Information-assisted data exploration, analysis, and visualization
Advised by Dr. David S. Ebert

Professional Experience

- Graduate Research Assistant Jan. 2007 ~ Present
Member of the Purdue University Rendering and Perceptualization Laboratory
School of Electrical Computer Engineering, Purdue University
- System Software Engineer May 2006 ~ Aug. 2006
NVIDIA Korea, Korea (South)
- Senior Software Engineer Sep. 1997 ~ Dec. 2005
Virtual Reality and Simulation team
RealTimeVisual, Korea (South)

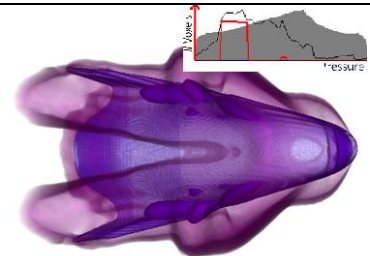
Technical Skills

- Programming C/C++, Java
OpenGL, Cg toolkit, GLSL, CUDA, MPI, TBB
OpenGL ES (Android NDK, iOS), OpenGL Performer, OpenCV, GDI+, CAVELib
Qt, MFC
HTML, ASP, JSP, J2EE (Java Servlet, JNI), Javascript
- Development tool Visual Studio, QtCreator, Eclipse, TortoiseSVN, Perforce, Doxygen
- Platforms Windows, Linux (Ubuntu), Maemo, Android

Projects

Graduate Research: Ph.D. (Jan. 2007 ~ Present)

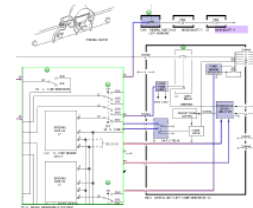
- Jan. 2010 ~ Present **XD data analysis and visualization**
- Developing a scalable/parallel volume visualization framework for large-scale scientific volume data
 - Information-metric assisted volume data exploration techniques using spatial statistics (entropy, standard deviation, and skewness)
 - Feature sculpting methods for multivariate volumetric data exploration
 - Scientific data processing on the GPU



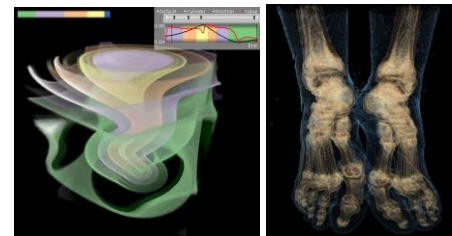
- Sep. 2008~
Aug. 2010
- Technology Assisted Dietary Assessment (TADA)**
- Performed research on 3D volume estimation from a single view image on mobile devices
 - Researched and developed volume estimation methods by reconstructing 3D models for identified food items
 - Developed interfaces (manipulators of reconstructed 3D models) for visual refinement on mobile devices



- Jan. 2008 ~
Sep. 2008
- Novel Presentation Methods for Technical Data**
- Performed research on visualization of very large schematic diagrams for aircraft maintenance
 - Developed a context-preserving interactive visualization system for technical diagrams, a SVG (Scalable Vector Graphics) renderer
 - Performed the user study to evaluate the effectiveness of the visualization



- Jan. 2007 ~
Dec. 2010
- Hub-based scientific visualization**
- Researched on a feature-driven data exploration and non-parametric direct volume rendering techniques



Software Development: Graduate Research

- Apr. 2009~
May. 2009
- OpenGL ES 2.0 Validation Framework**
- Developed a framework to validate an OpenGL ES 2.0 compiler through test cases and generate HTML documents for reporting the test results.
 - Implemented the OpenGL ES1.1 pipeline using OpenGL ES 2.0

Software Development: Freelancer

- Sep. 2006~
Nov. 2006
- Mobile 3D Game Engine**
- Developed a reference implementation and a verification tool for a mobile 3D engine specification
 - Implemented all the nodes/objects (e.g., lighting, geometry, skinning, morphing, key-frame animation) for constructing scene graphs

Software Development: NVIDIA Korea

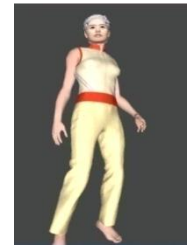
- May. 2006~
Aug. 2006
- Direct 3D Mobile Driver**
- Implemented the Direct 3D Mobile specification (DirectX 7): lighting & transformation, management of rendering states, and texture mapping

Software Development: RealTimeVisual

- Oct. 2003~
Dec. 2005
- 3D application for NIFV(Next Infantry Fighting Vehicle) embedded training system**
- Developed real-time 3D visualization modules for simulation, special effects such as IR(Infra Red) and headlight.
 - Developed large irregular grid terrain data process and rendering modules, (e.g., continuous level of detail, discrete level of detail, and quad tree)



- Jun. 2005 ~
Aug. 2005
- Ubiquitous Virtual Fashion System**
- Developed shaders for rendering clothes using bump mapping and skins using HDRI (high dynamic range images) environment mapping
 - Implemented multithreaded data handling modules and data animation modules - morphing animation and rigid body animation



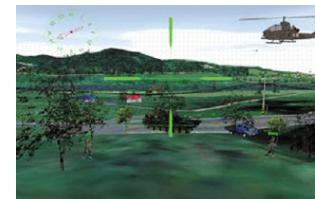
- Mar. 2004 ~
Jun. 2004
- Cyber Museum**
- Developed multiple user interaction system to explore interactive 3D contents
 - Implemented a XML-based scenario descriptor (3D scenes and interactions, voice activations)



- Sep. 2004~
Dec. 2004,
Dec. 2003~
Feb. 2004
- Virtual Automobile Design Reviewer**
- Developed the virtual prototyping system using OpenGL Performer and CAVELib, interactions with 3D CAD models using CyberTouch and Wanda, and an authoring tool for VR user interactions, 3D menu, scene graph of 3D CAD models
 - Developed a realistic exterior rendering module using ClearCoat and OpenGL Optimizer



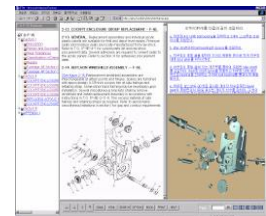
- Mar. 2002 ~
Dec. 2003
- 3D Synthetic Combat Simulation & Visualization Engine**
- Developed 3D visualization applications, terrain attribute management modules, and character animation modules



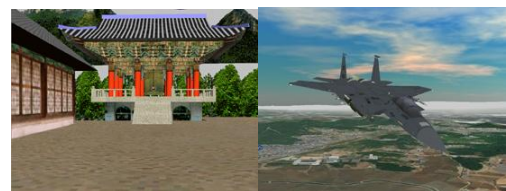
- Jan. 2001 ~
Dec. 2002
- 3D Virtual Shopping Mall Rendering and Design Tool**
- Developed a ActiveX control for VRML 97 & X3D data rendering
 - Implemented an image library for **HDRI** (high dynamic rendering image), incorporated it (environmental texture mapping) to the 3D rendering engine (TOV toolkit), and developed the tool for editing 3D scene graphs and **HDR texture mapping**



- Jan. 1999 ~
Aug. 2000
- Next Generation Intelligent Diagnostic System**
- Developed an authoring tool of SAE J2008 data (XML) model and an ActiveX control for assembling and disassembling 3D part models
 - Implemented the VRML EAI (Extern Authoring Interface)



- Sep. 1997~
Dec. 1999
- TOV Toolkit (3D Rendering Engine)**
- Developed a scenegraph-based real-time 3D rendering engine based on VRML 97 specification



Publications

(Journal Papers)

- I. Woo, R. Maciejewski, K. P. Gaitehr, D. S. Ebert. "Feature-driven Data Exploration for Volumetric Rendering," *IEEE Transactions on Visualization and Computer Graphics*, to appear, 2012
- F. Zhu, M. Bosch, I. Woo, S. Kim, C. J. Boushey, D. S. Ebert, E. J. Delp. "The Use of Mobile Devices in Aiding Dietary Assessment and Evaluation." *IEEE Journal of Selected Topics in Signal Processing*, Vol. 4, Issue 4, pp. 756-766, Aug. 2010.
- R. Maciejewski, I. Woo, W. Chen, D. S. Ebert. "Structuring Feature Space - A Non-Parametric Method for Volumetric Transfer Function Generation," *IEEE Transactions on Visualization and Computer Graphics*, 15(6): 1473-1480, Nov./Dec. 2009.
- I. Woo, S. Kim, R. Maciejewski, D. S. Ebert, T. D. Ropp, K. Thomas. "SDViz: A Context-Preserving Interactive Visualization System for Technical Diagrams." *Computer Graphics Forum*, 28(3), pp. 943-950, June 2009.
- M. Usman, H. Ryu, I. Woo, D. S. Ebert and G. Klimeck,, "Moving towards nano-TCAD through multi-million atom quantum dot simulations matching experimental data", *IEEE Transaction on Nanotechnology*, Vol. 8, No. 3, pp. 330-344, May 2009.
- G. P. Lansbergen, R. Rahman, C. J. Wellard, I. Woo, J. Carol, N. Collaert, S. Biesemans, G. Klimeck, L. C. L. Hollenberg and S. Rogge. "Gate-induced quantum-confinement transition of a single dopant atom in a silicon FinFET", *Nature Physics* 4, 656, 2008.

(Conference Papers)

- J. Chae, I. Woo, S. Kim, R. Maciejewski, F. Zhu, E. J. Delp, C. J. Boushey, D. S. Ebert. "Volume Estimation Using Food Specific Shape Templates in Mobile Image-Based Dietary Assessment." *IS&T/SPIE Computational Imaging IX, Proceedings of SPIE*, Vol. 7873, 2011.
- S. G. Larew, R. Maciejewski, I. Woo, and D. S. Ebert. "Spatial Scan Statistics on the GPGPU." *Proceedings of the Visual Analytics in Healthcare Workshop at the IEEE Visualization Conference*, October 2010.
- S. Kim, I. Woo, R. Maciejewski, D. S. Ebert, Ti. Ropp, K. Thomas. "Evaluating Effectiveness of Illustrative Visualization of Schematic Diagrams for Maintenance Tasks." *The 7th Symposium on Applied Perception in Graphics and Visualization*, pp.33-40, 2010.
- S. Kim, I. Woo, R. Maciejewski, D. S. Ebert. "Automated Hedcut Illustration Using Isophotes." *The 10th Symposium on Smart Graphics 2010*, pp.172-183, 2010.
- I. Woo, K. Ostmo, S. Kim, D. S. Ebert, E. J. Delp, C. J. Boushey, "Automatic portion estimation and visual refinement in mobile dietary assessment." *Computational Imaging VIII, IS&T/SPIE Electronic Imaging 2010*, Vol. 7533, pp. 75330O-75330O-10 (2010).

Honors & Certificates

- Mentor for Vertically Integrated Projects: the Visual and Data Analytics team in School of Electrical and Computer Engineering, Purdue (Aug. 2011 ~ Present). <http://pixel.ecn.purdue.edu:8090/web/vip-class/>
- Mentor for the SURF (Summer Undergraduate Research Fellowships) 2010, Purdue University (May 2010 ~ Aug. 2010)
- Mentor for Vertically Integrated Projects: the GPGPU team in School of Electrical and Computer Engineering, Purdue (Jan. 2007 ~ May 2010).
- **Research Assistantship**, Purdue University Rendering & Perceptualization Lab., School of Electrical and Computer Engineering, Purdue University (Jan. 2007 ~ Present)
- **Certificate** of KIPA (Korea SW Industry Promotion Agency) Authorized **Software Architecture Design & Analysis**
- Chairman of the Computer Programmers' Union, a computer programming club in the Computer Engineering Department at Dong-A University (1996)

References

- Available on request