

Kyle Hayward

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OBJECTIVE

Obtain a graphics programming position.

EDUCATION

Purdue University

2009

West Lafayette, IN

- Bachelors of Science, Computer Science

GPA: 3.35

COMPUTER SKILLS

Languages

- Proficient in: C/C++, C#, Java, HLSL/Cg
- Experience in: MIPS assembly

APIs

- Microsoft DirectX / MDX, XNA, OpenGL
- JSR 118, Swing
- FMOD

Platforms

- Windows, Unix/Linux, Nintendo Wii

Software

- Performance Analysis: PIX, NVPerfHUD
- Frameworks: .Net
- Source Control: Visual SourceSafe, SVN
- IDEs: VS 7.1/8/9, Radix, Eclipse, Netbeans

Math

- Calc I, II, III
- Linear Algebra, Induction

WORK EXPERIENCE

Software Developer – Intern

5/2008 – 8/2008

Gabriel Entertainment, Indianapolis IN

- Wrote the majority of the shaders for an upcoming Nintendo Wii title. Shaders ranged from simple coloring, to texturing + diffuse lighting + specular reflection + environment reflections + projected cloud map.
- Developed the Wii port of the audio framework. Functions include: playing, pausing, and stopping audio samples, streaming from disc, and threaded background loading of streams.
- Currently developing a rail-type shooter mini-game to be included in the final product.

Software Developer – Intern

5/2007 – 8/2007

Flexware Innovation Inc., Fishers IN

- Tested and fixed bugs in the update of their *Manufacturing Director* software platform.
- Developed an application in .Net that allowed the user to visually add and delete available peer relationships that were defined in the database; Extension was included in their 3.2 release.
- Ported, optimized and added functionality to an older VB.Net framework to their current platform. Functions included: Refactoring preview, a dynamic property grid used in the Form, dynamic drop-down lists, copying while retaining all database information and relationships.

RESEARCH

Computer Graphics Researcher

1/2008 – 5/2008

Computer Graphics and Visualization Lab, Purdue University

- Developed and researched methods for applying Non-pinhole Impostors for approximating scene geometry for interactive reflections and refractions. Camera models included the Single Pole Occlusion Camera and the Graph Camera.
- Non-pinhole impostors capture scene geometry not scene by pinhole camera depth images. These impostors support view-independent reflections and refractions that allow translations in the view point; allowing one to see parts of the object in the reflection that would not be seen by billboard or depth impostors, while retaining one single depth and image buffer.

QUALIFICATIONS

3D Programming

- Developed a Terrain renderer that included multi-texturing, water simulating *reflection*, *refraction*, and *coastal optical* properties, *Atmospheric Scattering* for correct sky representation and aerial perspective, *Volumetric Clouds*, *Frustum culling* and *Quadtrees*.
- Developed a Software Rasterizer. All math was handled by the rasterizer, and the only API call used was `glDrawPixels()`. Included the following effects: *Gouraud & Blinn-Phong* shading, *Directional & Point* lighting, *Perspective correct texture mapping*, *Parallax & normal* mapping, *Projective texturing*, *Shadow mapping*, *Environment mapping*, *Distance Fog*, *Depth of Field*, *Bilinear Filtering*.
- Developed a Post-Processing framework that allows for easily chaining together multiple, arbitrary effects that included: motion blur, depth-of-field, bloom, and simple distortion.
- **Other applications include:**
 - Linear and cubic spline interpolation for camera animation
 - Dual-Paraboloid mapping for environmental reflections and shadows.
 - Billboard and depth impostors for reflections
 - Volumetric Rendering
 - Variance shadow mapping

2D Programming

- Worked with a team to develop a map editor and viewer using a graph in Java/Swing.
- Developed a mobile phone game (Wak-a-Mole clone) in JSR 118.

General Programming

- Collaborated with a team to develop a multi-threaded http server in C.
- Developed a search engine and web crawler in C++ using AVL Trees and Hash Tables.
- Developed a compiler for the MiniJava language. Components included: *Parser*, *Semantic Analyzer*, *IR Translation*, *Liveness Analysis*, and *Instruction Selection*.
- Implemented `malloc()` and `free()` memory allocation using segregated free lists in C.
- Developed a course tools application that allowed: adding/removing classes and students, modifying student grades, reports, and sending class messages. Implemented with a SQL database and a Java/Swing front end.

COURSES

- CS 180: Java Programming
- CS 240: C Programming
- CS 250: Computer Architecture & Assembly
- CS 251: Data Structures & Algorithms
- CS 334: Computer Graphics
- CS 348: Database Programming
- CS 352: Compilers
- CS 354: Operating Systems
- CS 381: Algorithms
- CS 530: Scientific Visualization
- CS 535: Advanced Graphics
- CGT 581: OpenGL Programming