

Micah Taylor

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Research interests:

Interactive sound propagation : Realtime ray tracing : Visibility & rendering :
Parallel & high performance computing

Education:

- PhD - Computer Science, May 2014
“Interactive Sound Propagation for Massive Multi-user and Dynamic Virtual Environments”
University of North Carolina, Chapel Hill
- MS - Computer Science, 2012
University of North Carolina, Chapel Hill
- BS - Computer Science, 2004
Technical Translator in German, 2004
Rose-Hulman Institute of Technology

Projects:

- Invented and supervised creation of an [Auditory Display Headset](#) capable of creating audio landscapes from real world objects.
- Created [libchb](#), a library to display images with Unicode characters and ANSI color codes in text mode terminals.
- Designed and developed [CourseUp](#), a domain specific language for defining courses in a flexible and intuitive format.
- Implemented platform independent [realtime ray tracer](#). Supports multiple hierarchy structures, split-selectors, shaders, and post-processing.
- Designed and implemented [fast motion](#) blur effects using sample reprojection. Generates similar results to stochastic motion blur at a fraction of the cost.
- Maintain and host my [personal webpage](#). Custom code and design with database backend and light frontend.

Skills:

- Programming
C, C++, Javascript, PHP, Bash, MIPS32, Verilog, and more
- APIs & Tools
OpenGL, OpenMP, CUDA, SFML, SDL, Blender, Linux, Final Cut, Audacity, Apache, Git, GDB, MSVS, and more

Work experience:

- [Volition](#) - Champaign, IL, 2019-present
Engine Programmer
 - Worked on upcoming Saints Row title
 - Designed new and exciting rendering and simulation features
- [Kixor Technologies](#) - Terre Haute, IN, 2018-present
Founder
 - Designed Markdown/LaTeX based [course description language](#)
 - Invented and developed [auditory display headset](#)
- [Rose-Hulman Institute of Technology](#) - Terre Haute, IN, 2012-2019
Associate Professor with Tenure
 - Taught 9 introductory and elective courses per year
 - Served as academic adviser to 25 CS/SE students per year
 - Managed over 100 student projects, including custom CPUs, realtime ray tracers, and automatic parallelization
 - Developed private git repository system with mass populate and pull capabilities
- [Green Hills Software](#) - Santa Barbara, CA, 2018 Summer
Software Engineer
 - Investigated and documented advanced debugging techniques
 - Designed undergraduate course on robust and repeatable debugging processes
- [Impulsonic \(now Valve\)](#) - Carrboro, NC, 2016 Summer
Senior Researcher
 - Developed proprietary acoustic algorithms for game middleware
 - Developed software with team in-office and remotely
- [Dolby](#) - San Francisco, CA, 2010 Summer
Research Intern
 - Designed fast GPU and CPU based audio rendering system
 - Collaborated with senior researchers on large scale acoustic rendering systems
- University of North Carolina, [Gamma group](#) - Chapel Hill, NC, 2007-2012
Research Assistant
 - Created interactive [GPU based sound propagation system](#) for early specular reflection and diffraction
 - Designed interactive [acoustic simulation](#) with diffuse, specular, and diffraction components
 - Developed [diffraction tracing](#) using real-time ray frustum tracer
- [Baker Hill](#) - Carmel, IN, 2004-2007
Software Engineer
 - Served as lead designer on critical path projects for major loan origination products
 - Developed tools to automate refactoring of over 50,000 lines of code
 - Designed and implemented automatic build and deploy process across multiple platforms and devices

Teaching experience:

- [Rose-Hulman Institute of Technology](#) - Terre Haute, IN, 2012-2019
Associate Professor with Tenure
 - Taught over 1000 students in small face-to-face classes (<25 students per class) at the [top undergraduate engineering school](#) in the US
 - Iteratively improved weak intro sequence, resulting in large improvements in student learning (from 3.2 to 4.3 out of 5)
 - Served on institute committees including Dean’s task force on Creating a Culture of Integrity, Quality of Education, and International Programs
 - Courses taught:
 - [CSSE232 Computer Architecture](#) - 21
 - [CSSE132 Introduction to Computer Systems](#) - 14
 - [CSSE351 Computer Graphics](#) - 6
 - [CSSE451 Advanced Computer Graphics](#) - 4
 - [CSSE220 Object-Oriented Software Development](#) - 1
 - [CSSE230 Data Structures and Algorithm Analysis](#) - 1
 - [CSSE490 The Art and Science of Debugging](#) - 1
 - [CSSE491 Independent study](#) - 6 advised
 - [CSSE497 Senior thesis](#) - 3 advised
 - Students appreciate my enthusiastic teaching style and I consistently receive high student evaluation ratings (4.7/5). Some students comments:
 - “Micah is a very approachable and intelligent teacher, he genuinely wants his students to perform and makes the class’s learning environment both interesting and fun through his personality.”
 - “Micah was a very knowledgeable and interesting professor. His quirky mannerisms made it easy to pay attention in class, but his teaching was serious and easy to understand.”
- [Connecting with Code](#) - Terre Haute, IN, 2019 Summer
Instructor
 - Taught beginner Scratch and Microbit coding
 - Created lessons suited for 6-8 year old students
 - Helped classroom of 10 students create [fun games](#) in half-day camp setting
- University of North Carolina - Chapel Hill, NC, 2011 Fall
Instructor - COMP575 Introduction to Computer Graphics
 - Full responsibility for course, including structure and lectures
 - Designed homeworks, quizzes, and programming assignments
 - Held office hours and graded assignments

Advising:

Undergraduate theses:

- [Splashes and Water Wave Packets](#), Xingfang Yuan, 2018
Winner of best thesis award
- [Automatic Parallelism in Javascript](#), Rose Reatherford, 2016
- [VR Cultural Heritage Sites](#), Si Faye Li, 2016

Independent studies

- Proprietary High Performance Shortest Euclidean Path, Charles Horton, Xingfang Yuan, 2017
- Bluetooth Driver for XBOX 360 Controllers, Josh Maurer, 2016
- VGA Driver for Spartan 6 FPGA, Jake Whiteley, 2016
- Web Based Acoustic Simulator, Xianbo 'Francis' Meng, 2015

Publications:

Journals and conferences

1. Micah Taylor. [CourseUp: Human readable course language](#), Journal of Computing Sciences in Colleges 2018
2. Micah Taylor, Sid Stamm, and Christine Taylor. [The impact of changing homework frequency in a computer architecture course](#), Journal of Computing Sciences in Colleges 2018
3. Micah Taylor and Francis Meng. [Web-based geometric acoustic simulator](#), 23rd International ACM Conference on 3D Web Technology 2018
[10.1145/3208806.3208817](#)
4. Micah Taylor, Anish Chandak, Qi Mo, Christian Lauterbach, Carl Schissler, and Dinesh Manocha. [Guided Multiview Ray Tracing for Fast Auralization](#), IEEE Transactions on Visualization and Computer Graphics 2012 (26%)
[10.1109/TVCG.2012.27](#)
5. Lakulish Antani, Anish Chandak, Micah Taylor, Dinesh Manocha. [Direct-to-Indirect Acoustic Radiance Transfer](#), IEEE Transactions on Visualization and Computer Graphics 2012 (26%)
[10.1109/TVCG.2011.76](#)
6. Lakulish Antani, Anish Chandak, Micah Taylor, Dinesh Manocha. [Efficient finite-edge diffraction using conservative from-region visibility](#), Applied Acoustics 2011 (43%)
[10.1016/j.apacoust.2011.09.004](#)
7. Anish Chandak, Lakulish Antani, Micah Taylor, Dinesh Manocha. [Fast and Accurate Geometric Sound Propagation using Visibility Computations](#), International Symposium on Room Acoustics 2010
8. Micah Taylor, Anish Chandak, Lakulish Antani, Dinesh Manocha. [RESound: Interactive Sound Rendering for Dynamic Virtual Environments](#), 17th International ACM Conference on Multimedia 2009 (16%)
[10.1145/1631272.1631311](#)
9. Anish Chandak, Lakulish Antani, Micah Taylor, Dinesh Manocha. [FastV: From-point Visibility Culling on Complex Models](#), 20th Eurographics Symposium on Rendering 2009 (29%)
[10.1111/j.1467-8659.2009.01501.x](#)
10. Micah Taylor, Anish Chandak, Zhimin Ren, Christian Lauterbach, Dinesh Manocha. [Fast Edge-Diffraction for Sound Propagation in Complex Virtual Environments](#), EAA Symposium on Auralization 2009
11. Anish Chandak, Christian Lauterbach, Micah Taylor, Zhimin Ren, Dinesh Manocha. [AD-Frustum: Adaptive Frustum Tracing for Interactive Sound Propagation](#), IEEE Transactions on Visualization and Computer Graphics 2008 (26%)
[10.1109/TVCG.2008.111](#)

Technical reports

1. Micah Taylor, Nicolas Tsingos, Dinesh Manocha. [Rendering environmental voice reverberation for large-scale distributed virtual worlds](#), 2014
2. Lakulish Antani, Anish Chandak, Micah Taylor, Dinesh Manocha. [Direct-to-Indirect Acoustic Radiance Transfer](#), 2010
3. Lakulish Antani, Anish Chandak, Micah Taylor, Dinesh Manocha. [Fast Geometric Sound Propagation with Finite Edge Diffraction](#), 2010

Patents

1. [US 8995675](#) Methods and systems for direct-to-indirect acoustic radiance transfer, Anish Chandak, Lakulish Antani, Micah Taylor, Dinesh Manocha
2. [US 8958567](#) Method and system for split client-server reverberation processing, Nicolas Tsingos, Micah Taylor
3. [US 8847695](#) Methods, systems, and computer readable media for fast geometric sound propagation using visibility computations, Anish Chandak, Lakulish Antani, Micah Taylor, Dinesh Manocha

Other

- Micah Taylor, Anish Chandak, Lakulish Antani, Dinesh Manocha, [Interactive geometric sound propagation](#), EE Times, 2010
- Micah Taylor, Anish Chandak, Lakulish Antani, Dinesh Manocha, [Interactive Geometric Sound Propagation and Rendering](#), Intel Academic Spotlight, 2010
- Micah Taylor, Anish Chandak, Zhimin Ren, Christian Lauterbach, Dinesh Manocha. Fast edge diffraction for sound propagation in complex virtual environments, [Acoustical Society of America's North Carolina Chapter](#) (Best presentation award), 2009