

Ian Mallett

Inquire for additional contact information
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SELECTED EDUCATION

University of Utah, Salt Lake City, Utah, USA 2014 – 2018
Doctor of Philosophy (Ph.D.) in Computing (Expected)

University of New Mexico, Albuquerque, New Mexico, USA 2010 – 2014
Bachelor of Science (B.S.) in Computer Science
Departmental honors
Undergraduate thesis (see research; adviser Dr. Lance R. Williams)

Bachelor of Science (B.S.) in Pure Mathematics
Outstanding undergraduate student

Summa Cum Laude (With Highest Honors)
Dean's List
GPA: 4.03
 $\Phi\K\Phi$ Honor Society

SELECTED SKILLS

Languages
English (native)
French (elementary)

Programming Languages
Fluent: C, C++, Python (2.* and 3.*), GLSL
Familiar: C#, Java, Scheme (Lisp), MATLAB, OpenCL Kernel
Web/Misc.: HTML, PHP, UML, \LaTeX

Technologies and Skills
OpenGL, OpenCL, GPGPU algorithms
MSVC, gcc/g++/Clang, other dev. tools, Blender, office tools, misc. Adobe products
Real/Complex Analysis, Number Theory, Differential Equations, Dynamical Systems, Descriptive/Inferential Statistics, Vector and Higher-Dimensional Calculus, Abstract Algebra, Algebraic and General Topology
Algorithmic Analysis

SELECTED WORK AND TEACHING EXPERIENCE

UNM CS TA

UNM CS 132L (Python Programming) Fall 2012

UNM CS 152L (Java Programming) Fall 2012, Spring 2013

UNM CS 241L (Data Structures in C) Spring 2011, Spring 2013

UNM CS Tutor Fall 2011 – Spring 2014

New Mexico Supercomputing Challenge

Cotaught graphics courses and taught thermodynamic FEM courses 2012

Taught graphics course and cotaught statistical analysis courses 2013

Bennett Design LLC, Contractor 2011

**SELECTED
RESEARCH**

Graphics Research Projects

First author on paper targeting SIGGRAPH 2016

Author on paper targeting SIGGRAPH 2016

Author on paper targeting HPG 2016/SIGGRAPH 2016

First author on paper targeting HPG 2016

First author on paper targeting second-tier conference (extension of undergraduate thesis)

Coauthor on paper targeting second-tier conference

First author on paper targeting SIGGRAPH Asia 2016

“Dot-Product Reparameterizations of Tabular Isotropic BSDFs”

Undergraduate thesis

First place UNM CSSC

April 2014

“Anisotropic Texture Filtering using Line Integral Textures” first author (Vahid Noor-mofidi coauthor), unpublished

Internship at NVIDIA Research Redmond - work on VR-related rendering issues

Graphics Groups

University of Utah Hardware Ray Tracing Research Group

Fall 2014 – Present

Research Assistant at the UNM Advanced Graphics Lab

Fall 2010 – Spring 2014

Real-time rendering algorithms, light transport, and GPGPU

**SELECTED
EXTERNAL
PROJECTS**

Selected GPGPU Projects:

GPU Verlet cloth simulation implemented in OpenCL

GPU grid-based fluid simulation implemented in OpenCL

GPU particle system implemented in OpenCL with OpenGL interop.

GPU marching cubes/tetrahedrons implementation

Selected Graphics Projects

Several implementations of the graphics pipeline (including on Arduino in 88 bytes)

CPU ray tracer and path tracer

Whitted, backward/forward path tracing, and hybrid photon mapping renderer. Features optimized BVH and octree, (glossy) reflection/refraction, depth of field, motion blur, spectral rendering/chromatic aberration/dispersion, reconstruction filtering, Poisson/Halton/Stratified sample generation, and HDR and correct colorimetry.

GPU forward path tracer

Up to 200 million rays/second on GeForce GTX 580M, depth of field, reflection/refraction, arbitrary BSDFs

GLSL/OpenCL 2D/3D GPU fractal raytracer

Distribution ray tracing, depth of field, distance estimation

Realistic skin shading implementation (realtime texture-space subsurface scattering approximation)

glLib: an extremely powerful C++ OpenGL rendering toolkit

Features procedural texturing, (multisampled) FBOs, GLSL autogeneration, post-processing, fluid/cloth/particles as above, basic graphics algorithms (per-pixel lighting, billboard, cubemapping, normalmapping, shadowmapping, geometry shader stencil shadowing, parallax (occlusion) mapping, hardware instancing and tessellation, etc.), advanced graphics algorithms (single-pass depth peeling through shader mutexes, vertex splatting for subsurface scattering, screen-space motion blur, causticmapping, etc.), and OpenCL module (supports all features of OpenCL 1.2 including direct writing to renderbuffer/context synchronization).

**SELECTED
MEMBERSHIP**

ACM

ΦKΦ Honor Society