

H. Quynh Dinh

q@hqdinh.com

hqdinh.com

215 West 83rd St. Apt. 5G

New York, NY 10024

646-642-1287

Professional Preparation

Graduate:

Georgia Institute of Technology, Atlanta, GA
Computer Science, M.S. 1999, Ph.D. 2002

Undergraduate:

George Washington University, Washington, D.C.
Computer Engineering, B.S. 1994

Professional Experience:

Principal Computational Geometry Engineer & Slicer Team Lead

2013 – 2017

MakerBot Industries LLC, Stratatsys

- The Slicer team develops the backend software for 3D printers that converts 3D geometry into 2D paths specifying how lines of molten plastic are laid down to build up a physical 3D object. Responsibilities included reviewing software architecture and code, developing new code, bug fixing, and maintaining an Agile workflow with issues tracking and prioritization using Jira. New code development included integration of an open source mesh library and tools for processing 3D geometry.
- As team lead and principal engineer, I impacted the direction of software development for toolpathing, coordinated with software teams that use our backend driver, managed relationships with other slicer teams company-wide in common efforts such as evaluating mesh repair libraries, and submitted and reviewed invention disclosures for patent applications.
- I served as technical lead for an unreleased scanner product that reconstructed surfaces from time-of-flight data. Responsibilities included evaluating hardware options, advising leadership on product viability, coordinating with the selected hardware vendor, and supervising developers on the front end user interface.
- Technical lead for *MakerBot Digitizer Desktop 3D Scanner* (awarded Popular Mechanics 2013 Breakthrough Product). Responsibilities included assessing outcomes and coordinating with mechanical engineering and industrial design teams, with internal software teams responsible for the firmware and the front end user interface, and with a software contractor responsible for the computer vision library.

Associate Member of Research & Development

2009 – 2013

Blue Sky Studios, 20th Century Fox Animation

- Responsibilities included maintaining geometry and rendering code in a proprietary rendering engine, developing new algorithms based on production needs for novel visual effects, and working with production departments (FX, materials, rigging) to enhance the studio's animation and artist toolkits (e.g., Autodesk Maya plugins). Features developed have been used in 3 feature-length animated films.
- Researched and implemented an adaptive refinement algorithm for triangle meshes. The meshes are derived from NURBS surfaces with displacements that add geometric detail to environment models and characters (assets). Triangles are refined only where necessary (e.g., areas of high detail, in view, and projects to a large screen area). Refinement takes into account multiple instances of an asset at different positions and orientations within a scene. This algorithm was used to render tree trunks in the upcoming animated feature film *Epic*, which takes place in a forest.
- Developed an approach to enable assets to maintain position and orientation with respect to the underlying geometry as it shifts (e.g., trees involved in avalanches in *Ice Age 4*).
- Designed and implemented an algorithm to generate vector fields over surfaces. The algorithm requires solving a partial differential equation over the discrete surface. The vectors are then used to procedurally create oriented textures directly on the 3D surface.
- Developed an algorithm to generate a mapping between meshes based on point-based data approximation. The mapping is then used to transfer surface properties from one mesh to another.

Assistant Professor

2002 – 2009

Department of Computer Science, Stevens Institute of Technology

- Developed and implemented algorithms for 3D shape modeling, morphing, volume rendering, 3D shape matching, vector field pattern analysis, and multimedia search. Details at <http://hqdinh.com>
- Supervised research projects implemented by undergraduate, MS, and PhD students on a variety of topics in computer graphics and special effects (see *Projects Supervised* below).
- Primary instructor for introductory and advanced computer graphics and operating systems.

Technical Skills

Programming languages:

Expert: C/C++ (20 years of experience)
Familiar: Python, Javascript, MEL (Maya Embedded Language) script, Perl, Java, SQL

Graphics:

APIs / Shaders: OpenGL, OpenGL Shading Language (GLSL), Nvidia Cg
Software: Autodesk Maya, Blender, Adobe Creative Suite

Film Credits:

Epic. Blue Sky Studios, 20th Century Fox, to be released April 2013. Software/R&D credit.

Ice Age 4: Continental Drift. Blue Sky Studios, 20th Century Fox, released July 2012. Software/R&D credit.

Rio. Blue Sky Studios, 20th Century Fox, released April 2011. Software/R&D credit.

Conference Course Taught:

H.Q. Dinh, S. Lefebvre, F. Gelman, and F. Claux. “*Modeling and Toolpath Generation for Consumer-Level 3D Printing*”, presented at the *ACM International Conference & Exhibition on Computer Graphics & Interactive Techniques (SIGGRAPH)*, 2015.

Selected Publications:

L. Xu, H.Q. Dinh, E. Zhang, Z. Lin, and R.S. Laramée. “*A Distribution-Based Approach to Tracking Points in Velocity Vector Fields*”, *Proceedings of IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2009. [acceptance rate 2009: 26%]

L. Xu and H.Q. Dinh. “*A Local Descriptor for Finding Corresponding Points in Vector Fields*”, *Proceedings of IAPR International Conference on Pattern Recognition (ICPR)*, 2008. [last known acceptance rate (2006): 14%]

G. Slabaugh, H.Q. Dinh, and G. Unal. “*A Variational Approach to the Evolution of Radial Basis Functions for Image Segmentation*”, *Proceedings of IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2007. [acceptance rate 2007: 23.4%]

H.Q. Dinh, T. Yezzi, and G. Turk. “*Texture Transfer During Shape Transformation*”, *ACM Transactions on Graphics*, April 2005, Vol. 24(2), pp.289-310. [impact factor: 4.08]

H.Q. Dinh, G. Turk, and G. Slabaugh. “*Reconstructing Surfaces by Volumetric Regularization Using Radial Basis Functions*”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, October 2002, 24(10), pp.1358-1371. [impact factor: 4.3]

Grants:

H.Q. Dinh, “*Detecting Patterns in Vector Fields*”, Honda Initiation Grant (3% of applicants were awarded across all fields), Honda Research Institute, \$50K, 2009 – 2010.

H.Q. Dinh and E. Fisher. “*SGER: A Transderivational Search Engine for Creative Analogy Generation in Mixed-Media Design*”, National Science Foundation (NSF) CreativeIT, Award# IIS-0742440, \$150K, 2007 – 2009.
