

David Alexander Stuart

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EDUCATION

Master of Science in Computer Science
University of Utah

Salt Lake City, UT
2013

- Committee: Adam Bargteil (chair), Joshua Levine, Cem Yuksel
- Thesis: **Coarse Tetrahedral Meshing for Interactive Simulation**

Bachelor of Science in Computer Science
Bachelor of Science in Mathematics
University of Minnesota

Minneapolis, MN
2010

PROFESSIONAL EXPERIENCE

Personal sabbatical

May 2019—present

During my sabbatical I explored functional programming in the context of game development.

- Released *Peoplemon*, the first commercial role-playing game made entirely in Haskell
- Abstracted engine from *Peoplemon* code, added 3D rendering
- Published research paper at Haskell Symposium 2020

Guitar Player

June 2016—present (hiatus)

Larry and the Millennial Falcons

I am a founding member of a band that puts on live-band karaoke shows.

- Learned, arranged, and performed over 200 songs; adapted to unfamiliar singers
- Bimonthly club show with two 2-hour sets

Tutor

Sept. 2019—May 2020

Brighter Minds SF

I taught algebra, geometry, and calculus to middle and high schoolers in one-on-one sessions.

- Guided students in doing homework, developed enrichment activities
- Helped students improve their grades and outlook on math

Software Engineer

Nov. 2017—May 2019

Machine Zone, Inc.

I and a core R&D team led development of *Crystalborne*, a new genre of game for MZ.

- Implemented animated camera and controllers, billboard rendering, tool interfaces
- Developed tutorials, UI overlays, animation sequences, modular geometry
- Worked closely with art director and artists to plan workflows

Senior Software Engineer
FATHOM

Dec. 2016—Nov. 2017

I led a small team that built and operated a web-based quoting tool for 3D printing.

- Implemented interactive 3D rendering, interface to geometric analysis service
- Established continuous testing infrastructure and practice
- Mentored junior engineers in tests, functional programming, professional development

Senior Software Engineer
Autodesk, Inc.

Sept. 2013—April 2016

I helped develop Bifrost, a platform in Maya for simulating fluids and other phenomena.

- Created Bifrost's first modeling tools for implicit surfaces
- Resolved customer escalation in my first week
- Fully remote member of a distributed team including three Academy Award winners

Before my time on Bifrost I helped develop Tinkercad, a web-based 3D modeling tool.

- Implemented geometric modeling operations
- Added full-stack privacy features for COPPA compliance
- Prototyped novel texture mapping scheme for our BSP-tree geometry representations

Graduate Associate
Disney Interactive

June 2012—June 2013

I helped develop the AI system used in *Disney Infinity*.

- Optimized game engine's implementation of behavior trees
- Created new gameplay features as extensions of AI system
- 3-month internship extended to 12 months

Teaching Assistant
School of Computing, University of Utah

Sept. 2010—May 2012

I helped run courses in computer architecture and scientific computing.

- Held weekly study sessions, assisted students one-on-one
- Corrected homework and exams

Research Assistant
Disney Research Zurich

July 2011—Sept. 2011

For three months I investigated simulation and control problems.

- Devised geometric models of physical phenomena
- Built and measured physical apparatus for evaluating models

Research Assistant
GroupLens Research, University of Minnesota

Feb. 2009—Aug. 2010

I studied the social effects of changes to Wikipedia’s user interface.

- Wrote scripts to scrape Wikipedia and compile databases
- Helped model sentiment in interactions, organized human coding of many interactions

Teaching Assistant
UMTYMP, University of Minnesota

Sept. 2008—May 2009

I helped teach calculus to talented middle-school students.

- Directed 30 study sessions, held call-in office hours
- Wrote 900 detailed homework corrections

TOOLS

Programming languages:

- *Proficient with* C, C++, Haskell, Lisp
- *Competent with (but avoid)* JavaScript, Lua, Python
- *Some experience with* C#, Go, Java

Development environments:

- Git, Perforce, Visual Studio, Vim, Xcode

Libraries/systems:

- Linux, macOS, Maya, MongoDB, OpenGL, Postgres, Riak, SDL, TBB, Unity

PUBLICATIONS

David A. Stuart

Scripted Signal Functions

ACM SIGPLAN International Symposium on Haskell, Virtual Event, August 2020

David A. Stuart, Joshua A. Levine, Ben Jones, Adam W. Bargteil

Automatic Construction of Coarse, High-Quality Tetrahedralizations that Enclose and Approximate Surfaces for Animation

ACM SIGGRAPH Conference on Motion in Games, Dublin, Ireland, November 2013

Aaron Halfaker, Bryan Song, **D. Alex Stuart**, Aniket Kittur, John Riedl

NICE: Social Translucence Through UI Intervention

International Symposium on Wikis and Open Collaboration, Mountain View, California, October 2011

SOLO PROJECTS

Lightarrow/FairyBow

- Interactive 3D graphics in Haskell abstracted over backend (currently GPipe)
- Batched mesh and sprite rendering, animated scene graph

Peoplemon

- Clone and parody of Pokémon Red/Blue for macOS/Linux/Windows
- Commercially released to over 3600 players
- Made from scratch with Haskell and SDL, all original assets

Scheme game programming system

- C extensions to Scheme for quickly writing correct, fast game programs
- Integrates manual and garbage-collected memory allocations
- Efficiently marshals data between language implementations

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- Game and engine made from scratch in C++, for Linux and Windows
- Text rendering, frame-accurate sound looping, animated sprites, twenty-two levels