Alec Rivers

Co-founder
Shaper Tools, Inc.

Email: alec@shapertools.com
Phone: (607) 279-8811
Website: www.alecrivers.com

Videos and academic papers are available on www.alecrivers.com .

EDUCATION:

Massachusetts Institute of Technology, Cambridge, MA
M.S and Ph.D. in Computer Science, 2008 – 2013
Advisor: Frédo Durand
Thesis: Augmented Manual Fabrication Methods for 2D Tool Positioning and 3D Sculpting

Cornell University, Ithaca, NY
B.A. in Computer Science, separate specialization in Russian, 2007
GPA: 3.85

RESEARCH INTERESTS:

I am interested in digital fabrication, computer vision, computer graphics, sketch-based modeling, non-photorealistic rendering, physics-based animation, and any areas where these might overlap.

AREAS OF EXPERTISE:

Algorithm design, image processing, embedded systems development (most substantially for real-time image processing applications on the Raspberry Pi), hardware interfaces, hardware prototype design and development.

PUBLICATIONS:

Alec Rivers, Andrew Adams, and Frédo Durand. Sculpting by Numbers. In *Proceedings of ACM SIGGRAPH Asia 2012*.

Alec Rivers, Ilan E. Moyer, and Frédo Durand. Position-Correcting Tools for 2D Digital Fabrication. In *Proceedings of ACM SIGGRAPH 2012*.

Alec Rivers, Takeo Igarashi, and Frédo Durand. 2.5D Cartoon Models. In *Proceedings of ACM SIGGRAPH 2010*.

Alec Rivers, Frédo Durand, and Takeo Igarashi. 3D Modeling with Silhouettes. In *Proceedings of ACM SIGGRAPH 2010.*

Alec Rivers and Doug James. FastLSM: Fast Lattice Shape Matching for Robust Real-time Deformation. In *Proceedings of ACM SIGGRAPH 2007.*

PROFESSIONAL EXPERIENCE:

2013 – Present   Co-founder   **Shaper Tools, Inc.**
Working on commercializing augmented manual fabrication technology. Developing a real-time computer vision / image processing application running in embedded Linux to drive a custom handheld power tool that allows users to effortlessly cut complex 2D shapes out of wood, plastic, and sheet metal. The original technology behind the tool is the culmination of many years' development, was the subject of my PhD thesis, and has been featured in the New York Times among other outlets (see below).

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Sep. 2008 – 2013	PhD student	**Massachusetts Institute of Technology**

Advised by Professor Frédo Durand. Research focused on digital fabrication technologies and computer graphics.

July – Aug. 2009	Visiting researcher	**CG & CAD Lab, Tsinghua University, China**

Continued research in computer graphics in the lab of Professor Bin Wang. Independently studied Mandarin Chinese.

July – Aug. 2008	Visiting researcher	**Media Research Lab, New York University**

Pursued independent research with advice from several MRL professors.

Feb. – June 2008	Computer science teacher	**Stuyvesant High School, New York, NY**

Full-time teaching position, spring semester.

June – Nov. 2007	Visiting researcher	**Igarashi User Interface Laboratory, The University of Tokyo, Japan**

Researchied user interaction and computer graphics under the supervision of Professor Takeo Igarashi.

2004 – 2007	Undergraduate researcher	**Cornell University, Ithaca, NY**

Worked independently and later with Professor Doug James researching new algorithms for physically based modeling; developed a new approach (FastLSM) significantly faster than previous methods.

Fall 2006	Researcher	**Cornell Natural Language Processing Group**

Worked under Professor Claire Cardie in the eRulemaking project on new document classification algorithms that can classify on the sentence level.

Summer 2005	Programming intern	**Electronic Arts, Tiburon Studio, Florida**

Worked in a team developing a new EA-wide library that connects Flash and C++ and drives the GUIs for EA's next generation games.

Spring 2005	Programmer / designer	**Cornell Theory Center, SciCentr project**

Developed a new bot management system for Cornell's online "virtual science museum".

Summer 2004	Asst. wargames designer	**U.S. Air Force Research Lab, Rome, NY**

Designed and implemented new AI system for a military wargame.

MEDIA:

"Sculpting by Numbers Lets You Pass for Michelangelo", New Scientist TV, 10/2012.

"For the Home Workshop, a GPS for Power Tools", New York Times, 9/2012. See: http://www.nytimes.com/2012/09/23/technology/computer-precision-for-power-tools-novelties.html

"New Router Enhances the Precision of Woodworking", MIT News (spotlight story), 8/2012. See: http://web.mit.edu/newsoffice/2012/automated-handheld-router-for-woodworking-0808.html

"Handheld Cutting Tool Makes Anyone a Master Carpenter", NBC News Digital, 8/2012.

AWARDS:

NSF Graduate Research Fellowship, 2010-2013.

MathWorks fellowship, 2008-2009

Finalist in Eurographics Graphics Meets Games competition, 2006

PERSONAL PROJECTS:

List of projects, demos and screenshots available at www.alecrivers.com

- Created several computer games and accompanying physics simulation engines, most aimed at integrating deformable object modeling into computer games.

- Studied Russian language to advanced level, French to intermediate level, and Mandarin Chinese to intermediate level.