Jarrell Waggoner

Biographical

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Online

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Interests computer vision, image processing, artificial intelligence, pattern recognition & machine learning, data science, functional programming, web development, Clojure

Education

Aug. 2013	**Ph.D.**	Computer Science & Engineering	**University of South Carolina**
May 2009	**M.E.**	Computer Science & Engineering	**University of South Carolina**

Experience

2013—Present
Software Development Engineer III at Groupon, Inc.
Member of the Quantum Lead team building internal tools for Groupon's sales workforce using **Clojure** to develop service-oriented and big data systems. Built a specialized caching system, rearchitected existing **Hadoop** pipeline in **Cascalog**, and scaled a session management system used by a large machine-learning data pipeline.

2012—2014
Technical Lead at Terrastride, Inc.
Software developer in an agile startup environment creating the huntstand.com web application. Written using **Python**, **Django**, and **Backbone.js**; deployed to **AWS**. Responsible for curating full technology stack and coordinating with 5 developers.

2011—2013
Research Assistant at USC Computer Vision Lab
Dissertation research on computer vision models and algorithms for materials science image segmentation in **Python**, **NumPy**, **SciPy**, **OpenCV**, and **MATLAB**. Created a web interface using **Django**, **JavaScript**, and **jQuery**. Conducted large-scale analysis using a 98-core high-performance computing system.

2010—2011
Research Assistant for the DARPA Mind's Eye Program
Researched video event recognition for the DARPA Mind's Eye program. Collaborated with 10 students and faculty members across three institutions. Developed algorithms in **Scheme**, **Bash**, **MATLAB**, and **C** to process a corpus of 3480 videos extracted into over 1.5 million frames. Distributed processing over 7 HPC machines. 0xab.com/research/video-in-sentences-out.html , github.com/malloc47/video-in-sentences-out

2009—2010
NEH Fellow at the USC Center for Digital Humanities (Sapheos/Paragon Project)
Developed the prototype for a *digital collation* application to identify sub-textual inconsistencies among multiple copies of *The Faerie Queene* by Edmund Spenser. Created in **MATLAB** using **VLFeat** and **OpenCV** to process tens of thousands of book page images. github.com/malloc47/digital-collation

2007—2011
Teaching Assistant for USC Department of Computer Science and Engineering
Taught classes in software development, web development, and computer engineering, covering **Java**, **JavaScript**, **HTML/CSS**, and **Visual Basic**. Created syllabi and course objectives, developed and graded projects and assignments, supervised labs, and tutored students.

Skills & Languages

• • • Bash	• • git	• • JavaScript	• • • Python
• • • C/C++	• • • GNU/Linux	• • LaTeX	• • Django
• Cascalog	• • Hadoop	• • • MATLAB	• • • Scheme
• • • Clojure	• Haskell	• • • NumPy/SciPy	• • SQL
• • Emacs Lisp	• • • Java	• • • OpenCV	

• Small-scale projects and/or assignments • • Multiple projects and/or experience teaching • • • Large-scale and/or production systems

Personal and Open Source Projects

MATSCISEG	Framework for propagated 3D volume segmentation, used in my dissertation work. Algorithms created in **Python** and **C++** and exposed as a web API using **Django**. Includes a web application that consumes the API created in **JavaScript**, and **jQuery**. github.com/malloc47/matsciseg
NONPARTISAN.ME	Google Chrome extension that filters social media websites for political keywords. Available in the Chrome Web Store. Featured in the Charleston City Paper. github.com/malloc47/nonpartisan.me
TERM-DO	An interactive terminal prompt that displays potential command completions as you type. A hybrid of gnome-do and Emacs's ido-mode. Works on many tested VT100 terminal types; built in **C++**. Includes client/server architecture implemented with boost.interprocess and full-featured plugin system. Available in the Arch Linux AUR. github.com/malloc47/term-do

Selected Publications

[1] **Jarrell Waggoner**, Youjie Zhou, Jeff Simmons, Marc De Graef, and Song Wang. Graph-cut based interactive segmentation of 3D materials-science images. *Machine Vision and Applications*, 25:1615–1629, 2014.

[2] Youjie Zhou, Lili Ju, Yu Cao, **Jarrell Waggoner**, Yuewei Lin, Jeff Simmons, and Song Wang. Edge-weighted centroid voronoi tessellation with propagation of consistency constraint for 3D grain segmentation in microscopic superalloy images. In *CVPR Workshop on Perception Beyond the Visible Spectrum (PBVS)*, 2014.

[3] **Jarrell Waggoner**. *Multi-Label Segmentation Propagation for Materials Science Images Incorporating Topology and Interactivity*. Dissertation, University of South Carolina, 2013.

[4] **Jarrell Waggoner**, Jeff Simmons, Marc De Graef, and Song Wang. 3D materials image segmentation by 2D propagation: A graph-cut approach considering homomorphism. *IEEE Transactions on Image Processing*, 22, 2013.

[5] **Jarrell Waggoner**, Youjie Zhou, Jeff Simmons, Ayman Salem, Marc De Graef, and Song Wang. Interactive grain image segmentation using graph cut algorithms. In *Proceedings of SPIE (Computational Imaging XI)*, Burlingame, CA, 2013.

[6] Andrei Barbu, Alexander Bridge, Zachary Burchill, Dan Coroian, Sven Dickinson, Sanja Fidler, Aaron Michaux, Sam Mussman, Siddharth Narayanaswamy, Dhaval Salvi, Lara Schmidt, Jiangnan Shangguan, Jeffrey Mark Siskind, **Jarrell Waggoner**, Song Wang, Jinlian Wei, Yifan Yin, and Zhiqi Zhang. Video in sentences out. In *Conference on Uncertainty in Artificial Intelligence*, pages 102–112, 2012.

[7] **Jarrell Waggoner**, Jeff Simmons, and Song Wang. Combining global labeling and local relabeling for metallic image segmentation. In *Proceedings of SPIE (Computational Imaging X)*, volume 8296, Burlingame, CA, 2012.

[8] Zhiqi Zhang, Sanja Fidler, **Jarrell Waggoner**, Yu Cao, Sven Dickinson, Jeffrey Mark Siskind, and Song Wang. Superedge grouping for object localization by combining appearance and shape information. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 3266–3273, Providence, RI, 2012.

[9] Andrew Temlyakov, Brent C. Munsell, **Jarrell Waggoner**, and Song Wang. Two perceptually motivated strategies for shape classification. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 2289–2296, 2010.

[10] Zhiqi Zhang, Yu Cao, Dhaval Salvi, Kenton Oliver, **Jarrell Waggoner**, and Song Wang. Free-shape subwindow search for object localization. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 1086–1093, 2010.

Recent Talks

[1] Python for Computer Vision. *All Things Open*. Raleigh, SC. October 24, 2013.

[2] Extending Django. *Palmetto Open Source Software Conference*. Columbia, SC. March 28, 2013.

[3] Computer Science: Research, Industry, and Entrepreneurship. *Careers in Science Lecture Series*. Lancaster, SC. March 6, 2013.

[4] Interactive Grain Image Segmentation Using Graph Cut Algorithms. *SPIE (Computational Imaging XI)*. Burlingame, CA. February 6, 2013.

[5] Android Application Development Workshop. *Appathon Contest*. Columbia, SC. Nov. 17, 2012.

[6] Open Source and Education. *SC Municipal Technology Association (SCMTA) Conference*. Charleston, SC. Sep. 6, 2012.

[7] Introduction to Android Development. *Digital Humanities High Performance Computing (DHHPC) Workshop*. Columbia, SC. Aug. 8, 2012.

[8] Combining Global Labeling and Local Relabeling for Metallic Image Segmentation. *SPIE (Computational Imaging X)*. Jan. 23, 2012.

[9] Open Source and Government. *SC Government Management Information Systems (SCGMIS) Workshop*. Columbia, SC. Jan. 19, 2012.

Honors/Awards at USC

2012	Gamecock Computing Research Symposium Poster Session, First Place	2004	Clara P. Hammond Award
2012	Graduate Student Day Presentation, First Place	2004	Science and Mathematics Award
2009	Upsilon Pi Epsilon	2004	Highest Academic Average Award

Activities

teaching, programming, open source software, system administration, data visualization, Linux, music composition