Jarrell Waggoner

Biographical

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Online

Website	www.malloc47.com
Twitter	@malloc47
github	github.com/malloc47
LinkedIn	linkedin.com/in/malloc47

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 at Groupon, Inc.

Tech Lead of the Supply Intelligence team building internal tools and analytics pipelines to optimize Groupon's supply funnel using **Clojure** to develop service-oriented and big data systems.

— Built a high-performance caching and write management system around **Salesforce** that hits 10K req/min
— Managed a critical business automation of the sales lead assignment process that previously required an estimated 80 managers to conduct manually; led the effort to rearchitect this legacy system from an ad-hoc job scheduling platform written in **Ruby** and **Bash** to a multi-staged **Hadoop** pipeline written in **Clojure**
— Developed logic and coordinated with product and business teams to inject 250K leads into **Salesforce** from scraped web data
— Built out an ETL and machine learning platform using **Python** and **Spark**

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

Skills & Languages

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

• 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
BEFUNGE.PY	Complete Befunge interpreter written in **Python**. Implements the Befunge 93 specification, and is one of the closest Python equivalents to the **C** reference implementation. github.com/malloc47/befunge.py

Selected Publications

[1] **Jarrell Waggoner**, Youjie Zhou, Jeff Simmons, Marc De Graef, and Song Wang. Topology-preserving multi-label image segmentation. In *IEEE Workshop on Applications of Computer Vision (WACV)*, pages 1084–1091, Waikoloa Beach, HI, 2015. [PDF].

[2] **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. [PDF].

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

[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. [PDF].

[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. [PDF].

[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. [PDF].

[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. [PDF].

[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. [PDF].

[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. [PDF].

[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, San Francisco, CA, 2010. [PDF].

Recent Talks

[1] Rules Engines: Logic As Data Structure. *Palmetto Open Source Software Conference.* Columbia, SC. April 14, 2015.

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

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

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

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

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

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

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

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

[10] 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