

TYLER MCDONNELL

Artificial Intelligence & Crowdsourcing Researcher
Embedded Systems Engineer

<http://tylermcdonnell.com>
tmcdonnell@utexas.edu

INTERESTS

Machine Learning
Natural Language Processing
Reinforcement Learning
Data Science

Information Retrieval
Human-Computer Interaction
Embedded Systems
Public Policy & Artificial Intelligence

EDUCATION

Ph.D IN PROGRESS	Computer Science <i>Artificial Intelligence & Crowdsourcing</i> University of Texas at Austin Advisor: Matthew Lease
M.S. EXPECTED 2017	Computer Science <i>Artificial Intelligence & Crowdsourcing</i> University of Texas at Austin Advisor: Matthew Lease
B.S. 2013	Computer Engineering <i>Computer Architecture & Embedded Systems</i> University of Texas at Austin Advisor: Miryung Kim Thesis: "A Study of API Evolution in Mobile Ecosystems"

ACADEMIC EXPERIENCE

Research Assistant 2016-PRESENT	<i>IR & Crowdsourcing Lab</i> , University of Texas at Austin Developing scalable, crowd-based (e.g., Amazon Mechanical Turk) evaluation methodologies for search engines that incorporate innovative design, supervised learning, and reinforcement learning.
Research Assistant 2013	<i>Software Evolution Lab</i> , University of Texas at Austin Characterized development trends in mobile ecosystems. Developed extensive Java and Git lexical analysis tools to comb histories of open source mobile applications on popular platforms such as Github to yield insights related to API adoption, including correlations with factors like bug introduction.
Engineering Tutor 2011-2012	<i>Equal Opportunity in Engineering Program</i> , University of Texas at Austin Tutored students from underrepresented backgrounds in core engineering courses.
Research Fellow 2010	<i>Center for Chemical Innovation</i> , University of Texas at Austin Budgeted, conducted, and presented research relating to affordable photovoltaics built using a special class of organic materials, oligothiophenes. My research focused on characterizing different crystal growth methods and their electrical properties.

PROFESSIONAL EXPERIENCE

Founder 2016-PRESENT	Ororo Design, Austin, TX Founded a company focused on providing web design, search engine optimization, and social media support for small and personal businesses.
Contract Engineer 2016	Ketra, Austin, TX Prototyped a regression model for evaluating and improving customer network topologies using Ketra IoT devices. Established a simple, localized internal logging and customer-facing error scheme for primary consumer software. Primary Technologies: Embedded C, C#, C++, ARM Cortex M-3
Engineer 2013-2015	Ketra, Austin, TX One of the earliest engineers at the LED lighting start-up. Designed the embedded file system used across company product portfolio. Spearheaded wireless R&D leading to 5x increase in stable network size and simplified UX. Supervised pilot product installations and rapid feature prototyping for award-winning S38 lamp. Front-end development of primary customer-facing software. Primary Technologies: Embedded C, C#, C++, ARM Cortex M-3
Engineer 2013	Azul (now TasteBud), Austin, TX Designed regression models for user-client affinity for a "reverse-bidding" mobile application start-up. Primary Technologies: Python, scikit-learn
Engineering Intern 2012	Intel, Austin, TX Built tools and infrastructure used to identify and resolve hundreds of bugs in top priority first generation Intel system-on-a-chips. Primary Technologies: Python, Java, Android, proprietary scripting languages

PUBLICATIONS

1. T. McDonnell, M. Kutlu, T. Elsayed, and M. Lease. "Beyond Dual Supervision: the Many Benefits of Annotator Rationales for Relevance Judgments". *In Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI): Sister Conference Best Paper Track*, 2017.
2. Y. Zhang, M. Rahman, A. Braylan, B. Dang, H. Chang, H. Kim, Q. McNamara, A. Angert, E. Banner, V. Khetan, T. McDonnell, A. Nguyen, D. Xu, B. Wallace, M. Lease. "Neural Information Retrieval: A Literature Review". (pre-print), 2016.
3. T. McDonnell, M. Lease, M. Kutlu, T. Elsayed. "Why Is That Relevant? Collecting Annotator Rationales for Relevance Judgments", *In Proceedings of the 4th AAAI Conference on Human Computation and Crowdsourcing (HCOMP)*, 2016. **Best Paper Award**.
4. T. McDonnell, B. Ray, and M. Kim. "An Empirical Study of API Stability and Adoption in the Android Ecosystem", *In Proceedings of the 29th IEEE International Conference on Software Maintenance (ICSM)*, 2013.

OTHER WRITING

1. T. McDonnell, M. Lease, M. Kutli, T. Elsayed. "Why Is That Relevant? Collecting Annotator Rationales for Relevance Judgments". *Follow The Crowd*, blog post, 2016.

PRESENTATIONS

1. *Why Is That Relevant: Collecting Annotator Rationales for Relevance Judgments*
4th AAAI Conference on Human Computation and Crowdsourcing, Austin, TX, October 2016.

2. *API Evolution in Mobile Applications*
Engineering Symposium, Austin, TX, February 2012.
 3. *Crystal Growth and Analysis of Select Oligothiophenes*
CCI Conference on Nanomaterials, Austin, TX, August 2010.
-

HONORS AND AWARDS

Graduate School Mentoring Fellowship 2015
Equal Opportunity in Engineering High Honor Roll 2013
Equal Opportunity in Engineering High Honor Roll 2012
Louis T. and Jewell K. Pirkey Endowed Scholarship 2012
William E. Douglas Endowed Presidential Scholarship 2012
Google FUSE Leadership Scholarship 2011
Alma and Leonard Orth Endowed Scholarship 2010
SHPE Hispanic Scholar
Cockrell Engineering Honors Program 2009-2013
Cockrell College Scholar 2009-2013
University Honors 2009-2013
Houston Livestock Show and Rodeo Metropolitan Scholarship 2009-2012
Hispanic Heritage Youth Leadership Award 2009
National Merit Hispanic Scholar 2009

SERVICE AND AFFILIATIONS

Article Reviewer, ACM Transactions on Computer-Human Interaction (TOCHI) 2016
Reviewer, 4th AAAI Conference on Human Computation and Crowdsourcing (HCOMP) 2016
Review Committee, National Center for Women & Information Technology Awards 2016
Review Committee, National Center for Women & Information Technology Awards 2015
President, UT Chapter of the Texas Society of Professional Engineers 2012-2013
VP External, UT Chapter of the Texas Society of Professional Engineers 2011
Cockrell Student Leadership Awards Committee, UT Austin 2012
Cockrell Student Leadership Awards Committee, UT Austin 2011
Publicity Committee Chair, Student Engineering Council at UT Austin 2011
Participant, LeaderShape Texas 2011
Review Committee, National Center for Women & Information Technology Awards 2011
Review Committee, National Center for Women & Information Technology Awards 2010
Council Representative, National Association of Engineering Student Councils 2010
Phi Eta Sigma Honor Society

PROJECT SUMMARY

2016	<i>Multi-Task Deep Representation Learning</i> Investigation of shared-layer deep architectures for learning across multiple tasks of variable relatedness or under sparse data constraints.
2016	<i>Crowdsourcing Relevance Judgments Using Reinforcement Learning</i> Exploration of reinforcement learning methods for improving the cost-efficiency of crowd-based IR system evaluation. Defines a state space over actions taken by crowd requesters and discriminating features of crowd worker products and task instances.
2016	<i>Synonymy & Antonymy Detection in Distributional Models</i> Supervised and unsupervised models for resolving synonymy and antonymy in co-occurrence word embeddings using broad-context sentimental polarity features.
2015	<i>Paxos-Based Chat Client</i> A distributed, fault-tolerant chat service built using the multi-degree Paxos algorithm for state machine replication.

- 2013 | *Graduate Admissions Support Program*
Regression models and visualization tools for evaluating candidates to the University of Texas at Austin Electrical & Computer Engineering Department.
- 2013 | *Automatic Segmentation of Electron Micrograph Images*
A pipeline for building 3D models of neurons from high-resolution cross-sectional electron micrograph images using image pre-processing filters and random forests.
- 2012 | *LC3-b CPU Emulator*
Instruction-level and cycle-level accurate simulator of the LC-3b processor architecture, with modifications supporting pipelining, virtual memory, and exceptions.

1.1.2017