Alex C. Williams

Computer Science, Ph.D Student

David R. Cheriton
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Research Statement

My research focuses on understanding how social and behavioral aspects of intelligent pedagogical agents can be operationalized to motivate and sustain public participation in citizen science.

Areas: Human computation, crowdsourcing, human-computer interaction, citizen science, crowd-supported cooperative work, intelligent user interfaces, artificial intelligence.

Education

University of Waterloo, 2020 (expected) — *GPA*
Doctor of Philosophy, Computer Science — *92.0/100.0*
Supervisors: Edith Law, Ed Lank

Middle Tennessee State University, 2015
Master of Science, Computer Science — *4.0/4.0*
Thesis: *Computationally Accelerated Papyrology*
Supervisors: Hyrum Carroll, John Wallin

Middle Tennessee State University, 2013
Bachelor of Science, Computer Science — *3.3/4.0 (Major: 3.5/4.0)*

Research experience

University of Waterloo, Waterloo, ON — 09/15 – present
Graduate Research Assistant, School of Computer Science

Middle Tennessee State University, Murfreesboro, TN — 05/15 – 01/16
Research Software Engineer, Center for Computational Science

University of Oxford, Oxford, UK — 06/14 – 03/15
Research Scientist, Faculty of Classics

Oak Ridge National Laboratory, Oak Ridge, TN — 06/13 – 08/13
Research Intern, Computational Sciences and Engineering Division

Oak Ridge National Laboratory, Oak Ridge, TN — 06/12 – 08/12
Research Intern, Computational Sciences and Engineering Division

Middle Tennessee State University, Murfreesboro, TN — 01/12 – 05/13
Research Assistant, Center for Computational Science

Teaching experience

University of Waterloo, Waterloo, ON — 09/15 – present
Graduate Teaching Assistant, School of Computer Science

- *Sessional Instructior*, CS349: User Interfaces (Winter 2016)
- *Instructional Apprentice*, CS349: User Interfaces (Fall 2016)
- *Teaching Assistant*, CS349: User Interfaces (Winter 2016; Spring 2016)
- *Teaching Assistant*, CS330: Information Management Systems (Fall 2015)

University of Victoria, Victoria, BC 06/16 – present
Workshop Instructor, Digital Humanities Summer Institute

- *Instructor*, Crowdsourcing as a Tool for Research and Public Engagement (Summer 2017)
- *Instructor*, Crowdsourcing as a Tool for Research and Public Engagement (Summer 2016)

Middle Tennessee State University, Murfreesboro, TN 08/13 – 05/15
Graduate Teaching Assistant, Department of Computer Science

- *Instructor*, CSCI 1150: Computer Science Orientation (Spring 2015)
- *Instructor*, CSCI 3130: Introduction to Computer Architecture (Fall 2013; Spring 2014)
- *Grader*, CSCI 3160: Introduction to Assembly Language (Fall 2013)

Middle Tennessee State University, Murfreesboro, TN 01/12 – 05/13
Computer Science Tutor, Department of Computer Science

Publications

Journal Papers

[1] Hyrum D. Carroll, **Alex C. Williams**, Anthony G. Davis, and John L. Spouge. Improving retrieval efficacy in homology search using the false discovery rate. *ACM/IEEE Transactions on Computional Biology and Bioinformatics*, 2014.

Refereed Conference and Workshop Papers

[2] Edith Law, Kryzysztof Z. Gajos, Andrea Wiggins, Mary L. Gray, and **Alex C. Williams**. Crowdsourcing as a Tool for Research : Implications of Uncertainty. *Proceedings of the 20th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 2017.(*In Press*)

[3] Timmy Tse, Justin Salamon, **Alex C. Williams**, Helga Jiang, and Edith Law. Ensemble: A Hybrid Human-Machine System for Generating Melody Scores from Audio. *Conference for the International Society for Music Information Retrieval*, 2016.

[4] **Alex C. Williams**, Annapaola Santarsiero, Chiara Meccariello, Gertjan Verhasselt, Hyrum D. Carroll, John F. Wallin, Dirk Obbink, and James H. Brusuelas. Proteus: A Platform for Born Digital Editions of Literary Papyri. *International Congress on Digital Cultural Heritage*, 2015.

[5] **Alex C. Williams**, John F. Wallin, Haoyu Yu, Marco Perale, Hyrum D. Carroll, Anne-Francoise Lamblin, Lucy Fortson, Dirk Obbink, Chris J. Lintott, and James H. Brusuelas. A Computational Pipeline for Crowdsourced Transcriptions of Ancient Greek Papyrus Fragments. *Proceedings of the 2nd Workshop on Big Humanities Data*, 2014.

[6] **Alex C. Williams**, Hyrum D. Carroll, John F. Wallin, James Bruseulas, Lucy Fortson, Anne-Francoise Lamblin, and Haoyu Yu. Identification of Ancient Greek Papyrus Fragments Using Genetic Sequence Alignment Algorithms. *Proceedings of the 1st Workshop on Digital Humanities and e-Science*, 2014.

[7] Hyrum D. Carroll, **Alex C. Williams**, Anthony G. Davis, and John L. Spouge. False Discovery Rate for Homology Searches. *Proceedings of the 8th Brazilian Symposium on Bioinformatics, pp 194-201*, 2013.

[8] **Alex C. Williams**, Austin Hitt, Sophie Viosin, and Georgia Tourassi. Automated Assessment of Bilateral Breast Volume Asymmetry as a Breast Cancer Biomarker during Mammographic Screening. *Proceedings of SPIE Medical Imaging*, 2013.

Position Papers

[9] **Alex C. Williams**, Josh Bradshaw, Mike Schaekermann, Timmy Tse, William Callaghan, and Edith Law. The Big Picture: Preserving Context in the Decomposition of Complex Expert Tasks. *ACM Conference on Human Factors in Computing: Workshop on Microproductivity*, 2016.

[10]Mike Schaekermann, Edith Law, **Alex C. Williams**, and William Callaghan. Resolvable vs. Irresolvable Ambiguity: A New Hybrid Framework for Dealing with Uncertain Ground Truth. *ACM Conference on Human Factors in Computing: Workshop on Human-Centered Machine Learning*, 2016.

Relevant Coursework

University of Waterloo	
Human-Computer Interaction	**Artificial Intelligence**
CS 889: Human-in-the-Loop Systems	CS 886: Trust and Online Social Networks
CS 889: Replication Studies	CS 886: Intelligent User Interfaces

Middle Tennessee State University	
Methods and Analysis	**Intelligent Computing Architecture**
CSCI 6620: Research Methods in Comp. Science	CSCI 4360: Intelligent Robot Systems
MATH 2050: Probability and Statistics	CSCI 5560: Advanced Web Technology
MATH 2010: Data Analysis	CSCI 6700: Software Architecture Research

Service

Session Chair. HCOMP 2015
Reviewer. CHI 2016, CHI 2017, Citizen Science Association 2017
President. MTSU Association for Computing Machinery Student Chapter 2012 – 2014
Member. ACM, IEEE, AAAI

Funding

Waterloo Citizen Science Laboratory: Infrastructure Project Funding (2016)
Co-authored with Edith Law. *$144,703 submitted to Canadian Foundation for Innovation*

Fragmentary Papyrus Identification Using Genetic Sequence Alignment Algorithms (2013)
Co-authored with Hyrum Carroll. *$7,800 awarded via Middle Tennessee State University FRCAC Grant*

Honors and Awards

2016 – Vanier Graduate Scholarship – *Finalist*, Uni. of Waterloo ($50,000.00/year; *TBA: March 2017*)
2016 – CSST Summer Research Institute, *Selected Ph.D. Participant*
2015 – GO-Bell Scholarship, University of Waterloo ($10,000.00/year)
2015 – International Doctoral Student Award, University of Waterloo ($13,800.00/year)
2015 – Paul Hutcheson Outstanding Graduate Student Scholarship, MTSU ($500.00 to one student)
2013 – Chester and Mary Martin Graduate Scholarship, MTSU ($500.00)
2013 – *1st Place*, Deloitte's iOS and Android Mobile Application Design Competition ($3000.00)
2013 – *3rd Place*, MTSU ACM Programming Competition
2013 – *3rd Place*, MTSU Scholar's Week Poster Session
2008 - 2015 – MTSU Department of Computer Science Student Advisory Board

Miscellaneous

Languages: Native English Speaker
Citizenship: United States of America