Joseph Wonsil

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PhD student of computer science interested in interdisciplinary research and computational reproducibility.

Education

PhD Student **Vancouver, BC**
The University of British Columbia, *2021–Present*
Computer Science

Master's of Science **Vancouver, BC**
The University of British Columbia, *2019–2021*
Computer Science

Bachelor of Arts **Kenosha, WI**
Carthage College, *2015–2019*
Majoring in Computer Science, Environmental Science, Geospatial Science (GIS)

Teaching Experience

Tutor **Carthage College**
Geospatial Science and Computer Science *Feb 2016– May 2019*

- Assisted professors with teaching course material in-class.
- Held one-on-one sessions for students making up a missed class or requested clarification on in-class material.
- Held drop-in hours for homework and course-related questions.

Classes I tutored for:
- Intro GIS and Advanced GIS
- Computer Science I and II

Internships and Research Experience

Maestro Large-Scale Data Processing **Oracle Labs Machine Learning Research Group**
Provenance for a Large-scale Data Processing Pipeline *May 2023– August 2023*

- Internship project working on extending Maestro, a large-scale data processing pipeline.
- Integrated a provenance collection system into Maestro which can help identify where data originated, which transformations have been applied to it, and which execution of the pipeline is responsible for generating it.

Tribuo ML Library Reproducibility Framework **UBC Collaboration with Oracle Labs**
Contributing a reproducibility framework to the open-source Tribuo library *June 2021– October 2021*

- Built a framework to automatically recreate a pipeline capable of re-training an identical Tribuo model.
- Implemented a provenance diff tool to compare Tribuo provenance objects to help validate reproducibility.
- Published at ACM REP 2023

NSF Funded REU in Data Provenance **Harvard University**
Using Provenance to Make a Better Debugger *May 2018–Aug 2018*

- Worked closely with a research partner to create a provenance parser and post-mortem debugger for the R language.
- Used provenance to reconstruct past executions of scripts, reveal connections between variables, and type checking.
- Published in The R Journal

Spatio-Temporal Analysis of Blood Cancer in the US **Carthage College**
Geospatial Public Health Research *Jan 2018–Apr 2018*

- Analyzed blood cancer data to find patterns, hot spots, and possible correlations in occurrences in the US over the course of forty years.
- Taught myself the Python scripting language to automate analyses using a geographic information system.
- Poster presentation at American Association of Geographers Annual Meeting 2018.

○ **CaNOP CubeSat**   **Wisconsin Space Grant Consortium**
Multispectral imaging nanosatellite   *May 2016–May 2019*
- Wrote, submitted, and presented documentation to NASA.
- As Command and Data Handling Team Leader, worked with a team of diverse technical backgrounds to integrate the various components.
- Poster Presentation at American Society for Gravitational and Space Research 2017.
- Poster Presentation at CubeSat Developers Workshop 2018.

Service and Leadership

○ President of Computer Science Graduate Student Association, The University of British Columbia
○ Social Chair of Systopia Lab, The University of British Columbia
○ VP Social of Computer Science Graduate Student Association, The University of British Columbia
○ Documentation Chair of Systopia Lab, The University of British Columbia
○ Gold Leadership Award, Carthage College
○ Geography Department Service Fellowship, Carthage College
○ Computer Science Department Service Fellowship, Carthage College

Presentations and Posters

○ *Presentation*: **Wonsil, J.** (2023). *Provenance in a Large-scale Data Processing Pipeline.* Oracle Intern Presentations.
○ *Poster*: **Wonsil, J.**, Sullivan, J., Seltzer, M., & Pocock, A. (2023). *Integrated Reproducibility with Self-describing Machine Learning Models.* SALmon 2023 Workshop.
○ *Presentation*: **Wonsil, J.**, Sullivan, J., Seltzer, M., & Pocock, A. (2023). *Integrated Reproducibility with Self-describing Machine Learning Models.* ACM Conference on Reproducibility and Replicability 2023.
○ *Poster*: **Wonsil, J.** & Sun, W. (2019). *A Spatio-Temporal Visualization and Clustering Analysis of Leukemia and Lymphoma in the United States.* American Association of Geographers Annual Meeting 2019.
○ *Presentation*: **Wonsil, J.** (2018). *Using Provenance to Make a Better Debugger.* Harvard Forest Summer Student Symposium 2018.
○ *Poster*: **Wonsil, J.** & Sun, W. (2018). *A Spatio-Temporal Analysis of Leukemia and Lymphoma in the United States.* American Association of Geographers Annual Meeting 2018.
○ *Poster*: Crosby, K., Gallagher, C., Munson, J., & **Wonsil, J.** (2018). *Canopy Near-Infrared Observing Project.* 15th Annual CubeSat Developers Workshop.
○ *Poster*: Ananda, C., Baluch, S., Barnes, J., Bartel, N., Becher, M., Bisciglia, M., Dziubinski, K., Erickson, Z., Gallagher, C., Gerloff, D., Kitchen, C., Hernandez, M., Huff, M., Larson, J., Munson, J., Shannon, T., Weber, A., Wenner, N., & **Wonsil, J.** (2017) *Canopy Near-Infrared Observing Project.* Annual Meeting of the American Society for Gravitational and Space Research.

Publications

○ Boufford, N., **Wonsil, J.**, Pocock, A., Sullivan, J., Seltzer, M., & Pasquier, T. (Under Submission). *Computational Experiment Comprehension using Provenance Summarization.* Proceedings of the 2024 ACM Conference on Reproducibility and Replicability.
○ **Wonsil, J.**, Sullivan, J., Seltzer, M., & Pocock, A. (2023). *Integrated Reproducibility with Self-describing Machine Learning Models.* Proceedings of the 2023 ACM Conference on Reproducibility and Replicability, 1–14. https://doi.org/10.1145/3589806.3600039
○ **Wonsil, J.**, Boufford, N., Agrawal, P., Chen, C., Cui, T., Sivaram, A., & Seltzer, M. (2023). *Reproducibility as a service.* Software: Practice and Experience, 53(7), 1543–1571. https://doi.org/10.1002/spe.3202
○ Lerner, B., Boose, E., Brand, O., Ellison, A. M., Fong, E., Lau, M., Ngo, K., Pasquier, T., Perez, L. A., Seltzer, M., Sheehan, R., & **Wonsil, J.** (2023). *Making Provenance Work for You.* The R Journal, 14(4), 141–159.