

Logan Born

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Education

Doctor of Philosophy , Computing Science	Ongoing
Simon Fraser University, Burnaby, BC, Canada	
Cumulative GPA: 4.33 (on a 4.33 point scale)	
Senior Supervisor: Anoop Sarkar	
Master of Science , Computing Science	2018
Simon Fraser University, Burnaby, BC, Canada	
Cumulative GPA: 4.2 (on a 4.33 point scale)	
Senior Supervisor: Anoop Sarkar	
Thesis Title: <i>Properties of Prefix Lexicalized Synchronous Grammars</i>	
Bachelor of Science , Computer Science with Linguistics Minor	2016
University of Calgary, Calgary, AB, Canada	
Cumulative GPA: 3.985 (on a 4 point scale)	

Teaching and Research Interests

- I am interested in **interdisciplinary** work applying tools from **natural language processing** to **analyse and visualize corpora from the humanities** and social sciences, with a focus on **low-resource archaeological decipherment problems**.
- Secondary interests include **formal language theory** and **natural language syntax**.

Publications

- Kambhatla, Nishant, **Logan Born**, and Anoop Sarkar. 2023a. Learning nearest neighbour informed latent word embeddings to improve zero-shot machine translation. In *Proceedings of the 20th International Conference on Spoken Language Translation (IWSLT 2023)*. Toronto, Canada: Association for Computational Linguistics.
- Kambhatla, Nishant, **Logan Born**, and Anoop Sarkar. 2023b. Decipherment as regression: Solving historical substitution ciphers by learning symbol recurrence relations. In *Findings of the 17th Conference of the European Chapter of the Association for Computational Linguistics: EACL 2023 Findings*. Dubrovnik, Croatia: Association for Computational Linguistics.
- Kelley, Kathryn, **Logan Born**, M. Willis Monroe, and Anoop Sarkar. 2022a. On newly proposed proto-Elamite sign values. *Iranica Antiqua* 57.
- Kelley, Kathryn, **Logan Born**, M. Willis Monroe, and Anoop Sarkar. 2022b. Image-aware language modeling for proto-Elamite. In *Advanced Methodologies in the Decipherment of Ancient Writing Systems*, ed. Silvia Ferrara and Fabio

Tamburini, volume 2/2022 of *Lingue e linguaggio*. Bologna: Società editrice il Mulino.

- Logan Born**, M. Monroe, Kathryn Kelley, and Anoop Sarkar. 2022. Sequence models for document structure identification in an undeciphered script. In *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing*, 9111–9121. Abu Dhabi, United Arab Emirates: Association for Computational Linguistics. <https://aclanthology.org/2022.emnlp-main.620>.
- Kambhatla, Nishant, **Logan Born**, and Anoop Sarkar. 2022a. Auxiliary subword segmentations as related languages for low resource multilingual translation. In *Proceedings of the 23rd Annual Conference of the European Association for Machine Translation*. Online: Association for Computational Linguistics. <https://aclanthology.org/2022.eamt-1.16/>.
- Kambhatla, Nishant, **Logan Born**, and Anoop Sarkar. 2022b. CipherDAug: Ciphertext based data augmentation for neural machine translation. In *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics: Long Paper*. Online: Association for Computational Linguistics. <https://aclanthology.org/2022.acl-long.17/>.
- Logan Born**, Kathryn Kelley, M. Willis Monroe, and Anoop Sarkar. 2021. Compositionality of complex graphemes in the undeciphered proto-Elamite script using image and text embedding models. In *Findings of the Association for Computational Linguistics: ACL-IJCNLP 2021*, 4136–4146. Online: Association for Computational Linguistics. <https://aclanthology.org/2021.findings-acl.362>.
- Logan Born**, and Kathryn Kelley. 2021. A quantitative analysis of proto-cuneiform sign use in Archaic Tribute. *Cuneiform Digital Library Bulletin* 2021:6. https://web.archive.org/web/20220116225509/https://cdli.ucla.edu/pubs/cdlb/2021/cdlb2021_006.html.
- Logan Born**. 2018. Properties of prefix lexicalized synchronous grammars. Master's thesis, Simon Fraser University. <https://summit.sfu.ca/system/files/iritems1/19060/etd10760.pdf>.
- Logan Born**, Kate Kelley, Nishant Kambhatla, Carolyn Chen, and Anoop Sarkar. 2019. Sign clustering and topic extraction in proto-Elamite. In *Proceedings of the 3rd Joint SIGHUM Workshop on Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature*, 122–132. Minneapolis, USA: Association for Computational Linguistics. <https://www.aclweb.org/anthology/W19-2516>.
- Logan Born**, and Anoop Sarkar. 2018. Prefix lexicalization of synchronous CFGs using synchronous TAG. In *Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, 1160–1170. Association for Computational Linguistics. <http://aclweb.org/anthology/P18-1107>.
- Han, Chung-hye, Sara Williamson, **Logan Born**, and Anoop Sarkar. 2018. An analysis of clausal coordination using synchronous tree adjoining grammar. *Journal of Logic and Computation* 29(1):91–123. <http://dx.doi.org/10.1093/logcom/exy031>.

Other Presentations

Logan Born, M. Willis Monroe, Kathryn Kelley, and Anoop Sarkar. 2022. From signs to numbers: Towards richer encodings of ancient text. Talk presented at *History in Ones and Zeroes – The Challenges Involved in Coding the Past*, Vancouver, Canada.

Logan Born, M. Willis Monroe, Kathryn Kelley, and Anoop Sarkar. 2021. Compositionality of complex graphemes in the undeciphered proto-Elamite script using image and text embedding models. Poster presented at the *6th Workshop on Representation Learning for NLP (Repl4NLP)*, Online.

Wang, Chenhao, Philip Cho, **Logan Born**, Zhuo Cen, and Yijing Xue. 2019. Taxi demand prediction for regions with sparse demand. Poster presented at the 1st BC AI Student Showcase, Vancouver, Canada.

Logan Born, and Anoop Sarkar. 2018. A weight-preserving lexicalization for weighted synchronous context-free grammars. Talk presented at the 9th International Workshop on Weighted Automata: Theory and Applications (WATA 2018), Leipzig, Germany.

Han, Chung-hye, and Anoop Sarkar. 2017. Coordination in TAG without the conjoin operation. **Talk presented on behalf of Anoop Sarkar** at the 13th International Workshop on Tree-Adjoining Grammar and Related Formalisms, Umeå, Sweden.

Teaching Experience

Invited Lectures

IT Solutions for Collections Management Simon Fraser University, 2019
ARKY 349 – Management of Archaeological Collections

Teaching Assistant, Simon Fraser University

CMPT 120: Introduction to Computing Science and Programming I	Fall 2017, Fall 2022
CMPT 379: Principles of Compiler Design	Fall 2021
CMPT 353: Computational Data Science	Fall 2019
CMPT 225: Data Structures and Programming	Fall 2019
CMPT 127: Computing Laboratory	Summer 2018
CMPT 225: Data Structures and Programming	Fall 2017
CMPT 383: Comparative Programming Languages	Summer 2017

Selected Research Experience

Data Exploration for Undeciphered Ancient Near Eastern Scripts Ongoing
With an interdisciplinary team of archaeologists and computer scientists, performed the first-ever large-scale computational analysis of the undeciphered proto-Elamite script.

Writing Well is Hard 2022
Collaborated with academics and professionals in the editing industry to develop a suite of visualizations to facilitate editing academic writing (www.writingwellishard.com).

Google Summer of Code 2020

2020

Interned with the Cuneiform Digital Library Initiative to develop tools for processing numeric notations in ancient scripts, and created novel exploratory visualizations for ancient accounting corpora.

Simon Fraser University Tree-Adjoining Grammars Reading Group

2016–2017

As part of an interdisciplinary linguistics/computer science reading group, helped develop a novel approach to sentence coordination which is less computationally complex than prior approaches.

Formal Properties of Tree Tuple Multi-Component Tree Adjoining Grammars

2015

Investigated whether all tree-tuple multicomponent tree adjoining languages are semilinear, and searched for normal forms and pumping algorithms for these languages.

Research Grants

NSERC Canada Graduate Scholarship-Doctoral (CGS-D)

2020–2023

Awarded by the National Science and Engineering Research Council of Canada (NSERC)

NSERC Canada Graduate Scholarship-Master's (CGS-M)

2016

Awarded by the National Science and Engineering Research Council of Canada (NSERC)

NSERC Undergraduate Student Research Award (USRA)

2015

Awarded by the National Science and Engineering Research Council of Canada (NSERC)

Volunteer Experience

Simon Fraser Museum of Archaeology and Ethnology

Research Associate

2019–2020

Archive Digitization and Cataloguing

2017–2018

Scribe and Muse English Club

Peer Revising (reviewing and editing assistance)

2015–2016

Language Competence

English (native), **French** (reading and writing), **German, Italian, Japanese** (reading only)