

# Logan Born

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## Education

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<b>Doctor of Philosophy</b> , Computing Science	Ongoing
Simon Fraser University, Burnaby, BC, Canada	
Cumulative GPA: 4.33 (on a 4.33 point scale)	
Senior Supervisor: Anoop Sarkar	
<b>Master of Science</b> , 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>	
<b>Bachelor of Science</b> , 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

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- 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**.
- Secondary interests include formal language theory and natural language syntax.

## Publications

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- Kambhatla, Nishant, **Logan Born**, and Anoop Sarkar. 2023. 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](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

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- 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

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### 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

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**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, which has independently replicated and expanded on results from historic manual analyses.

**Writing Well is Hard** 2022  
 Collaborated with academics and professionals in the editing industry to develop a suite of visualizations that facilitate the editing of academic writing ([www.writingwellishard.com](http://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 this class of languages.

**Research Grants**

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**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)

**Selected Honours and Awards**

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SFU Computing Science Graduate Fellowship

2016, 2020, 2021, 2022

University of Calgary Undergraduate Merit Award

2015

President's Admission Scholarship, University of Calgary

2012

Governor General's Academic Medal (Bronze)

2012

**Volunteer Experience**

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**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**

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