

# Kyle Roth

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## INTRODUCTION

Kyle Roth is a first-year PhD candidate in the Département d'informatique et de recherche opérationnelle (DIRO) at the Université de Montréal. He is advised by Bang Liu. His research interests revolve around natural language processing: procedural knowledge understanding, worst-group generalization, multimodal and embodied learning, and AI alignment.

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## EDUCATION

### Doctor of Philosophy (Ph.D.)

*Dept. d'informatique et de rech. opér., Université de Montréal*

- **3.7 GPA**; accelerated admission in fall 2022 from M.Sc. (**4.3 GPA**)

**Sep 2021 -**  
*Montréal, Canada*

### Bachelor of Science (B.S.)

*Department of Mathematics, Brigham Young University*

- Applied and Computational Mathematics Emphasis (ACME)
- **3.9 GPA** (Cum Laude); minor in computer science; concentration in linguistics

**Aug 2014 - Dec 2019**  
*Provo, USA*

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## WORK EXPERIENCE

### Cobalt Speech and Language

*speech scientist (full time)*

- Built an online training service in Go to manage parallel training of Kaldi models on sensitive live data
- Implemented state-of-the-art hyperparameter selection algorithms (learning rate range test; adaptive filtering) for online training
- Implemented MFCC extraction in Go while avoiding allocs and array bound checks

**Jan 2020 - Aug 2021**  
*(remote) Provo, USA*

### Emergent Trading

*software developer (intern)*

- Wrote fast market analysis code in C++ to track competitors on currency markets at the Chicago Mercantile Exchange
- Designed and built an interactive tool to observe trades and prices in Brazilian currency futures using the Bokeh Python library

**May 2019 - Aug 2019**  
*Chicago, USA*

### CamachoLab, Brigham Young University

*research assistant (part time)*

- Simulated field profiles of photonic chip components in TensorFlow using neural networks with resize convolutions
- Built SLURM\_gen, a tool to automatically generate and manage simulated datasets in a high-performance computing environment
- Wrote custom resize-convolution layer to improve performance

**Jan 2019 - Dec 2019**  
*Provo, USA*

### Cobalt Speech and Language

*speech scientist (intern)*

- Improved model accuracy from 76% to 94% for autonomous drone recognition of air traffic control speech, using class-based (Thrax) language models

**Apr 2018 - Nov 2018**  
*(remote) Provo, USA*

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## HONORS & AWARDS

- Université de Montréal bourse d'exemption, 3e cycle (42,076.26 CAD)
- Université de Montréal bourse d'exemption, 2e cycle (9,789.06 CAD)

*Aug 2022 - Aug 2024*

*Aug 2021 - Aug 2022*

- Brigham Young University Mathematics Department certificate of excellence *Apr 2018*
  - North Idaho College mathematics student of the year *May 2014*
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## PUBLICATIONS

**Kyle Roth**, Deryle Lonsdale. "Morphological Parsing and Segmentation." *BYU Journal of Undergraduate Research* (2019): 24280. <http://jur.byu.edu/?p=24280>

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## RESEARCH GRANTS

**Mitacs Accelerate** *Aug 2022 - Apr 2023*  
*20,000 CAD. Principal research intern.*

- Project title: Technical and procedural knowledge extraction with question answering.
- Partner organization: Thales Canada Inc.

**BYU ORCA undergraduate research grant** *Jan 2018 - Dec 2018*  
*1,500 USD. Individual mentored research project.*

- Project title: Morphological parsing and segmentation.
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## TEACHING & SERVICE

**teaching assistant** *Jan 2023 - May 2023*  
*Université de Montréal; IFT 6759: advanced machine learning projects*

- Taught introductory lectures on Linux, Git, and other development tooling

### reviewer

- 2023 - AAAI, CVPR, WWW, ACL ARR, Elsevier Pattern Recognition
- 2022 - Elsevier Knowledge-Based Systems

**math lab tutor** *Aug 2013 - May 2014*  
*North Idaho College; calculus I, II, III, & differential equations*

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## SKILLS

- **natural languages:** native English, fluent Spanish, basic French
- **programming languages:** Python, Go, C++, Java, Dart, Bash,  $\text{\LaTeX}$
- **tools:** PyTorch, TensorFlow, SLURM, Kaldi, git, scikit-learn, NumPy, Pandas, AWS, SQL, PySpark