

# Hugo Hudson

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## Work Experience

### Tripathy Lab, Krembil Centre for Neuroinformatics

September 2024 - Present

*Student Trainee*

*Toronto, ON*

- Implemented RNA-seq & DNA Methylation deconvolution algorithms.
- Worked individually in computing & optimizing cell specific epigenetic age profiles for 20 brain cell types.
- Currently, building pipelines for spatial transcriptomic data.

### Sanofi's AI Centre of Excellence

June 2024 - September 2024

*Computational Science Intern (under NDA)*

*Toronto, ON*

- Implemented knowledge graph structures to model drug-molecule & molecule-molecule interactions.
- Developed interpretable graph embedding models for molecular interaction networks.
- Utilized graph based query languages for decreased computational run time.
- Improved quantification of proprietary systems for novel molecular pathways.

### Owkin

June 2023

*Data Science Intern*

*Paris, France*

- Implemented supervised machine learning algorithms to classify cancer type based on gene expression in patients.
- Investigated Prostate Adenocarcinoma cancer subtypes using unsupervised machine learning and clustering.
- Enhanced cancer classification model by changing from machine learning algorithms to using a deep learning neural network.

## Education

### University of Toronto

September 2022 - June 2026

*Bachelor of Science in Cell & Molecular Biology and Genome Biology*

*Toronto, ON*

- Biology coursework in cell-cell interactions, cellular migration, extracellular matrix dynamics, eukaryotic gene expression, genetics and stem cells for regenerative medicine.
- Computer Science coursework in software tools, design and programming.
- Mathematics course work in linear algebra, combinatorics, single and multivariable calculus.

## Projects

### Desktop Application for Music Reviewing | Java, Amazon Web Services, Springboot

- Built & deployed a back-end server with an AWS EC2 instance for storage of user information.
- Developed a custom API for communication with the remote server.
- Designed a profile interface that allows users to interact with each other within the application.

### AI Based Image Recognition | Python, Tensorflow

- Implemented a convolution neural network and tuned it for brain tumor MRI classification.
- Accurately distinguished between gliomas, meningioma, pituitary and non-tumor cases.

## Extracurricular Activities

### Mathematics Directed Reading Program

January 2025 - Present

- Supervised study of quiver representation and variates, as well as an introduction to representation theory and algebraic geometry.

### Intramural Soccer - Rampant Lions

September 2024 - Present

- Starting goalkeeper for intramural mixed division, and advanced to the semi-finals in the playoff tournament.

## Technical Skills

- **Languages:** Python, R, Java, C++, GraphQL.
- **Data Types:** RNA-seq, scRNA-seq, DNA Methylation, Microscopy, Spatial Transcriptomics..
- **Techniques:** RNA interference, Polymerase chain reaction, DNA electrophoresis, plasmid cloning and beta-galactosidase assays.