

# Nolan Dey

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## SKILLS

**Research:** Python, PyTorch, TensorFlow, Nengo, Keras, SKLearn, Matplotlib, NumPy, SciPy, Pandas, MATLAB  
**Infrastructure:** SLURM, GCP, AWS, Docker, Kafka, Terraform, PostgreSQL, Git, Linux, GraphQL, MongoDB  
**Software Engineering:** Node, React, Redux, Javascript, multiprocessing, Objective-C, Ember, D3, Rails, Scala

## EDUCATION

- MASc in Systems Design Engineering – University of Waterloo** Sep. 2019 - Present  
Supervisors: Bryan Tripp, Graham Taylor, Alexander Wong  
Research Topic: Interpreting tuning dimensions in deep neural networks  
Courses: Simulating Neurobiological Systems, Neural Networks, Advanced Image Processing, Time Series Modelling  
GPA: 92.5/100 (4.0/4.0)
- BASc in Systems Design Engineering (Honours) – University of Waterloo** Sep. 2014 - Apr. 2019  
Exchange term at Lund University (Lund, Sweden)  
GPA: 82.1/100 (3.7/4.0), Graduated with Distinction

## PUBLICATIONS

Identifying and interpreting tuning dimensions in deep networks  
Shared Visual Representations in Human & Machine Intelligence NeurIPS Workshop, 2020  
Nolan S. Dey, J. Eric Taylor, Bryan P. Tripp, Alexander Wong, Graham W. Taylor

37,000 Human-Planned Robotic Grasps With Six Degrees of Freedom  
IEEE Robotics and Automation Letters, 2020  
Victor R. Osorio, Rajan Iyengar, Xueyang Yao, Preshish Bhattachan, Adrian Ragobar, **Nolan Dey**, Bryan Tripp

## EXPERIENCE

- Teaching Assistant – University of Waterloo (Waterloo, Canada)** Jan. 2020 - Present  
• Full TA for SYDE 461 (Systems Design Capstone Project 1), full TA for SYDE 361 (Engineering Design), and half TA for SYDE 223 (Algorithms and Data Structures)
- Machine Learning Research Intern – Mind Foundry (Oxford, UK)** Jun. 2018 - Aug. 2018  
• Worked under Prof. Stephen Roberts to develop a method to predict the training time and memory usage of machine learning algorithms given a dataset and hyperparameters, using SKLearn, Matplotlib, GCP
- Machine Learning & Web Intern – Apple (Cupertino, USA)** Sep. 2017 - Dec. 2017  
• Identified and automated a costly labelling process with image classifier using SKLearn, MATLAB, NumPy  
• Created a scheduling application with Ember, Rails, and D3 which improved internal workflows
- Data Science Intern – Capital One (Kitchener, Canada)** Jan. 2017 - Apr. 2017  
• Developed and deployed a distributed event data pipeline that processed 480 MB/s and saved \$200k/year  
• Leveraged Python, Scala, Docker, Terraform, Ansible, AWS, Kafka, Snowplow, and PostgreSQL in pipeline

- Full-Stack Developer Intern – Parabol (Remote)** Sep. 2016 - Dec. 2016
- Remotely contributed to open-source web-app using Node, React, Redux, RethinkDB, GraphQL
- Software Engineering Intern – Connected (Toronto, Canada)** May 2016 - Aug. 2016
- Developed microservices using Node, React, MongoDB, CloudFoundry, and pair programming
- iOS Developer Intern – Kik (Waterloo, Canada)** Sep. 2015 - Dec. 2015
- Wrote major social sharing feature in Objective-C for an app with over 200M users
- Quality Assurance Engineering Intern – Kik (Waterloo, Canada)** Jan. 2015 - Apr. 2015
- Rigorously tested new features, conducted usability testing, and worked with developers to find issues

## PROJECTS

### Actor-Critic Reinforcement Learning using Spiking Neurons

Nolan Dey

- Released the only open-source implementation of "[Reinforcement Learning Using a Continuous Time Actor-Critic Framework with Spiking Neurons](#)" by Frémaux et al. using Nengo and OpenAI Gym

### Synthesizing Preferred Inputs for Deep Neurons via GANs

Nolan Dey\*, Nick Torenvliet\*, Austin Kothig\*

- Released the only modern open-source implementation of "[Synthesizing the preferred inputs for neurons in neural networks via deep generator networks](#)" by Nguyen et al. using PyTorch (originally Caffe 1.X)

### Graph Convolutional Neural Network Explainability

Nolan Dey

- Released the only open-source implementation of "[Explainability Methods for Graph Convolutional Neural Networks](#)" by Pope & Kolouri et al. using PyTorch Geometric and RDKit

### SYDE 2019 Class Survey

Nolan Dey\*, Jason Manson-Hing\*

- Surveyed 55 respondents from my undergraduate class with questions related to demographics, academics, internships, lifestyle, and post-graduation plans
- Published a [detailed analysis of the survey results](#) with 109 graphs and [open-sourced my code](#) to help future classes conduct similar surveys

## VOLUNTEERING

### Organizer - [Deep Learning Paper Club](#)

Oct 2019 - Present

- Facilitated a collaborative setting where students could present, understand, and discuss exciting papers

### Founder - Carols for Cans

Dec 2012 - Present

- Annually organized event where students sing Christmas carols and ask for food donations
- Donated over 10k of food items to GTA food banks since 2012, with 588 students participating

## ONLINE LEARNING

**Computational Neuroscience** | University of Washington (Coursera)

2019

**Deep Learning Specialization** | deeplearning.ai (Coursera)

2017

**Courses:** Neural Networks and Deep Learning, Improving Deep Neural Networks, Structuring Machine Learning Projects, Convolutional Neural Networks, Sequence Models

**Machine Learning** | Stanford University (Coursera)

2017