

Yani A. Ioannou

CONTACT

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SUMMARY

- Schulich Research Chair & Assistant Professor (Research, Tenure-Track), University of Calgary
- Awarded approximately \$600K CAD in competitive research funding within first year as faculty.
- Ph.D. University of Cambridge (2018) supported by Microsoft Research PhD Scholarship.
- Research experience at the Vector Institute, Google Brain, and Microsoft Research.

ACADEMIC POSITION

University of Calgary, Calgary, Alberta Canada Sept. 2021 – Present
Schulich Research Chair, Assistant Professor (Tenure-Track), Dept. of Electrical & Software Engineering, Schulich School of Engineering

- Lead the Calgary Machine Learning Lab, research topics include: sparse training of deep neural networks, continual learning, implicit bias in efficient deep learning methods.

EDUCATION

University of Cambridge, Cambridge, United Kingdom Nov. 2015 – Oct. 2018
Ph.D. Information Engineering, Department of Engineering

- Supervisors: Prof. Roberto Cipolla, Dr. Antonio Criminisi, Dr. Matthew Brown.
- Thesis: Structural Priors in Deep Neural Networks
- Thesis Examiners: Prof. Andrea Vedaldi (U. Oxford), Prof. Richard Turner (U. Cambridge).

Queen's University, Kingston, Ontario, Canada Sept. 2006 – Mar. 2010
M.Sc. Computing, School of Computing

- Supervisors: Dr. Michael A. Greenspan, Robin Harrap.
- Thesis: Segmentation and Object Recognition in Mobile Urban LIDAR Data.

University of Toronto, Toronto, Ontario, Canada Sept. 2000 – May. 2006
B.Sc. Honours Computer Science Co-op: Software Engineering Specialist.

- Undergraduate Research Advisor: Prof. Richard Zemel.

INDUSTRY & ACADEMIC RESEARCH EXPERIENCE

Vector Institute/University of Guelph, Toronto, Ontario Canada May 13, 2021 – Aug. 31, 2021
Postdoctoral Fellow, School of Engineering

- Supervisor: Prof. Graham Taylor (Research Director, Vector Institute and Professor Canada Research Chair, U. Guelph)

Google, Toronto, Ontario Canada Oct. 7, 2019 – Oct. 6, 2020
Visiting Researcher, Brain Toronto/AR Core

- Supervisors: Dr. Cem Keskin, Dr. Andrea Tagliasacchi.
- Collaborators: Dr. Yann Dauphin, Utku Evcu.
- Research with Google Brain towards improving the training of sparse neural networks.
- R&D with ARCore improving the efficiency of deep neural networks for AR devices.
- Achieved python 'readability', an internal certification for python style/coding competence.

NASA/SETI Institute, Mountain View, California Jul. 2 – Aug. 19, 2018
Invited Researcher, Frontier Development Lab (FDL)

- Supervisor: Dr. Jeffrey C. Smith, Dr. Douglas Cardwell, Dr. Jon M. Jenkins.
- Collaborators: Dr. Megan Ansdell, Dr. Hugh Osborn, Dr. Michele Sasdelli.
- NASA research accelerator partnering machine learning experts with space scientists.
- Increased the efficacy and yield of exoplanets detection over existing methods.
- Used by NASA to process data from the Transiting Exoplanet Survey Satellite (TESS).

Wayve Technologies, Cambridge, United Kingdom Oct. 2017 – Jul. 2018
Research Scientist, Imitation Learning

- Research into new imitation learning methods for self-driving cars at a seed-level startup.
- Technology created was critical to Wayve's series-A funding round success.

Microsoft Research, Cambridge, United Kingdom

Student Researcher (Business Guest)

Dec. 2014 – Sept. 2017

Research Intern

Mar. 2014 – Dec. 2014

- Supervisor: Dr. Antonio Criminisi
- Collaborators: Dr. Jamie Shotton, Dr. Dimitrios Vytiniotis, Dr. Duncan Robertson
- Worked with a team of researchers on a 9-month special research project exploring deep learning methods for supervised large scale visual recognition.
- Collaboration for duration of Ph.D. on research in deep learning/computer vision.

University of Toronto/University Health Network, Toronto, Ontario Canada

Mar. 2011 – Nov. 2013

Research Associate, Intelligent Assistive Technology and Systems Lab

- Supervisor: Prof. Alex Mihailidis, P.Eng.
- Led R&D of the Personal Emergency Response System (PERS), a computer vision driven fall detection system prototype, hardware/software implementation of prototypes
- Supervised undergraduate research interns.

HONOURS AND AWARDS

Engineering Students' Society Teaching Excellence Award

2024

Student-nominated award recognizing excellence in undergraduate teaching in software engineering.

Schulich School of Engineering Early Research Excellence Award

2023

Awarded to non-tenured faculty who have made substantial research contributions.

Asian Conference on Computer Vision (ACCV)

2022

Outstanding Reviewer

Neural Information Processing Systems (NeurIPS)

2022

Top Reviewer

Complimentary Registration, \$900 USD

International Conference on Learning Representations (ICLR)

2022

Highlighted Reviewer

Complimentary Registration

Amazon Research Award, Fall 2021

Fall, 2021

Awarded to select approximately 53 faculty worldwide

\$50,000 USD

Asian Conference on Computer Vision (ACCV)

2020

Outstanding Reviewer

NeurIPS Travel Award

2016

Awarded to select students for conference registration.

\$200 USD

ICLR Travel Award

2016

Awarded to select students for conference expenses.

\$1500 USD

Microsoft Research Travel Award

2016

Awarded to present MSR collaborative work at CVPR 2016.

£1200

Microsoft Research PhD Scholarship

2013–2017

One of only 20 awarded annually in Europe, Middle East and Africa.

Approx. £60,000

GRANTS & FELLOWSHIPS

Digital Research Alliance of Canada — Resource Allocation Competition (RAC)

2024–2025

The RAC is an annual competitive grant that enables research groups to access guaranteed access to national GPU/CPU compute and storage resources. The Calgary ML lab was awarded 25 Reference GPU Units (RGU) of compute, equivalent to 6.25 A100 GPU years.

\$27,487

Alberta Innovates (AI) Advance and Natural Sciences and Engineering Research Council (NSERC) Alliance — Stream I

2022–2023

Alberta Innovates Advance Stream I is awarded to recipients of the NSERC Discovery Grant in Alberta's emerging technology areas.

\$30,000

Alberta Innovates (AI) Advance and Natural Sciences and Engineering Research Council (NSERC) Alliance — Stream II

2022–2023

Alberta Innovates Advance Stream II is awarded based on the evaluation of both AI and NSERC of a proposed research program in emerging technologies, and alignment with objectives of the AI Advance program.

\$300,000

Department of National Defence (DND) Supplement to the Natural Sciences and Engineering Research Council (NSERC) Discovery Grant

2022–2025

The DND supplement is a highly competitive award (only 20 are awarded annually) based on the merit of a NSERC Discovery Grant proposal.

\$120,000

Natural Sciences and Engineering Research Council (NSERC) Discovery Launch Supplement 2022
The Discovery Launch Supplement is awarded to all Early Career Researchers who are recipients of their first Discovery Grant. \$12,500

Natural Sciences and Engineering Research Council (NSERC) Discovery Grant 2022–2027
The Discovery Grants program assists in promoting and maintaining a diversified base of high-quality research capability in the natural sciences and engineering in Canadian universities; fostering research excellence; providing a stimulating environment for research training. \$125,000

PUBLICATIONS

Note: Top-tier conferences are the primary publication venue of computer vision/machine learning, having impact factors equal or higher than top-tier journals in other fields. Conference papers are full length, double-blind peer reviewed, and published in proceedings. NeurIPS/CVPR/ICLR acceptance is ~20%.

PEER-REVIEWED PUBLICATIONS

Dynamic Sparse Training with Structured Sparsity

Mike Lasby, Anna Golubeva, Utku Evci, Mihai Nica, Yani Ioannou

International Conference on Learning Representations (ICLR) 2024

Vienna, Austria

May 7 – 11, 2024

Bounding generalization error with input compression: An empirical study with infinite-width networks

Angus Galloway, Anna Golubeva, Mahmoud Salem, Mihai Nica, Yani Ioannou, Graham W Taylor

Transactions on Machine Learning Research (TMLR)

Dec. 3rd, 2022

Gradient Flow in Sparse Neural Networks and How Lottery Tickets Win (Oral Presentation)

Utku Evci, Yani Ioannou*, Cem Keskin, Yann Dauphin*

36th AAAI Conference on Artificial Intelligence

Vancouver, BC, Canada

Feb. 22 – Mar. 1st, 2022

Rapid Classification of TESS Planet Candidates with Convolutional Neural Networks

Hugh P. Osborn, Megan Ansdell, Yani Ioannou, Michele Sasdelli, Daniel Angerhausen, Douglas A. Caldwell, Jon M. Jenkins, Chedy Räissi, Jeffrey C. Smith

Astronomy & Astrophysics, Volume 633 (A53)

Jan. 10th, 2020

Scientific Domain Knowledge Improves Exoplanet Transit Classification with Deep Learning

Megan Ansdell, Yani Ioannou, Hugh P Osborn, Michele Sasdelli, Jeffrey C Smith, Jon M Jenkins, Chedy Raissi, Daniel Angerhausen

Astrophysical Journal Letters, Volume 869 (1)

Dec. 5th, 2018

Automated Fall Detection Technology in Inpatient Geriatric Psychiatry

Marge Coahran, Loretta M Hillier, Lisa Van Bussel, Edward Black, Rebekah Churchyard, Iris Gutmanis, Yani Ioannou, Kathleen Michael, Tom Ross, Alex Mihailidis

Canadian Journal on Aging, Volume 37 (3)

Sept., 2018

Deep Roots: Improving CNN Efficiency with Hierarchical Filter Groups

Yani Ioannou, Duncan Robertson, Roberto Cipolla, Antonio Criminisi

30th IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

Honolulu, Hawaii, USA

Jul. 21 – 26, 2017

Measuring Neural Net Robustness with Constraints

Osbert Bastani, Yani Ioannou, Leonidas Lampropoulos, Dimitrios Vytiniotis, Aditya Nori, Antonio Criminisi

13th Annual Conference on Neural Information Processing Systems (NeurIPS)

Barcelona, Spain

Dec. 5 – 10, 2016

Refining Architectures of Deep Convolutional Neural Networks

Sukrit Shankar, Duncan Robertson, Yani Ioannou, Antonio Criminisi, Roberto Cipolla

29th IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

Las Vegas, Nevada, USA

Jun. 27 – 30, 2016

Training CNNs with Low-Rank Filters for Efficient Image Classification

Yani Ioannou, Duncan Robertson, Jamie Shotton, Roberto Cipolla, Antonio Criminisi

International Conference on Learning Representations (ICLR) 2016

San Juan, Puerto Rico

May 2 – 4, 2016

*These authors contributed equally to this paper.

Difference of Normals as a Multi-Scale Operator in Unorganized Point Clouds

Yani Ioannou, Babak Taati, Robin Harrap, Michael Greenspan

IEEE International Conference on 3D Imaging, Modelling, Processing, Visualization and Transmission (3DIMPVT)

Zurich, Switzerland

Oct. 13 – 15, 2012

Local Potential Well Space Embedding

Yani Ioannou, Limin Shang, Robin Harrap, Michael Greenspan

IEEE International Workshop on 3-D Digital Imaging and Modeling (3DIM), IEEE International Conference on Computer Vision

Kyoto, Japan

Oct. 3 – 4, 2009

PATENTS

Emergency Detection and Response System and Method

Alex Mihailidis, Babak Tatti, Yani Ioannou, Jennifer Boger, James E. Gastle

United States Patent Application Publication #US2013/0100268 A1

Apr. 25, 2013

INVITED TALKS

Aligning Research in Sparsity with Hardware ICLR 2023 Workshop on Sparsity in Neural Networks
Kigali, Rwanda May. 5, 2023

Training Unstructured Sparse Neural Networks Visual Computing Lab, Electronic Engineering Department

Hanyang University, South Korea

Aug. 18, 2022

Inductive Bias in Deep Learning: From Structure to Training IEEE Southern Alberta Computer Society Chapter

University of Calgary, Calgary AB, Canada

April 20, 2022

Efficient Neural Networks

Schulich School of Engineering

University of Calgary, Calgary AB, Canada

Apr. 16, 2021

Efficient Neural Networks

Dept. of Computer Science and Software Engineering

Concordia University, Montréal QC, Canada

Apr. 9, 2021

Gradient Flow in Sparse Neural Networks

Vector Institute Invited Talk

Vector Institute, Toronto ON, Canada

Feb. 24, 2021

Structural Priors in Deep Neural Networks

Apple Turi Team

Apple, Seattle WA, USA

Apr. 23, 2019

Structural Priors in Deep Neural Networks

Google Daydream/Google Brain

Google, San Francisco CA, USA

Apr. 15, 2019

Structural Priors in Deep Neural Networks

Department of Computer Science

University of Victoria, Victoria BC, Canada

Apr. 08, 2019

Structural Priors in Deep Neural Networks

Mobile Computer Vision Group

Facebook, Menlo Park, CA, USA

March. 18, 2019

Structural Priors in Deep Neural Networks

Department of Computer Science

University of British Columbia, Okanagan Campus, Kelowna BC, Canada

Mar. 4, 2019

Structural Priors in Deep Neural Networks

School of Computer Science

McGill University, Montréal QC, Canada

Mar. 12, 2018

Structural Priors in Deep Neural Networks

Toronto Rehab Journal Club

University of Toronto, Toronto ON, Canada

Aug. 29, 2017

Restricted Connectivity in Deep Neural Networks

Statistical Learning for Signal Processing Lab

Korea Advanced Institute of Science and Technology, Daejeon, South Korea

Apr. 17, 2017

Restricted Connectivity in Deep Neural Networks

Microsoft Research Cambridge

Microsoft Research, Cambridge, UK

Mar. 21, 2017

SHORT PAPERS & WORKSHOPS PRESENTATIONS

Classification Bias on a Data Diet

Tejas Pote, Mohammed Adnan, Yigit Yargic, and Yani Ioannou

1st Conference on Parsimony and Learning (CPAL)

Hong Kong, Hong Kong SAR, China

Jan 3–6, 2024

Meta-GCN: A Dynamically Weighted Loss Minimization Method for Dealing with the Data Imbalance in Graph Neural Networks

Mahdi Mohammadzadeh, Arash Mozhdehi, Yani Ioannou and Xin Wang
36th Canadian Conference on Artificial Intelligence (CANAI)
McGill University, Montreal, QC, Canada

June 7, 2023

Monitoring Shortcut Learning using Mutual Information

Mohammad Adnan, Yani Ioannou, CY Tsai, A Galloway, HR Tizhoosh, GW Taylor
ICML 2022 Workshop on Spurious Correlations, Invariance and Stability
Baltimore, MD, USA

July 22, 2022

Condensing Sparse Layers

Anna Golubeva, Mike Lasby, Yani Ioannou, and Mihai Nica
2nd Workshop on Sparsity in Neural Networks
Virtual

July 13, 2022

Domain-Agnostic Clustering with Self-Distillation

Mohammad Adnan, Yani Ioannou, CY Tsai, GW Taylor
2nd NeurIPS Workshop on Self-Supervised Learning: Theory and Practice
Virtual

Dec. 14, 2021

How Different Are Lottery Tickets and the Pruned Solution?

Utku Evci, Yani Ioannou, Cem Keskin, Yann Dauphin
Montreal AI Symposium
Montréal, Québec, Canada

Sept. 11, 2020

Automatic Classification of Transiting Planet Candidates using Deep Learning

Megan Ansdell, Yani Ioannou, Hugh P Osborn, Michele Sasdelli, Daniel Angerhausen, Douglas A. Caldwell, Jon M. Jenkins, Chedy Räissi, Jeffrey C. Smith
Astronomical Data Analysis Software and Systems XXVIII
University of Maryland, College Park, Maryland, USA

Oct. 11 – 15th, 2020

The NASA FDL Exoplanet Challenge: Transit Classification with Convolutional Neural Networks

Daniel Angerhausen, Megan Ansdell, Hugh Osborn, Yani Ioannou, Michele Sasdelli, Chedy Räissi, Jeffrey C. Smith, Douglas Caldwell, Jon M. Jenkins
Astrobiology Science Conference
Seattle, Washington, USA

June 28th, 2019

Segmentation of Brain Tumor Tissues with Convolutional Neural Networks

Darko Zikic, Yani Ioannou, Antonio Criminisi, Matthew Brown
MICCAI workshop on Multimodal Brain Tumor Segmentation Challenge (BRATS)
Boston, Massachusetts, USA

Sept. 14, 2014

TECHNICAL REPORTS

Rapid Classification of Exoplanet Transits with Deep Learning

Megan Ansdell, Yani Ioannou, Hugh Osborn, Michele Sasdelli
NASA Frontier Development Lab Technical Memorandum

Aug. 2018

Decision Forests, Convolutional Networks and the Models in-Between

Yani Ioannou, Duncan Robertson, Darko Zikic, Peter Kotschieder, Jamie Shotton, Matthew Brown, Antonio Criminisi
Microsoft Research Technical Report #2015-58

Apr. 1, 2015

TEACHING EXPERIENCE

University of Calgary, Calgary, Alberta Canada

Jan. 2022 – present

Assistant Professor, Schulich School of Engineering

Course instructor, responsible for lectures, assignments, and exams.

- ENSF619.05/04 Representation Learning in Deep Neural Networks (graduate) Fall 2022, 2023
- SENG401 Software Architecture (3rd year) Winter 2022 – 2024
- ENSF444 Machine Learning Systems (3rd year) Winter 2024

University of Toronto, Toronto, Ontario Canada

Jan. 2021 – Aug. 2021

Sessional Lecturer, Faculty of Applied Science and Engineering

Course instructor, responsible for lectures, assignments, and exams.

- APS360 Applied Fundamentals of Machine Learning (3rd year)

Winter Summer 2021

- University of Toronto**, Toronto, Ontario Canada Dec. 2018 – May. 2019
Sessional Lecturer, Department of Computer Science
 Course instructor, responsible for lectures, assignments, and exams.
- CSC320 Introduction to Visual Computing (3rd year) Winter 2019
 - Student ratings: “Instructor generated enthusiasm”: 4.4/5, “Instructor created an atmosphere conducive to my learning”: 4.2/5, “Intellectually stimulating”: 4.2/5
- University of Cambridge**, Cambridge, United Kingdom Oct. 2016 – Dec. 2017
Demonstrator, Department of Engineering
 Taught laboratory sessions, marked assignments.
- Part 1B Introduction to C++ (1st year) Lent Term 2016, 2017
- University of Bath**, Bath, United Kingdom Jan. 2013 – Mar. 2013
Teaching Assistant, Department of Computer Science
 Taught laboratory sessions, marked assignments
- CM10228 Principles of Programming 2 (1st year) Semester 2, 2013.
- University of Toronto**, Scarborough, Ontario Canada Sept. 2008 – Dec. 2008
Graduate Teaching Assistant, Dept. Computer and Mathematical Sciences
 Taught tutorials, held office hours, marked midterms, exams and assignments
- CSCD27 Computer and Network Security (4th year) Fall 2008
- Queen’s University**, Kingston, Ontario Canada Sept. 2006 – May 2008
Teaching Assistant, School of Computing
 Taught labs, held office hours, marked midterms and assignments
- CISC452 Neural and Genetic Computing (4th year) Fall 2007
 - CISC124 Introduction to Computing Science (1st year) Spring 2007, 2008
 - CISC101 Elements of Computing Science (1st year) Fall 2006
- University of Toronto**, Scarborough, Ontario Canada Sept. 2000 – May. 2005
Undergraduate Teaching Assistant, Dept. Computer and Mathematical Sciences
 Taught tutorials, held office hours, marked midterms, exams and assignments
- CSCC85 Microprocessor Systems (3rd year) Spring 2004, 2005
 - CSCB28 File Structures and Data Management (2nd year) Spring 2003
 - CSCB09 Methods and Tools for Software Development (2nd year) Spring 2003
 - CSCA58 Introduction to Computer Science (1st year) Spring 2002
 - CSCA06/A08 Introduction to Computer Programming (1st year) Fall 2001 – 2005

ACADEMIC LEADERSHIP

- Area Chair**, Neural Information Processing Systems (NeurIPS): Mar. 2024 – Dec. 2025
 Invited to be an Area Chair for the Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS), the top Machine Learning conference, and 9th highest impact publication venue of all fields as ranked by Google Scholar Metrics.
- Publicity Co-Chair**, 1st Conference on Parsimony and Learning (CPAL): Mar. 2023 – Jan. 2024
 Invited to co-chair a new conference in the field of low-dimensional structures for machine learning, which was held in January 2024.
- Faculty Leader/Organizer**: Global Engineering Experience Trip: Winter 2023
 Together with Dr. Hatem Abou-Zeid, responsible for organizing the trip itinerary and leading 22 students in a week-long trip to Silicon Valley.
- Capstone Academic Advisor**: Fall/Winter 2022 – present
 2023–2024: Academic advisor to four capstone projects with industry partners such as RBC and AMD.
 2022–2023: Academic advisor for three capstone projects: Sink or Swim, Best in the West (Partner: WestJet), Tax Receipt Validation (Partner: Benevity)
- Sparsity Reading Group Co-organizer**: Jan. 2023 – Present
 Co-Lead a reading group in partnership with Google Brain bi-monthly on sparse neural networks.
- Sparsity Reading Group Co-organizer**: May 2022 – Dec. 2023
 Lead a reading group, along with Dr. Anna Golubeva, attended weekly by approx. 6–10 researchers at MIT, University of Alberta, and University Michigan, amongst other institutions.
- Women in Machine Learning (WiML) PhD Applications Mentor**: Sep. 2022 – Feb. 2023
 Mentored three potential students in applying to Machine Learning PhD programs.

Associate Editor: International Conference on Pattern Recognition (ICPR)

2022

Reviewer: I rarely refuse an opportunity to review recognizing the importance of academic service, and have reviewed for:

International Conference on Computer Vision and Pattern Recognition (CVPR), International Conference on Learning Representations (ICLR), International Conference on Machine Learning (ICML), Neural Information Processing Systems (NeurIPS), European Conference on Computer Vision (ECCV), Asian Conference on Computer Vision (ACCV), Transactions on Pattern Analysis and Machine Intelligence (TPAMI), International Journal of Computer Vision (IJCV)

OPEN SOURCE

I have contributed to many open source projects, including:

Linux Kernel – Linux is the operating system used by 19 Million PCs, the 79% of smartphones running Android, and 97% of web servers, including those of Google, Facebook and Amazon.

Point Cloud Library – Contributed code/tutorials for Difference of Normals.

Flax – A Google framework for training neural networks using JAX.

PROFESSIONAL MEMBERSHIP

Institute of Electrical and Electronics Engineers (IEEE)

2005 – 2014, 2022 – Present

Computer Vision Foundation (CVF)

A non-profit organization whose purpose is to foster and support research on all aspects of computer vision. Notably runs CVPR and ICCV.

2013 – Present