Yani A. Ioannou

CONTACT

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SUMMARY

- Assistant Professor (Research, Tenure-Track), Schulich School of Engineering, 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*

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 receipients 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 Mohammadizadeh, 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*

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 Kontschieder, Jamie Shotton, Matthew Brown, Antonio Criminisi*
Microsoft Research Technical Report #2015-58   *Apr. 1, 2015*

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 conductive 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*