Dr. Yani A. Ioannou

Contact Information

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Summary

- Assistant Professor (Research, Tenure-Track), Schulich School of Engineering, University of Calgary
- Ph.D. Computer Vision, University of Cambridge (2018), Microsoft Research PhD Scholarship.
- Published at top conferences in Machine Learning/Computer Vision: NeurIPS, CVPR, ICLR, 3DV.
- Experience at leading research labs: Vector Institute, Google Brain, Microsoft Research.

Education

University of Cambridge, Cambridge, United Kingdom — *Nov. 2015 – Oct. 2018*

Ph.D. Information Engineering, Department of Engineering

- Research Topics: computer vision, efficient deep learning, medical, adversarial examples.
- Microsoft Research Ph.D. Scholarship.
- 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.
- Research Topics: 3D computer vision, pointclouds.
- Thesis: Segmentation and Object Recognition in Mobile Urban LIDAR Data.

University of Toronto, Scarborough, Ontario, Canada — *Sept. 2000 – May. 2006*

B.Sc. Honours Computer Science Co-op: Software Engineering Specialist.

- Specialist program is the equivalent of a double major.
- Co-op: 1 year of industry experience (see Professional Experience)

Employment History

University of Calgary, Calgary, Alberta Canada — *Sept. 1, 2021 – Present*

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

- Research Topics: unstructured sparse neural networks, training, initialization.
- Department of Electrical & Software Engineering.

Vector Institute/University of Guelph, Toronto, Ontario Canada — *May 13, 2021 – Aug. 31, 2021*

Postdoctoral Fellow, School of Engineering

- Supervisor: Prof. Graham Taylor.
- Collaborators: Prof. Mihai Nica.
- Research on adversarial robustness and sparse neural network training.
- Mentoring Prof. Graham Taylor's PhD and MSc students.

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.
- 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.

University of Toronto, Toronto, Ontario, Canada *Sept. 2005 – July 2006*

Undergraduate Research Assistant, Department of Computer Science

- Supervisors: Prof. Richard Zemel, Dr. Xuming He, Collaborators: Dr. Volodymyr Mnih.
- Helped collect data for research towards outdoor localization using computer vision.

IBM Canada Ltd., Markham, Ontario, Canada *Sept. 2004 – May 2005*

DB2 Tester/Developer (Co-op), DB2 UDB

- Supervisor: Martin Schlegel (Automation and Integration Lead at IBM)
- Developed a new testing framework for internal and external use by Linux distribution and hardware vendors.
- Validated DB2 for beta and release candidate Linux distributions on 4 different computer architectures.
- Worked with DB2 and SUSE developers to isolate critical bugs in RHEL and SUSE distribution.

Protana Inc., Toronto, Ontario, Canada *May. 2004 – Sept. 2004*

Junior IT Specialist,

- Site of Canada's fastest supercomputer (in 2004), a cluster of approx. 100 IBM x86 nodes running Linux (RHEL).
- Administration and maintenance of data center including Linux cluster nodes, IBM P-series AIX-based database and backup systems, in addition to support of SGI IRIX-based and Windows workstations.

Publications

Note: Top-tier conferences are the primary publication venue of computer vision/machine learning, conference papers are full length, peer reviewed, and published in proceedings. NeurIPS/CVPR acceptance is ∼20%.

Works Submitted /Pre-print

Gradient Flow in Sparse Neural Networks and How Lottery Tickets Win
Utku Evci, Yani Ioannou*, Cem Keskin, Yann Dauphin*
arXiv pre-print: 2010.03533 *Oct. 7th, 2020*

Peer-reviewed Publications

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*

*These authors contributed equally to this paper.

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*

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

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

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

Teaching Experience

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) Summer, 2021.
- APS360 Applied Fundamentals of Machine Learning (3rd year) Winter, 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

Honours and Awards

Asian Conference on Computer Vision (ACCV) *2020*
Outstanding Reviewer N/A

Google *2020*
Signing Bonus Undisclosed

NeurIPS Travel Award *2016*
Awarded to select students for conference registration. $200

ICLR Travel Award *2016*
Awarded to select students for conference expenses. $1500

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

University of Toronto Entrance Scholarship *2000*
Tuition credit. CAD $2000

Computer Science Award — Sir Oliver Mowat Collegiate Institute *2000*
High school award for excellence in computer science. CAD $500

Volunteer Work

Reviewer: I rarely refuse an opportunity to review recognizing the importance of academic service.
International Conference on Computer Vision and Pattern Recognition (CVPR), 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 Contributor: 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

IEEE Prior to the Computer Vision Foundation, the IEEE was respoinsible for running many of the premier computer vision publication venues. *2005 – 2014*

Computer Vision Foundation 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*

References

Please contact me for a full list of referees.