Jimmy Lei Ba

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RESEARCH INTERESTS

I am a fourth year PhD student researching deep neural networks. In particular, my focus is on developing attention-based machine learning models in the applications of computer vision. Also, I am broadly interested in questions related to computational cognitive science, artificial intelligence and Bayesian statistics.

EDUCATION

Doctor of Philosophy, Electrical & Computer Engineering **2013 - Present**
University of Toronto, Toronto, Ontario

Master of Applied Science, Electrical & Computer Engineering **2011 - 2013**
University of Toronto, Toronto, Ontario

Bachelor of Applied Science, Electrical & Computer Engineering **2007 - 2011**
University of Toronto, Toronto, Ontario

SELECTED PUBLICATIONS

Preprints:

- **Ba, J.**, Kiros, J. R. and Hinton, G., (2016), "Layer Normalization", *arXiv preprint arXiv:1607.06450*

Publications in refereed proceedings:

- **Ba, J.**, Hinton, G., Mnih, V., Leibo, J. and Ionescu, C., (2016), "Using Fast Weight to Attend to the Recent Past", *Advances in the 2016 Neural Information Processing System (NIPS'16)*
- Kraus, O., **Ba, J.** and Frey, B., (2016), "Classifying Microscopy Images Using Convolutional Multiple Instance Learning", *Bioinformatics 32(12), 52-59*
- Mansim, E., Parisotto, E., **Ba, J.** and Salakhutdinov, R., (2016), "Generating Images From Captions with Attention", *Proceedings of the 2016 International Conference on Learning Representations (ICLR'16)*
- Parisotto, E., **Ba, J.** and Salakhutdinov, R., (2016), "Actor-Mimic: Deep Multitask and Transfer Reinforcement Learning", *Proceedings of the 2016 International Conference on Learning Representations (ICLR'16)*
- **Ba, J.**, Grosse, R., Salakhutdinov, R. and Frey, B., (2015), "Learning Wake-Sleep Recurrent Attention Models", *Advances in the 2015 Neural Information Processing System (NIPS'15)*
- **Ba, J.**, Swersky, K., Fidler, S. and Salakhutdinov, R., (2015), "Predicting Deep Zero-Shot Convolutional Neural Networks using Textual Descriptions", *Proceedings of 2015 International Conference on Computer Vision (ICCV'15),*
- Xu, K.**, Ba, J.**, Kiros, R., Cho, K., Courville, A., Salakhutdinov, R., Zemel, R. and Bengio, Y., (2015), "Show, Attend and Tell: Neural Image Caption Generation with Visual Attention", *Proceedings of 2015 International Conference on Machine Learning (ICML'15)*
- **Ba, J.** and Kingma D., (2015), "Adam: A Method for Stochastic Optimization", *Proceedings of the 2015 International Conference on Learning Representations (ICLR'15)*
- **Ba, J.,** Mnih, V. and Kavukcuoglu K., (2015), "Multiple Object Recognition with Visual Attention", *Proceedings of the 2015 International Conference on Learning Representations (ICLR'15)*

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- **Ba, J.,** Xiong and H, Frey, B., (2014), "Making Dropout Invariant to Transformations of Activation Functions and Inputs", *Advances in the 2014 Neural Information Processing System (NIPS'14) deep learning workshop*
- **Ba, J.** and Caruana, R., (2014), "Do deep nets really need to be deep?", *Advances in the 2014 Neural Information Processing System (NIPS'14)*
- **Ba, J.** and Frey, B., (2013), "Adaptive Dropout for Training Deep Neural Networks", *Advances in the 2013 Neural Information Processing System (NIPS'13)*

HONORS & AWARDS

Facebook Graduate Student Fellowship **2016 – Present**

University of Toronto **2009 – Present**

- **Electrical and Computer Engineering Outstanding Student Award** (2009 - 2011)
- **University of Toronto Excellent Award in the Natural Science and Engineering** (2009 - 2010)
- **Dean's Honours List**
- **Collage of Physics and Engineering Science Dean's Scholarship (**2007 - 2008)

Others

- **Canadian Euclid Mathematic Competition, Special Award** (2007)

TEACHING EXPERIENCE

ECE521 Inference Algorithms and Machine Learning **2015**
Guest lecturer on inference algorithms and message-passing, University of Toronto

ECE521 Inference Algorithms and Machine Learning **2015**
Head TA, designed two new assignments, 7 weeks of tutorial sessions, University of Toronto

CSC2523 Deep Learning in Computer Vision **2015**
Guest lecturer on neural programming, University of Toronto

CSC321 Introduction to Neural Networks and Machine Learning **2014**
Guest lectuer on probability theory and inference algorithms, University of Toronto

CSC321 Introduction to Neural Networks and Machine Learning **2014**
Tutorial TA, 4 weeks of tutorial sessions and lecture assistant, University of Toronto

ECE1510/CSC2535 Advanced Inference Algorithms/Advanced Machine Learning **2014**
Guest lecturer on deep learning, University of Toronto

ECE521 Inference Algorithms and Machine Learning **2013**
Guest lecturer on neural netowrks and deep learning, University of Toronto

ECE521 Inference Algorithms and Machine Learning **2013**
Tutorial TA, 6 weeks of tutorial sessions, University of Toronto

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WORK EXPERIENCE, TEAM WORK, AND COMMUNICATION

Research Intern **2014**
Google Deepmind, London, England

Research Intern **2013**
Microsoft Research, Redmond, Washington

Software Development Engineer **2009**
Sybase iAnywhere Inc., Waterloo, Ontario

INDEPENDENT RESEARCH AND DEVELOPMENT

Machine Learning **2014 – Present**
Research Assistant, Dept. of Computer Science, University of Toronto
Supervisor: Geoffrey Hinton, Brendan Frey & Ruslan Salakhutdinov

Machine Learning and Computer Vision **2011 – 2013**
Research Assistant, Dept. of Electrical and Computer Engineering, University of Toronto
Supervisor: Brendan Frey

Signal Processing and Multimedia Wearable Computing **2010**
Research Assistant, Dept. of Electrical and Computer Engineering, University of Toronto
Supervisor: Steve Mann