

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 deep learning models and stochastic optimization algorithms. Also, I am broadly interested in questions related to computational cognitive science, artificial intelligence and Bayesian statistics.

EDUCATION

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| Doctor of Philosophy, Electrical & Computer Engineering University of Toronto, Toronto, Ontario | 2013 - Present |
| Master of Applied Science, Electrical & Computer Engineering University of Toronto, Toronto, Ontario | 2011 - 2013 |
| Bachelor of Applied Science, Electrical & Computer Engineering University of Toronto, Toronto, Ontario | 2007 - 2011 |

SELECTED PUBLICATIONS

Publications in refereed proceedings:

- **Ba, J.**, Grosse, R. and Martens, J., (2017), “Distributed Second-Order Optimization using Kronecker-factored Approximation”, *Proceedings of the 2017 International Conference on Learning Representations (ICLR’17)*
- **Ba, J.**, Kiros, J. R. and Hinton, G., (2016), “Layer Normalization”, *Neural Information Processing System Deep Learning Symposium 2017*
- **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)*
- Kingma D., **Ba, J.**, (2015), “Adam: A Method for Stochastic Optimization”, *Proceedings of the 2015 International Conference on Learning Representations (ICLR’15)*

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- **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)*
- **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 **2017**
Course instructor and coordinator, University of Toronto

ECE521 Inference Algorithms and Machine Learning **2016**
Head TA and guest lecturer, University of Toronto

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 lecturer 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

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| 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 networks and deep learning, University of Toronto | |
| ECE521 Inference Algorithms and Machine Learning | 2013 |
| Tutorial TA, 6 weeks of tutorial sessions, University of Toronto | |

WORK EXPERIENCE, TEAM WORK, AND COMMUNICATION

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| 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

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|---|-----------------------|
| 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 | |
