

# Jimmy L. Ba

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University of Toronto

## RESEARCH INTERESTS

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Jimmy Ba is an Assistant Professor in the Department of Computer Science at the University of Toronto starting 2018. His research focuses on developing novel learning algorithms for neural networks. He is broadly interested in questions related to reinforcement learning, computational cognitive science, artificial intelligence, computational biology and statistical learning theory.

## EDUCATION

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<b>Doctor of Philosophy, Electrical &amp; Computer Engineering</b> University of Toronto, Toronto, Ontario	<b>2014 - 2018</b>
<b>Master of Applied Science, Electrical &amp; Computer Engineering</b> University of Toronto, Toronto, Ontario	<b>2011 - 2014</b>
<b>Bachelor of Applied Science, Electrical &amp; Computer Engineering</b> University of Toronto, Toronto, Ontario	<b>2007 - 2011</b>

## FELLOWSHIPS & AWARDS

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<b>Facebook Graduate Student Fellowship</b>	<b>2016 – 2018</b>
<b>Massey College Junior Fellowship</b>	<b>2013 – 2017</b>
<b>University of Toronto</b>	<b>2009 – Present</b>
<ul style="list-style-type: none"> <li>● <b>Rogers Scholarship in the Department of Electrical and Computer Engineering</b> (2011 - Present)</li> <li>● <b>Electrical and Computer Engineering Outstanding Student Award</b> (2009 - 2011)</li> <li>● <b>University of Toronto Excellent Award in the Natural Science and Engineering</b> (2009 - 2010)</li> <li>● <b>College of Physics and Engineering Science Dean’s Scholarship</b> (2007 - 2008)</li> </ul>	
<b>Others</b>	
<ul style="list-style-type: none"> <li>● <b>Canadian Euclid Mathematics Competition, Special Award</b> (2007)</li> </ul>	

## SELECTED PUBLICATIONS

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### Publications in refereed proceedings:

- Wang, T., Liao, R., Ba, J. and Fidler, S., “NerveNet: Learning Structured Policy with Graph Neural Networks”, *Proceedings of the 2018 International Conference on Learning Representations (ICLR’18)*
- Martens, J., Ba, J. and Johnson, M., “Kronecker-factored Curvature Approximations for Recurrent Neural Networks”, *Proceedings of the 2018 International Conference on Learning Representations (ICLR’18)*
- Wen, Y., Vicol, P., Ba, J., Tran, D. and Grosse, R., “Flipout: Efficient Pseudo-Independent Weight Perturbations on Mini-Batches”, *Proceedings of the 2018 International Conference on Learning Representations (ICLR’18)*
- Wu, Y., Mansimov, E., Liao, S., Grosse, R. and Ba, J., (2017), “Scalable trust-region method for deep reinforcement learning using Kronecker-factored approximation”, *Advances in the 2017 Neural Information Processing System (NIPS’17)*

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- Kraus, O., Grys, B., Ba, J., Chong, Y., Frey, B., Bonne, C. and Andrews, B., (2017), “Automated Analysis of High-content Microscopy Data with Deep Learning”, *Molecular Systems Biology*, 2017
- 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”, (2016) *Neural Information Processing System (NIPS'16) Deep Learning Symposium*
- 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)*
- 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)*

### INVITED TALKS

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**University of Southern California Visa Research Machine Learning Seminar**  
 “Progress and Challenges in Training Neural Networks”

**Nov 2017**

**Stanford Artificial Intelligence Group**  
 “Interpretable and Scalable Deep Learning”

**Feb 2017**

**Jimmy L. Ba**[jba@cs.toronto.edu](mailto:jba@cs.toronto.edu)

<b>NIPS Deep Learning Symposium</b> “Layer Normalization”	<b>Dec 2016</b>
<b>Google Brain, Mountain View, CA</b> “Distributed Asynchronous Approximate Natural Gradient”	<b>Nov 2016</b>
<b>Stanford Artificial Intelligence Group</b> “Scaling-up Deep Learning using Distributed Asynchronous Second-Order Optimization”	<b>Nov 2016</b>
<b>MIT CSAIL Computer Vision Research Group</b> “Learning Visual Attention for Classification and Zero-shot Learning”	<b>July 2015</b>
<b>Fields Institute, Toronto</b> “Graphical Models and Reinforcement Learning on Visual Attention”	<b>June 2015</b>
<b>Google DeepMind, London, England</b> “Multiple Object Recognition with Visual Attention”	<b>Dec 2014</b>
<b>University of Toronto Machine Learning Group</b> “Model Compression and Neural Networks”	<b>Dec 2013</b>
<b>Microsoft Research, Redmond, WA</b> “Do Deep Nets Really Need to be Deep?”	<b>Nov 2013</b>

**TEACHING EXPERIENCE**


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<b>ECE521 Inference Algorithms and Machine Learning</b> Course instructor and coordinator, University of Toronto	<b>2017</b>
<b>ECE521 Inference Algorithms and Machine Learning</b> Head TA and guest lecturer, University of Toronto	<b>2016</b>
<b>ECE521 Inference Algorithms and Machine Learning</b> Guest lecturer on inference algorithms and message-passing, University of Toronto	<b>2015</b>
<b>ECE521 Inference Algorithms and Machine Learning</b> Head TA, designed two new assignments, 7 weeks of tutorial sessions, University of Toronto	<b>2015</b>
<b>CSC2523 Deep Learning in Computer Vision</b> Guest lecturer on neural programming, University of Toronto	<b>2015</b>
<b>CSC321 Introduction to Neural Networks and Machine Learning</b> Guest lecturer on probability theory and inference algorithms, University of Toronto	<b>2014</b>
<b>CSC321 Introduction to Neural Networks and Machine Learning</b> Tutorial TA, 4 weeks of tutorial sessions and lecture assistant, University of Toronto	<b>2014</b>
<b>ECE1510/CSC2535 Advanced Inference Algorithms/Advanced Machine Learning</b> Guest lecturer on deep learning, University of Toronto	<b>2014</b>
<b>ECE521 Inference Algorithms and Machine Learning</b> Guest lecturer on neural networks and deep learning, University of Toronto	<b>2013</b>
<b>ECE521 Inference Algorithms and Machine Learning</b> Head TA, 6 weeks of tutorial sessions, University of Toronto	<b>2013</b>

**Jimmy L. Ba**[jba@cs.toronto.edu](mailto:jba@cs.toronto.edu)**REVIEW AND SERVICE**

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**Conference Reviewer**

Neural Information Processing Systems (NIPS)	2017
International Conference on Learning Representations (ICLR)	2017
International Conference on Machine Learning (ICML)	2016
European Conference on Computer Vision (ECCV)	2016
IEEE Conference on Computer Vision and Pattern Recognition (CVPR)	2016
International Conference on Learning Representations (ICLR)	2016
International Conference on Machine Learning (ICML)	2015
International Conference on Learning Representations (ICLR)	2015
IEEE Conference on Computer Vision and Pattern Recognition (CVPR)	2013
IEEE Conference on Computer Vision and Pattern Recognition (CVPR)	2012

**INDUSTRY EXPERIENCE**

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<b>Research Intern</b>	2014
Google Deepmind, London, England	
<b>Research Intern</b>	2013
Microsoft Research, Redmond, Washington	
<b>Software Development Engineer</b>	2009
Sybase iAnywhere Inc., Waterloo, Ontario	