

ROLAND MEMISEVIC

CURRICULUM VITAE

EDUCATION

Computer Science, PhD Sep. 2003 – Mar. 2008
University of Toronto, Department of Computer Science
Adviser: Prof. Geoffrey Hinton
Thesis title: *Non-linear latent factor models for revealing structure in high-dimensional data*

Computer Science, Diplom (with distinction) Apr. 1997 – Apr. 2003
German equivalent of combined B.Sc./M.Sc.
Department of Computer Science, Bielefeld University, Bielefeld/Germany.
Advisers: Prof. Helge Ritter and Dr. Peter Meinicke
Thesis title: *Unsupervised Kernel Regression for Nonlinear Dimensionality Reduction*

PROFESSIONAL EXPERIENCE

Qualcomm AI Research since July 2021
Sr. Director

Twenty Billion Neurons June 2016 – June 2021
Co-founder, Chief Scientist (2016-2018), CEO (2018-2021)

**Department of Computer Science and Operations Research,
University of Montreal, Canada** Sep 2012 – May 2020
(adjunct 2016-2020)
Assistant/adjunct Professor at MILA (Montreal Institute for Learning Algorithms)

Department of Computer Science, University of Frankfurt Jan. 2011 – Aug. 2012
Juniorprofessor

Department of Computer Science, ETH Zürich, Switzerland Jan. 2010 – Dec. 2010
Postdoctoral fellow

PNYLab LLC, Princeton, USA Jul. 2008 – Dec. 2009
Research scientist

Department of Computer Science, University of Toronto, Canada Jan. 2008 – Jun. 2008
Postdoctoral fellow

Microsoft Research, Redmond, USA Jun. 2007 – Sep. 2007
Research intern

Department of Computer Science, Bielefeld University, Germany Apr. 2003 – Oct. 2003
Research assistant

PUBLICATIONS	
Bhattacharyya, A., Xu, B., (5 additional authors), Sigal, L., Memisevic, R. Can Multi-Modal LLMs Provide Live Step-by-Step Task Guidance? Neurips 2025	2025
Ebrahimi, R., Memisevic, R. Revisiting Bi-Linear State Transitions in Recurrent Neural Networks Neurips 2025	2025
Khisti, A., Ebrahimi, R., Dbouk, H., Behboodi, A., Memisevic, R., Louizos C. Multi-Draft Speculative Sampling: Canonical Decomposition and Theoretical Limits ICLR 2025	2025
Phan, B., Ebrahimi, R., Haresh, S., Memisevic, R. Delayed Attention Training Improves Length Generalization in Transformer-RNN Hybrids Neurips Workshop on what transformers can(t) do	2025
Haresh, S. Dijkman, D., Bhattacharyya, A., Memisevic, R. ClevrSkills: Compositional Language and Visual Reasoning in Robotics Neurips 2024	2024
Ebrahimi, R., Panchal, S., Memisevic, R. Your context is not an array: Unveiling random access limitations in transformers COLM 2024	2024
Panchal, S., Bhattacharyya, A., Berger, G., (8 additional authors), Memisevic, R. Live Fitness Coaching as a Testbed for Situated Interaction Neurips 2024	2024
Dagli, R., Berger, G., Materzysnka, J., Bax. I., Memisevic, R. AirLetters: An Open Video Dataset of Characters Drawn in the Air ECCV Hands workshop 2024	2024
Bhattacharyya, A., Panchal S., Pourreza, R., Lee, M., Madan, P., Memisevic, R. Look, Remember and Reason: Grounded Reasoning in Videos with Language Models ICLR 2024	2024
Ling, Z., Fang, X., Li, X., Mu, T., Lee, Memisevic, R., Su, H. Deductive Verification of Chain-of-Thought Reasoning Neurips 2023	2023
Pourreza, R., Bhattacharyya, A., Panchal, S., Lee, M., Madan, P., Memisevic, R. Painter: Teaching Auto-regressive Language Models to Draw Sketches ICCV Workshops 2023	2023
Memisevic, R., Panchal, S., Lee, M. Decision making as language generation Neurips workshop on Foundation Models for Decision Making	2022
Mercier, A., Berger, G., Panchal, S., Letsch, F., Boehm, C., Bax, I. Memisevic, R. Does action recognition need pose estimation? Medium	2020
Materzysnka, J., Berger G., Bax, I., Memisevic, R. The jester dataset: A large-scale video dataset of human gestures ICCV workshop HANDS 2019	2019
Mahdisoltani, F., Berger, G., Gharbieh, W., Memisevic, R., Fleet, D. The more fine-grained, the better for transfer learning NeurIPS Workshop on Modeling and Decision-Making in the Spatiotemporal Domain	2018

- Goyal, R., Mahdisoltani, F., Berger, G., Gharbieh, W., Bax, I., Memisevic R. 2018
Evaluating visual “common sense” using fine-grained classification and captioning tasks
 ICLR workshop
- Ebrahimi Kahou, S., Michalski, V., Memisevic, R., Pal, C., Vincent, P. 2017
RATM: Recurrent attentive tracking model
 CVPR workshop BNMR
- Goyal, R., Kahou, S., Michalski, V., (9 additional authors), Memisevic, R. 2017
The ”something something” video database for learning and evaluating visual common sense
 International Conference on Computer Vision (ICCV 2017)
- Berger, G., Memisevic, R. 2017
Incorporating long-range consistency in CNN-based texture generation
 International Conference on Learning Representations (ICLR 2017)
- Lin, Z., Courbariaux M., Memisevic, R., Bengio Y. 2016
Neural Networks with Few Multiplications
 International Conference on Learning Representations (ICLR 2016)
- Krueger, D., Memisevic, R. 2016
Regularizing RNNs by Stabilizing Activations
 International Conference on Learning Representations (ICLR 2016)
- Im, D., Belghazi, M., Memisevic, R. 2016
Conservativeness of Untied Auto-Encoders
 Thirtieth AAAI Conference on Artificial Intelligence (AAAI 2016)
- de Vries, H., Memisevic, R., Courville, A. 2016
Deep Learning Vector Quantization
 European Symposium on Artificial Neural Networks (ESANN 2016)
- Zhang,S., Wu,Y., Che,T., Lin,Z., Memisevic,R., Salakhutdinov,R., Bengio,Y. 2016
Architectural Complexity Measures of Recurrent Neural Networks
 Neural Information Processing Systems (NIPS 2016).
- Kamyshanska, H., Memisevic, R. 2015
The potential energy of an autoencoder
 IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI).
- Konda, K., Memisevic, R., Krueger, D. 2015
Zero-bias autoencoders and the benefits of co-adapting features
 International Conference on Learning Representations (ICLR 2015).
- Konda, K., Memisevic, R. 2015
Learning visual odometry with a convolutional network
 International Conference on Computer Vision Theory and Applications (VISAPP 2015).
- Jean, S., Cho, K., Memisevic, R., Bengio, Y. 2015
On using very large target vocabulary for neural machine translation
 Annual meeting of the Association for Computational Linguistics (ACL 2015).
- Konda, K., Chandrasekariah, P., Memisevic, R., Triesch, J. 2015
Real-time activity recognition via deep learning of motion features
 European Symposium on Artificial Neural Networks (ESANN2015)
- Michalski V., Memisevic R., Konda K. 2014
Modeling Deep Temporal Dependencies with Recurrent “Grammar Cells”
 Neural Information Processing Systems (NIPS 2014).

- Konda K., Memisevic, R., Michalski V. 2014
Learning to encode motion using spatio-temporal synchrony
International Conference on Representation Learning (ICLR 2014).
- Konda K., Memisevic R. 2014
A unified approach to learning depth and motion features
Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP 2014).
- Memisevic, R. 2013
Learning to relate images
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) Special issue on Learning Deep Architectures 2013.
- Kamyshanska, H., Memisevic, R. 2013
On autoencoder scoring
International Conference on Machine Learning (ICML 2013).
- Memisevic, R., Exarchakis, G. 2013
Learning invariant features by harnessing the aperture problem
International Conference on Machine Learning (ICML 2013).
- Bauer, F., Memisevic, R. 2013
Feature grouping from spatially constrained multiplicative interaction
International Conference on Representation Learning (ICLR 2013).
- Memisevic, R., Sigal L., Fleet, D. 2012
Shared Kernel Information Embedding for Discriminative Inference.
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI).
- Memisevic, R. 2012
On multiview feature learning
International Conference on Machine Learning (ICML 2012).
- Memisevic, R. 2012
On spatio-temporal feature learning
The Learning Workshop, Snowbird.
- Memisevic, R. 2011
Gradient-based learning of higher-order image features.
International Conference on Computer Vision (ICCV 2011).
- Susskind, J., Memisevic, R., Hinton, G., Pollefeys M. 2011
Modeling the joint density of two images under a variety of transformations.
International Conference on Computer Vision and Pattern Recognition (CVPR 2011).
- Memisevic, R. 2011
On spatio-temporal sparse coding: Analysis and an algorithm.
NIPS workshop on deep learning and unsupervised feature learning.
- Memisevic, R., Conrad C. 2011
Stereopsis via deep learning.
NIPS workshop on deep learning and unsupervised feature learning.
- Memisevic, R., Hinton, G. 2010
Learning to Represent Spatial Transformations with Factored Higher-Order Boltzmann Machines.
Neural Computation. Vol. 22, No. 6: 1473-1492.
- Memisevic, R., Zach, C., Hinton, G., Pollefeys M. 2010
Gated Softmax Classification.
Neural Information Processing Systems (NIPS 2010).

Sigal, L., Memisevic, R., Fleet, D. 2009
Shared Kernel Information Embedding for Discriminative Inference.
International Conference on Computer Vision and Pattern Recognition (CVPR) 2009.

Memisevic, R., Hinton, G. E. 2007
Unsupervised learning of image transformations.
International Conference on Computer Vision and Pattern Recognition (CVPR) 2007.

Samulowitz, H., Memisevic, R. 2007
Learning to solve QBF.
Twenty-Second Conference on Artificial Intelligence (AAAI) 2007.

Memisevic, R. 2006
Kernel Information Embeddings.
International Conference on Machine Learning (ICML) 2006.

Memisevic, R. 2006
Propagating Errors and Beliefs for Large Scale Nonlinear Structure Prediction.
North East Student Colloquium on Artificial Intelligence. Ithaca, NY.

Meinicke, P., Klanke, S., Memisevic, R., Ritter, H. 2005
Principal Surfaces from Unsupervised Kernel Regression.
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), Sep. 2005.

Memisevic, R. and Hinton, G. E. 2005
Improving dimensionality reduction with spectral gradient descent.
Neural Networks, 18, pp 702-710.

Memisevic, R., Srebro N., Roweis, S. 2005
Exploring the regularization path for adaptive Gaussian kernel SVMs.
NIPS Workshop on the Accuracy-Regularization Frontier.

Memisevic, R. 2005
Dual Optimization of Conditional Probability Models.
NIPS Workshop on Kernel Methods for Structured Domains.

Memisevic, R. and Hinton, G. E. 2005
Embedding via clustering: Using spectral information to guide dimensionality reduction. International Joint Conference on Neural Networks 2005.

Memisevic, R. and Hinton, G. E. 2005
Multiple Relational Embedding.
Neural Information Processing Systems (NIPS) 2005.

THESES

Memisevic, R. 2008
Non-linear latent factor models for revealing structure in high-dimensional data.
PhD Thesis, Department of Computer Science, University of Toronto.

Memisevic, R. 2003
Unsupervised Kernel Regression for Nonlinear Dimensionality Reduction.
Master's thesis, Department of Computer Science, Bielefeld University.

GRANTS AND AWARDS

FQRNT Team Research Project: Unsupervised deep learning of changes in facial expression 2015
≈ \$150,000 CAD four three years. Team leader, with co-PIs Yoshua Bengio, Pascal Vincent, Aaron Courville.

DARPA seedling project	2015
≈ \$180,000 USD for one year for studying Deep Learning based time series models (PI) jointly with Yoshua Bengio (co-PI). Part of a larger project with SRI and University of Guelph.	
Facebook	2014
\$25,000 USD, gift	
Google faculty research award	2013
\$40,800 USD for studying phase-sensitive feature hierarchies.	
NSERC Discovery Grant	2013
\$100,000 CAD (\$20,000 per year for five years 2013–2018) Research Grant.	
NSERC Strategic Grant	2013
\$575,739 CAD (\$191,913 per year for three years) Strategic Project Grant in collaboration with Ubisoft (jointly with Yoshua Bengio, Pascal Vincent and Aaron Courville)	
Government of Canada Award	2003
Funding for the first two years of my PhD program at Toronto (> \$50,000 CAD in total)	

PROFESSIONAL ACTIVITIES

Regular reviewer and/or PC member for conferences ICLR, NIPS, ICML, CVPR, ICCV, ECCV, DAGM

Reviewer for Swiss National Science Foundation, Journal IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), Journal of Machine Learning Research (JMLR), Journal Image and Vision Computing (IMAVIS), Journal Constraint, Journal Machine Learning, IEEE Transactions on Image Processing, International Journal of Adaptive Control and Signal Processing.

Co-organizer for CRM/CIFAR Summer School on Deep Learning in Montreal 2015 (with Yoshua Bengio, Yann LeCun)

Co-organizer for NIPS 2014 workshop on Deep Learning and Representation Learning (with Adam Coates, Yoshua Bengio, Andrew Ng)

Invited tutorial on Deep Learning at *Hotchips* (Cupertino, CA) 2015

Invited tutorial on Deep Learning in Image Processing and Vision at International Conference on Image Processing *ICIP* (Quebec City) 2015

Invited tutorial at Training Workshop on Deep Architectures in Vision and NL (Wroclaw, Poland) 2015

Invited tutorial at the *CIFAR Summer School Neural Computation and Adaptive Perception (NCAP)* Toronto 2013

Tutorial at CVPR 2012: *Multiview feature learning*

Invited tutorial at the *IPAM Graduate Summer School: Deep Learning, Feature Learning* (UCLA) 2012

Invited tutorial at DAGM 2011: *Higher-order feature learning: Building a computer vision “swiss army knife”*

GRADUATE STUDENT SUPERVISION

Zhouhan Lin (PhD student at University of Montreal, from 2014)

Vincent Michalski (PhD student at University of Montreal, from 2015)

Harm de Vries (PhD student at University of Montreal, from 2014) jointly with Aaron Courville

Kyle Kastner (MSc student at University of Montreal, from 2014) jointly with Yoshua Bengio

David Krueger (MSc student at University of Montreal, from 2013) jointly with Yoshua Bengio
 Kishore Konda (University of Frankfurt) PhD received 2015
 Sebastien Jean (University of Montreal) MSc received 2015
 Vincent Michalski (University of Frankfurt) MSc received 2014
 Irina Shelegeda (University of Frankfurt) MSc received 2014
 Hanna Kamyshanska (University of Frankfurt) MSc received 2013
 Felix Bauer (University of Frankfurt) MSc received 2012

TEACHING

Instructor, <i>Machine Learning for Vision (IFT 6268)</i> University of Montreal	Winter 2016
Instructor, <i>Databases (IFT2821)</i> University of Montreal	Winter 2015
Instructor, <i>Machine Learning for Vision (IFT 6268)</i> University of Montreal	Winter 2015
Instructor, <i>Fundamentals of Machine Learning</i> University of Montreal	Fall 2014
Instructor, <i>Machine Learning for Vision (IFT 6268)</i> University of Montreal	Fall 2013
Instructor, <i>Topics in artificial intelligence (IFT 6085): Visual Feature Learning</i> University of Montreal	Winter 2013
Instructor, <i>Machine Learning</i> University of Frankfurt	Winter 2011/12
Instructor, <i>Digital Image Processing</i> University of Frankfurt	Spring 2011
Teaching Assistant, <i>Introduction to Neural Networks and Machine Learning (CSC 321)</i> University of Toronto	Spring 06/07
Teaching Assistant, <i>Software Design (CSC 207)</i> , University of Toronto	Summer 2006
Teaching Assistant, <i>Machine Learning (CSC 2515)</i> , University of Toronto	Fall 2005 and 2006
Teaching Assistant, <i>Theoretical Computer Science</i> , Bielefeld University	Summer 2000
Teaching Assistant, <i>Methods of Artificial Intelligence</i> , Bielefeld University	Winter 1999/2000