Geoffrey E. Hinton

Department of Computer Science

University of Toronto
6 King's College Rd.
Toronto, Ontario

email: geoffrey [dot] hinton [at] gmail [dot] com

voice: send email

fax: scan and send email

BIOGRAPHICAL INFORMATION
.....Curriculum Vitae .pdf
.....Biographical sketch
.....Brief Bio
.....Photographs

PUBLICATIONS
.....Publications by year
.....Slides of public talks

MEDIA INTERVIEWS
.... CBS 60 Minutes, Sept 2023
.... Interview at Collision Conference, Toronto, June 2023
.... CNN Amanpour and Company, May 2023
.... PBS, May 2023
.... BBC News, May 2023
.... CNN Jake Tapper, May 2023
.... CBC The National, May 2023
.... CBS Morning News, March 2023
.... Interview on CBC radio "The Current", May 5 2015

VIDEO LECTURES
....YouTube (Feb 2024) The Romanes Lecture (40mins)
....YouTube (Dec 2023) The Arthur Miller Lecture on Science and Ethics (1.13hr)
....YouTube (May 2023) Two Paths to Intlligence (1hr)
....YouTube (2012) Brains, Sex and Machine Learning (1hr)
....YouTube (2007) The Next Generation of Neural Networks (1hr)
....YouTube (2010) Recent Developments in Deep Learning (1hr)

TUTORIALS
....Tutorial (2009) Deep Belief Nets (3hrs) ppt pdf readings
....Workshop Talk (2007) How to do backpropagation in a brain (20mins) ppt2007 pdf2007 ppt2014 pdf2014

Information for prospective students, postdocs and visitors:
I will not be taking any more students, postdocs or visitors.

Basic papers on deep learning

LeCun, Y., Bengio, Y. and Hinton, G. E. (2015)
Deep Learning
Nature, Vol. 521, pp 436–444. [pdf]

Hinton, G. E., Osindero, S. and Teh, Y. (2006)
A fast learning algorithm for deep belief nets.
Neural Computation, **18**, pp 1527–1554. [pdf]
Movies of the neural network generating and recognizing digits

Hinton, G. E. and Salakhutdinov, R. R. (2006)
Reducing the dimensionality of data with neural networks.
Science, Vol. 313. no. 5786, pp. 504 – 507, 28 July 2006.
[full paper] [supporting online material (pdf)] [Matlab code]

Recent Papers

Hinton, G. E. (2022)
The Forward–Forward Algorithm: Some Preliminary Investigations
arXiv:2212.13345
[pdf of final version]
[ffcode.zip matlab code for the supervised version of FF with the first 10 pixels being the labels]
[load mnistdata.mat in matlab to create the data]

2012 COURSERA COURSE LECTURES:
Neural Networks for Machine Learning

....Lectures(.mp4)

....Lecture Slides(.pptx or .pdf))

OLD UNIVERSITY OF TORONTO COURSES

....csc321 Spring 2013(undergrad)

....csc2535 Spring 2013(graduate)

OLD TUTORIAL SLIDES

....2011 NIPS workshop talk pdf ppt
.....paper on Transforming Autoencoders

....2007 NIPS tutorial html ppt ps pdf
.....Readings: 2007 NIPS tutorial

....CIFAR Summer School 2007

....CIAR Summer School 2006

....CIFAR Summer School 2005

....List of Past Tutorials

MOVIES

....generating digits

....speaking with a glove (Sidney Fels)

MATLAB CODE

.... Matlab for Science paper

....t-SNE software

....trajectory from motor program

....ink from trajectory

....introduction to python

SUPERVISION

....Current PhD and Master's Students

....Former PhD Students

....Former Master's Students

....PostDocs

MACHINE LEARNING AT TORONTO

....learning.cs.toronto.edu

HOME PAGE (top level)

....www.cs.toronto.edu/~hinton

[README.txt explains what to do to run FF}
Sindy Loewe's translation to python code is available at https://github.com/loeweX/Forward-Forward

Chen, T., Zhang, R., & Hinton, G. (2022)
Analog bits: Generating discrete data using diffusion models with self-conditioning
arXiv preprint arXiv:2208.04202 [pdf]

Ren, M., Kornblith, S., Liao, R., & Hinton, G. (2022)
Scaling Forward Gradient With Local Losses
arXiv preprint arXiv:2210.03310 [pdf]

Chen, T., Saxena, S., Li, L., Lin, T. Y., Fleet, D. J., & Hinton, G. (2022)
A unified sequence interface for vision tasks
arXiv preprint arXiv:2206.07669 [pdf]

Chen, T., Li, L., Saxena, S., Hinton, G., & Fleet, D. J. (2022)
A generalist framework for panoptic segmentation of images and videos
arXiv preprint arXiv:2210.06366 [pdf]

Liao, R., Kornblith, S., Ren, M., Fleet, D. J., & Hinton, G. (2022)
Gaussian-Bernoulli RBMs Without Tears
arXiv preprint arXiv:2210.10318 [pdf]

Culp, L., Sabour, S., & Hinton, G. E. (2022)
Testing GLOM's ability to infer wholes from ambiguous parts
arXiv preprint arXiv: 2211.16564 [pdf]

Agarwal, R., Melnick, L., Frosst, N., Zhang, X., Lengerich, B., Caruana, R., & Hinton, G. E. (2021)
Neural additive models:Interpretable machine learning with neural nets
Advances in Neural Information Processing Systems, 34, 4699-4711. [pdf]

Bengio, Y., Lecun, Y., & Hinton, G. (2021)
Deep learning for AI
Communications of the ACM, 64(7), 58-65. [pdf]

2021 commencement address at IIT Mumbai

Joseph Turian's map of 2500 English words produced by using t-SNE on the word feature vectors learned by Collobert & Weston, ICML 2008

Doing analogies by using vector algebra on word embeddings (in 2008)

My old favorite Gary Marcus quote

GPT-4 corrects Gary Marcus

My new favorite Gary Marcus quote
"It gloms on to different clusters of text. That is all."

A new concept of healing from the people who design unimprovised explosive devices