Chris Olah

"I want to understand things clearly and explain them well."

Work Experience

May - Sep., 2015
Host: Greg Corrado

Google Research, Intern.
- Visualized the 'platonic ideal' of classes according to convolutional neural networks.
- Developed other novel techniques for visualizing neural networks.

July - Oct, 2014
Host: Jeff Dean

Google Research, Intern.
- Explored the use of interactive media for visualizing neural networks representations with dimensionality reduction.
- Created the meta-SNE algorithm, which can visualize the space of neural networks.

July - Sep, 2011

Xelerance, Intern.
- Implemented DNSSEC verification tool
- Worked on open-source DNS libraries

July - Nov, 2010

Environment Canada, Research Assistant.
- Developed visualization tools in Python
- Reverse engineered proprietary data format

July - Aug, 2009

University of Toronto, *Dept. of Forestry*, Research Assistant.
- Developed C++ tool for modeling and visualizing small ecosystems

Honours

July 2012
Thiel Fellowship.
$100,000 Fellowship that supports exceptional people under the age of 20 pursue research or start companies.

July 2010
AP National Scholar.
Graduated high school with six AP (university equivalent) credits.

Published Security Vulnerabilities

May 2011
Unbound DNS Resolver DDOS Vulnerability.
CVE-2011-1922 / VU#531342

Review Service

2014   **International Conference on Learning Representations**.

2014   **Neural Information Processing Systems Deep Learning Workshop**.

Selected Open Source Participation

2011 - 2013	**ImplicitCAD**, Founder.
	implicit.herokuapp.com – *A programming language that compiles into 3D objects, written in Haskell*
	○ Implemented geometry engine (primitives, CSG, etc), interpreter, & GCode generation
Jan - Feb, 2013	**Printrun**, Contributor.
	github.com/kliment/Printrun – *Pure Python 3d printing host software*
	○ Added safety checks and improved CLI interface
May - March, 2011	**Printable Vacuum Cleaner**, Author.
	github.com/colah/Printable-Vacuum-Cleaner
	A Hand Held 3D printable vacuum cleaner!
May - Sep., 2011	**surfcad**, Author.
	github.com/colah/surfcad/ – *Surface-Oriented Programmatic CAD*
May - Jan., 2011	**ldnsx**, Author.
	github.com/colah/ldnsx/ – *A better Python ldns interface*
March - Sep., 2011	**OpenSCAD**, Contributor.
	www.openscad.org – *Programmatic 3D CAD*
	○ Implemented syntax highlighting and language extensions
2010 - 2011	**Malthus RepRap**, Core Developer.
	github.com/hacklabto/Hacklab-RepRap
	An open-source 3D printer striving for self-replication, derived from the Prusa Mendel
	○ Redesigned parts to reduce print time and increase ease of assembly
2009 - 2010	**Sage**, Contributor.
	www.sagemath.org – *Open-Source Mathematics Software*
	○ Added support for exporting 3D visualizations as STLs for 3D printing

Leadership

2009 - 2014	**hacklab.to**, Member & Director.
	A hackerspace (community technology space) in Toronto
	○ Oversaw management of corporation as a Director (Feb 2012 - Feb 2014).
	○ Helped maintain the safety and functionality of the physical space.
2012 - 2013	**DIY Bio Toronto**, Co-Organizer.
	Biology enthusiasts looking to start a biohackerspace
	○ Organized several meetups.
	○ Started the Molecular Biology of the Cell (Alberts, *et al.*) study group.
2012 - 2013	**Toronto Haskell Meetup**, Organizer.
	Haskell enthusiasts
	○ Organized monthly meetups.
2011 - 2012	**Toronto 3D Printers**, Organizer.
	3D Printing Enthusiasts
	○ Organized the group while it grew from a handful of people to 40+.

Volunteering

2010 - 2012 **Free Byron**, Court Supporter.
Documenting the trial of security researcher Byron Sonne
○ Attended court daily, took notes, and published where legally able.
○ Read case law and discussed case with lawyers to better understand legal arguments

Feb. - Sep., 2010 **Fort York Food Bank**, Volunteer.
○ Distributed food to clients

Writing

Aug. 31, 2015
8,000+ views
Calculus on Computational Graphs: Backpropagation, colah.github.io.

Aug. 27, 2015
20,000+ views
Understanding LSTM Networks, colah.github.io.

June 17, 2015
1,700,000+ views
Inceptionism: Going Deeper into Neural Networks, Google Research Blog.
Alexander Mordvintsev, Christopher Olah, & Mike Tyka.

Jan. 16, 2015
45,000+ views
Visualizing Representations: Deep Learning and Human Beings,
colah.github.io.

Dec. 2014
4 citations
Document Embedding with Paragraph Vectors, NIPS Deep Learning Workshop. Andrew M Dai, Christopher Olah, Quoc V Le, & Greg S Corrado.

Dec. 8, 2014
7,000+ views
Groups & Group Convolutions, colah.github.io.

Oct. 9, 2014
33,000+ views
Visualizing MNIST: An Exploration of Dimensionality Reduction,
colah.github.io.

July 13, 2014
19,000+ views
Understanding Convolutions, colah.github.io.

July 8, 2014
17,000+ views
2 citations
Conv Nets: A Modular Perspective, colah.github.io.

July 7, 2014
81,000+ views
Deep Learning, NLP, and Representations, colah.github.io.

July 6, 2014
16,000+ views
Fanfiction, Graphs, and PageRank, colah.github.io.

April 6, 2014
128,000+ views
Neural Networks, Manifolds, and Topology, colah.github.io.

In Progress
A Weird, Motivated, Intuitive, Introduction to Topology.,
github.com/colah/.

July 16, 2013
500+ views
Order Statistics, colah.ca.

June 9, 2013
500+ views
How My Neural Net Sees Blackboards (Part 2), colah.ca.

May 29, 2013
250+ views
I'm Sick and Tired of 3D Printed Guns, colah.ca.

May 11, 2013
500+ views
How My Neural Net Sees Blackboards, colah.ca.

June 17, 2012
Monads for the Terrified, colah.ca.

Feb 10, 2012
Quantified Hacklab (Part 1), colah.ca.

Nov 6, 2011
2,000+ views
Manipulation of Implicit Functions (With an Eye on CAD), colah.ca.

Nov 1, 2011	**Producing Lenses with 3D Printers**, Open Hardware Journal.
Aug 29, 2011 10,000+ views	**Understanding Pascal's Triangle**, colah.ca.
Aug. 11, 2011 250+ views	**You Already Know Calculus: Differential (One) Forms**, colah.ca.
Aug. 8, 2011 15,000+ views	**The Real 3D Mandelbrot Set**, colah.ca.
July 31, 2011 500+ views	**You Already Know Calculus: Derivatives**, colah.ca.
July 16, 2011 500+ views	**Surface-Oriented CAD, Math, & Telescopes**, colah.ca.
June 6, 2011 1,000+ views	**Alien Mathematics, Numbers, and Polynomial Centric Societies**, colah.ca.
April 18, 2011 1,000+ views	**Rethinking Topology (or a Personal Topologodicy)**, colah.ca.
March 28, 2011 2,000+ views	**Rethinking Grade School Algebra**, colah.ca.
July 8, 2010	**Towards a Better Notation for Mathematics**, colah.ca.

Talks

Feb 10, 2015	**Neural Networks and the Structure of Data**, Intersections KW.
Nov 17, 2014	**Why Pattern Recognition is Hard, and Why Deep Neural Networks Help**, Waterloo Computer Science Club.
Jan. 24, 2014	**Visualizing the Space of Neural Network Hyper-Parameters**, Google.
Sep 30, 2013	**Smart Kids Are Doing it for Themselves**, Equinox Summit: Learning 2030, Perimeter Institute. Invited Panelist..
July 12, 2013	**3D Printing For Mathematical Visualization**, Canadian Undergraduate Math Conference.
Nov. 17, 2012	**Constructive Ways to Build a Better Future**, TEDxYouth@Toronto.
Oct. 13, 2012	**Multiplicative Calculus For Analyzing Exponential Trends**, Singularity Summit.
April 18, 2012	**3D Printing & ImplicitCAD**, Noisebridge.
Nov. 8, 2011	**Open Source 3D Printing: The Printers, Toolchain, & Things**, Greater Toronto Area Linux User Group.
Oct. 1, 2011	**3D Printing Awesome Things**, SoOnCon.
Sep. 17, 2011	**Programmatic CAD and its Future**, NYC Maker Faire.

Teaching

I've taught two small seminar series on neural networks, one online and one in person. I've also taught many different workshops at hacklab.to on topics ranging from Integral Transforms to LaTeX.