

24th Vienna



Deep Learning

Meetup

28th February 2019 @ T-Mobile



Vienna Deep Learning Meetup

The Organizers:



René Donner
contextflow



Thomas Lidy
Musimap



Alex Schindler
AIT & TU Wien



Jan Schlüter
OFAI & UTLN



Vienna Deep Learning Meetup

Agenda:

- Welcome by Organizers and Host
- Deep Learning for Ophthalmology - Diagnosis and Treatment of Eye Disorders
by Hrvoje Bogunovic (Medical University Vienna)
- <Networking & Pizza> 30 min
- Computer Vision Annotation Tool - by Alexander Hirner (moonvision.io)
- Interesting Papers & Hot Topics - by René Donner (contextflow)
- <More Networking and Discussions>

Announcements



WeAreDevelopers World Congress

WORLD'S LARGEST DEVELOPERS CONGRESS

CityCube Berlin

6 & 7 June

WeAreDevelopers World Congress Berlin



The legendary “Woodstock for Developers” is coming to Berlin on **June 6th and 7th!**

With **10,000 people**, more than **200 speakers** on various stages, the WeAreDevelopers World Congress 2019 is the largest of its kind. The CityCube at Messe Berlin will host workshops, talks, panel discussions and live coding sessions with top speakers. Deepen your knowledge about topics like **IoT, Blockchain, Gaming, Robotics & AI**. Experience the latest technologies live & network directly with local developers on the largest developer playground!



Latest confirmed Speakers



Håkon Wium Lee

Inventor of CSS
CTO of Opera Software



Basak Haznedaroglu

Director of Product Design
InVision



Sabria Lagoun

Ph.D. Candidate in Neuroscience
Medical University of Vienna



Dr. Dimitri De Jonghe

Co-founder & Protocol Design
Ocean Protocol

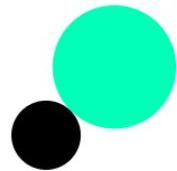


Svetlana Kouznetsova

Consultant, Author, Public Speaker



Technologies



Constructing Worlds

Building end-to-end Software Solutions



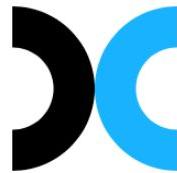
Controlling Complexity

Mastering ecosystems



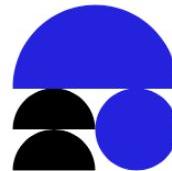
Applying Disruption

Emerging technologies



Unchaining Engineering

Hardware & Embedded Engineering



Coding Society

Principles, culture & responsibility

WeAreDevelopers

World Congress Berlin



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Vienna_DLM_25

>>> <https://events.wearedevelopers.com>

See you soon!

WeAreDevelopers

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Win a free ticket:
throw your name into the box!
(2 tickets to give away)

>>> <https://events.wearedevelopers.com>



See you soon!

VDLM on Github

<https://github.com/vdlm/meetups>

- all talks
- slides
- photos
- videos
- Wiki

Meetups						
#	Date	Place	Topic	Link	Video	Meetup.com
1	2016-04-07	Sector 5	intro	more		link
2	2016-05-09	Sector 5		more		link
3	2016-06-06	Sector 5		more		link
4	2016-07-07	TU Wien		more		link
5	2016-09-22	Automic Software GmbH		more		link
6	2016-10-12	Sector 5		more		link
7	2016-12-01	Agentur Virtual Identity		more		link
8	2017-01-17	TU Wien Informatik		more		link
9	2017-02-21	bwin.party services (Austria) GmbH		more		link

Talks				
Date	MU#	Speaker	Topic	Slides
2016-04-07	1	Thomas Lidy	An overview presentation of Deep Learning	pdf
2016-04-07	1	Jan Schlüter	History, Approaches, Applications	pdf
2016-05-09	2	Alex Champandard	Neural Networks for Image Synthesis	
2016-05-09	2	Gregor Mitscha-Baude	Recurrent Neural Networks	pdf
2016-06-06	3	Jan Schlüter	Open-source Deep Learning with Theano and Lasagne	pdf
2016-09-22	5	Josef Puchinger	Deep Learning & The Future of Automation	
2016-09-22	5	Christoph Körner	Going Deeper with GoogLeNet and CaffeJS	pdf

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vdlm / meetups

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No description, website, or topics provided.

49 commits 1 branch 0 releases 2 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

stlychief update photos Latest commit e2811e6 20 days ago

Logo more content 25 days ago

Meetups update photos 20 days ago

README.md fixes 21 days ago

README.md



Overview

Deep Learning is currently a big & growing trend in data analysis and prediction - and the main fuel of a new era of AI. Google, Facebook and others have shown tremendous success in pushing image, object & speech recognition to the next level.

But Deep Learning can also be used for so many other things! The list of application domains is literally endless.

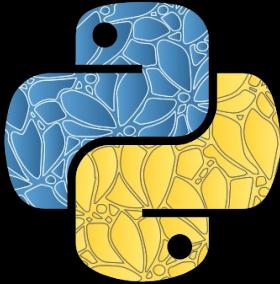
Although rooted in Neural Network research already in the 1950's, the current trend in Deep Learning is unstoppable, and new approaches and improvements are presented almost every month.



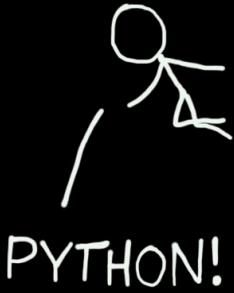
VDLM Youtube Channel

The screenshot shows the YouTube channel page for 'Vienna Deep Learning Meetup'. At the top, there's a video thumbnail of a meetup event with the caption 'Vienna Deep Learning Meetup'. Below it, the channel's logo and name 'Vienna Deep Learning Meetup' are displayed, along with the subscriber count '198 Abonnenten'. A navigation bar includes links for 'ÜBERSICHT', 'VIDEOS', 'PLAYLISTS', 'KANÄLE', 'DISKUSSION', and 'KANALINFO'. The 'ÜBERSICHT' tab is selected. The 'Uploads' section shows three video thumbnails: 'Ethics and Bias in Artificial Intelligence - 18th Vienna' (2:54:03), 'Ethics and Bias in Artificial Intelligence - 18th Vienna' (Keine Aufrufe · vor 4 Monaten gestreamt), and '17th Vienna Deep Learning Meetup (part 2):' (54:49). To the right, a 'BELIEBTE KANÄLE' section lists 'Kurzgesagt – In a Nuts...', '7-SEKUNDEN-RÄTSEL', and 'Dinge Erklärt – Kurzge...', each with a 'ABONNIEREN' button.

<https://www.youtube.com/ViennaDeepLearningMeetup>



PyDays Vienna



3 - 4 May 2019

Free Entry (Registration Required)

<https://www.pydays.at>

YOU'RE FLYING!
HOW?



- Call for Participation until 25 March 2019
- Hosted by Linuxwochen Wien
- Location: FH Technikum Wien



<https://www.xkcd.com/353/>



Mat Velloso

@matveloso

Follow



Difference between machine learning
and AI:

If it is written in Python, it's probably
machine learning

If it is written in PowerPoint, it's probably
AI

2:25 AM - 23 Nov 2018

8,234 Retweets 22,905 Likes



199



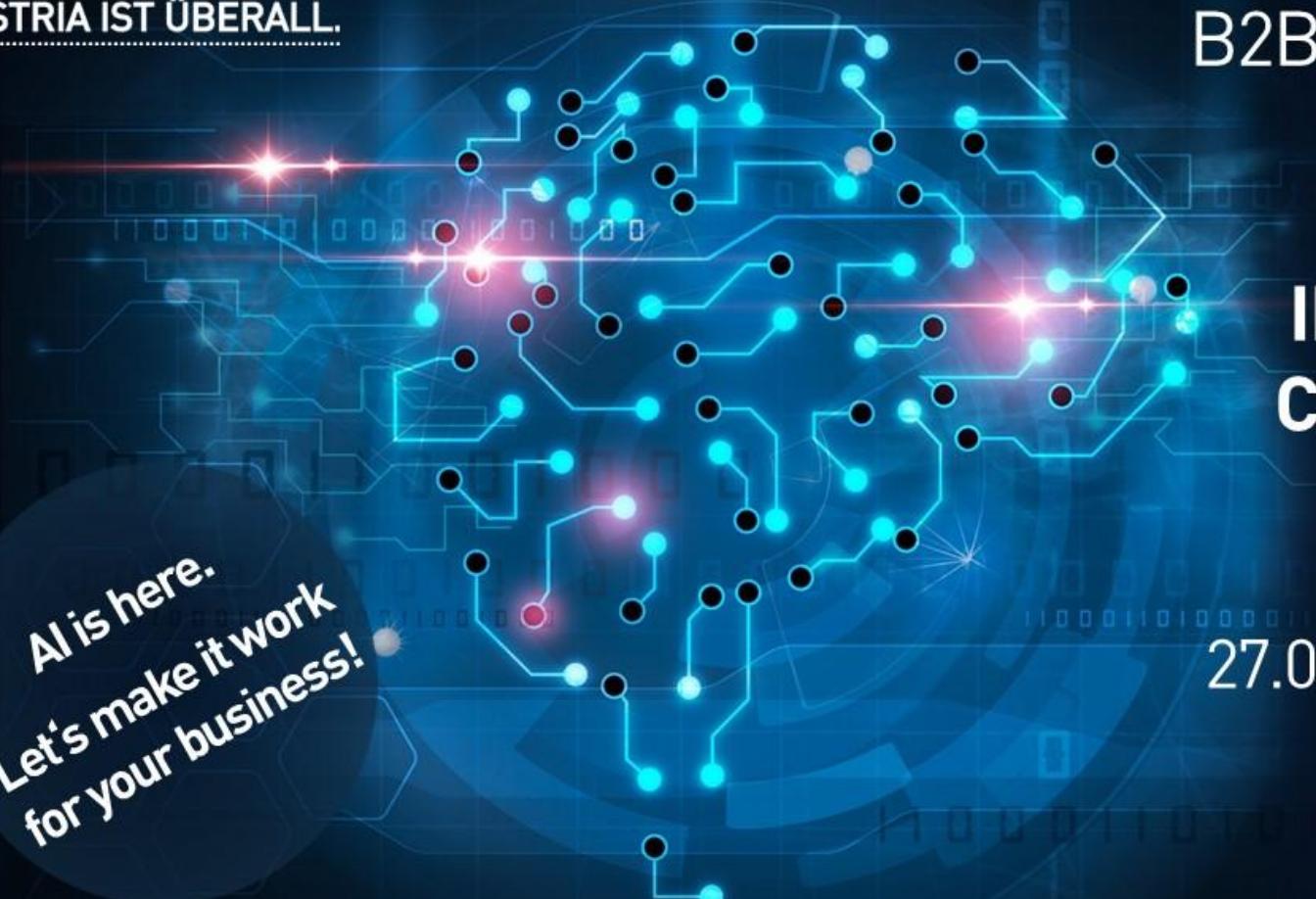
8.2K



23K



AUSTRIA IST ÜBERALL.



AI is here.
Let's make it work
for your business!

B2B PLATTFORM APPLIED ARTIFICIAL INTELLIGENCE CONFERENCE

VIENNA
27.05.2019 | 09-20h



Hot Topics & Latest News

a short block at every meetup
to briefly present recent papers and news

Send us contributions (tom.lidy@gmail.com)
or come with slides to do a short block yourself!

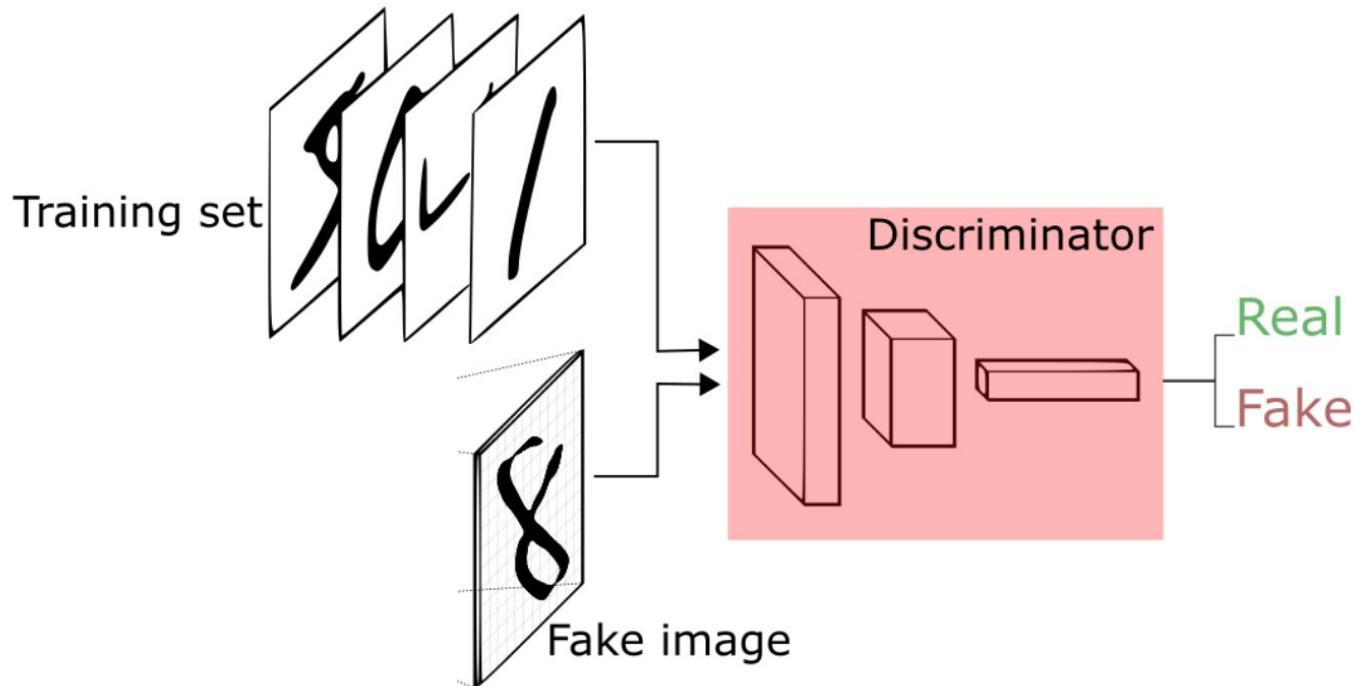
Hot Papers & DL News

GANs
Binary Networks

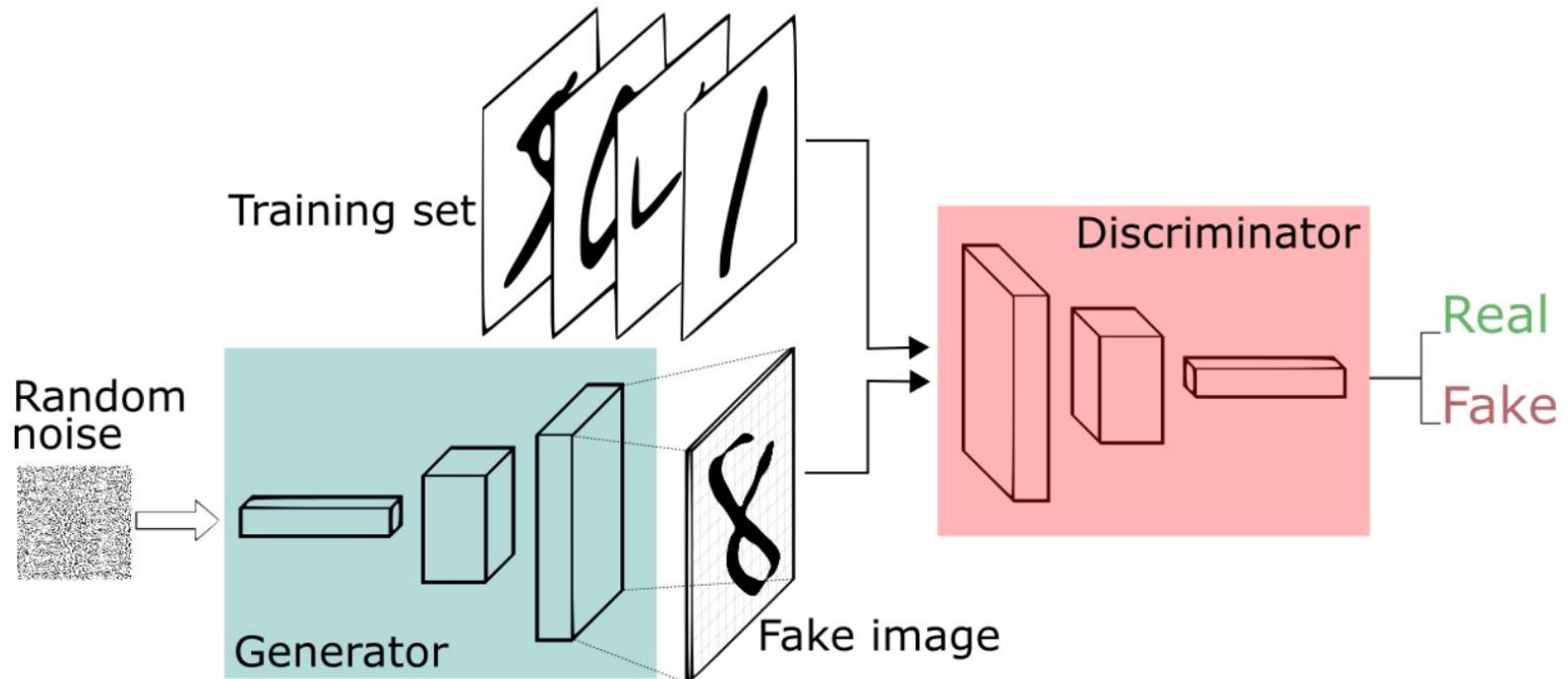
GAN DISSECTION: VISUALIZING AND UNDERSTANDING GENERATIVE ADVERSARIAL NETWORKS

**David Bau^{1,2}, Jun-Yan Zhu¹, Hendrik Strobelt^{2,3}, Bolei Zhou⁴,
Joshua B. Tenenbaum¹, William T. Freeman¹, Antonio Torralba^{1,2}**
¹Massachusetts Institute of Technology, ²MIT-IBM Watson AI Lab,
³IBM Research, ⁴The Chinese University of Hong Kong

GANS - Generative Adverserial Networks



GANS - Generative Adverserial Networks



Original

This bird has **wings that are blue** and has a **white belly**.

A small bird with **white base** and **black stripes** throughout its belly, head, and feathers.

Original

The petals of the flower have **yellow and red stripes**.

This flower has petals of **pink and white color** with **yellow stamens**.



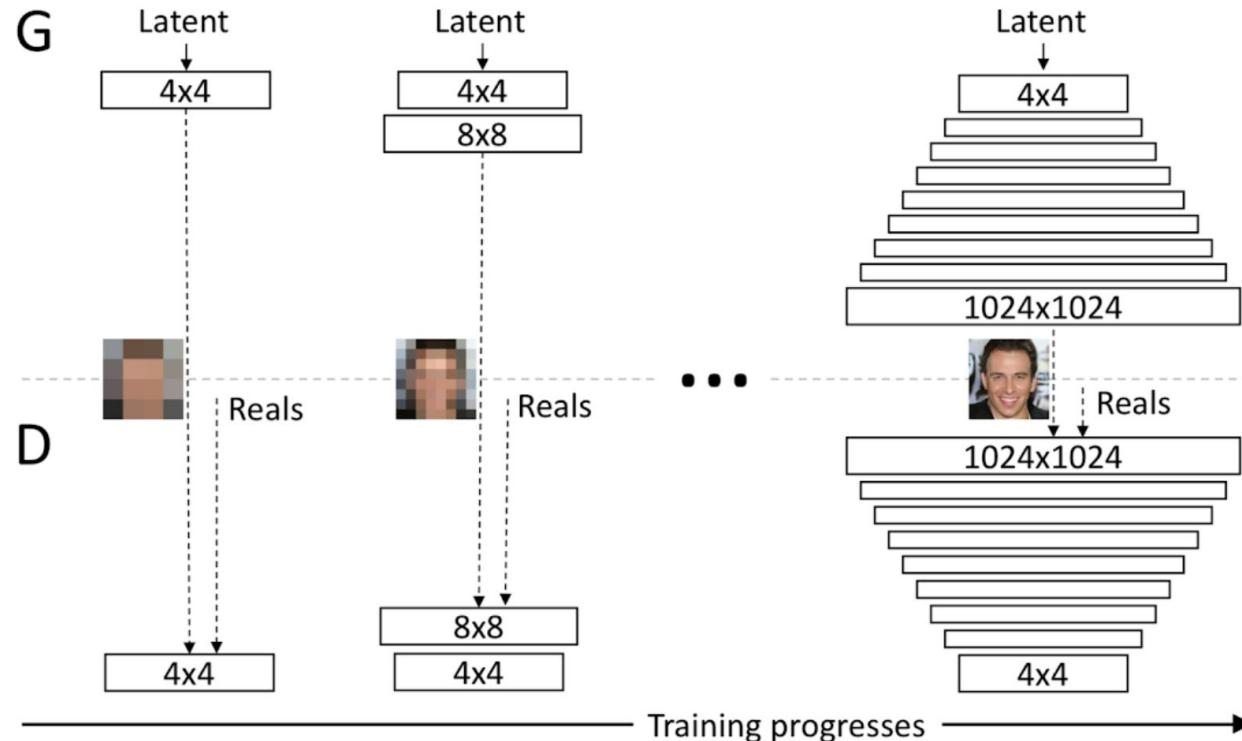


Left: A small **brightly colored yellow** bird with a **black crown**.
Right: This is a **black and white shaded** bird with a very small beak.



Figure 7: Sentence interpolation results. Our generator smoothly generates new visual attributes without loosing original image.

Progressive Growing of GANs



GAN DISSECTION: VISUALIZING AND UNDERSTANDING GENERATIVE ADVERSARIAL NETWORKS

**David Bau^{1,2}, Jun-Yan Zhu¹, Hendrik Strobelt^{2,3}, Bolei Zhou⁴,
Joshua B. Tenenbaum¹, William T. Freeman¹, Antonio Torralba^{1,2}**
¹Massachusetts Institute of Technology, ²MIT-IBM Watson AI Lab,
³IBM Research, ⁴The Chinese University of Hong Kong



ablate person units



ablate curtain units

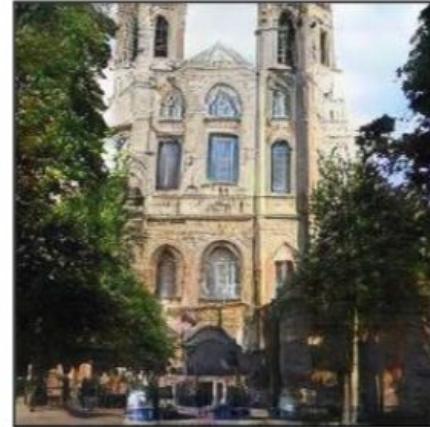
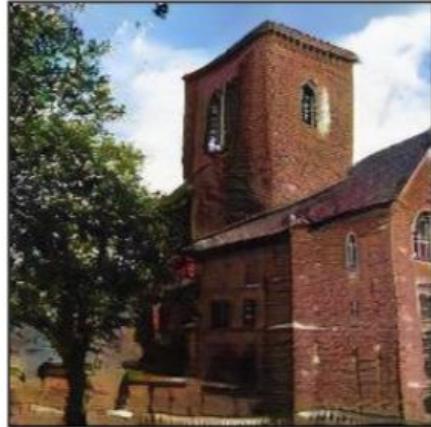
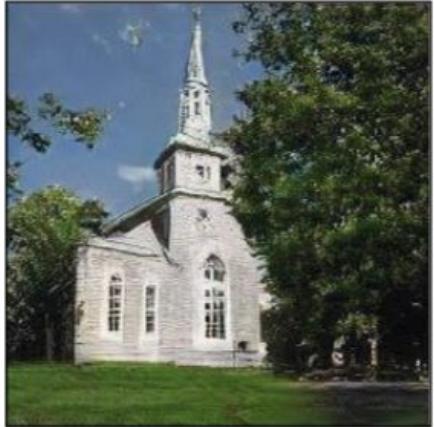


ablate window units



ablate table units





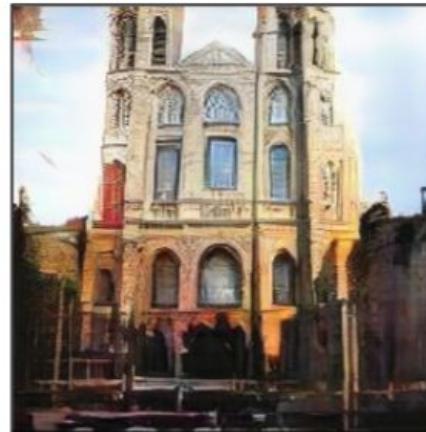
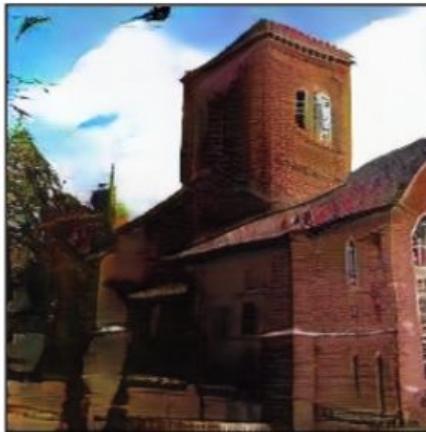
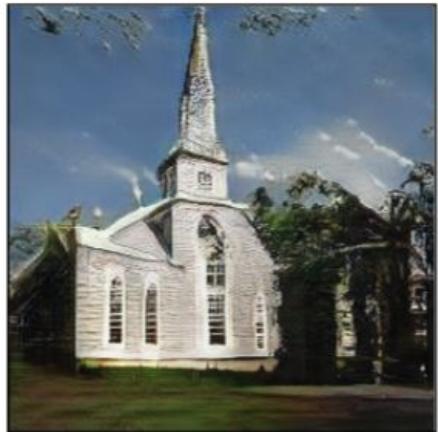
(a) Generate images of churches



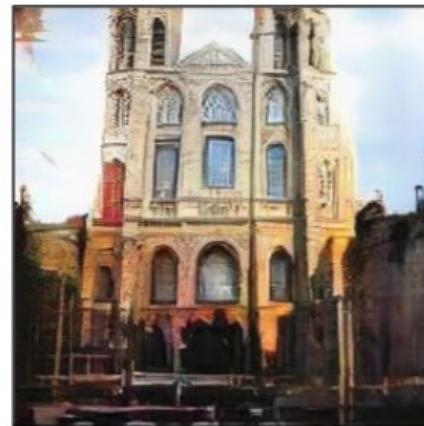
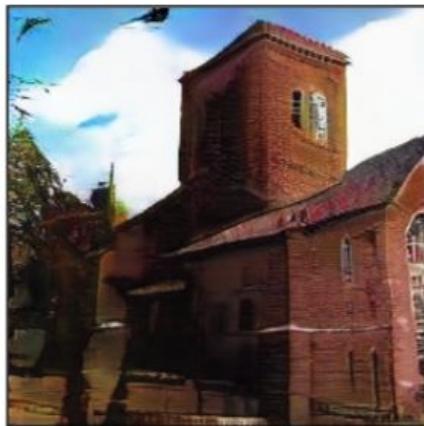
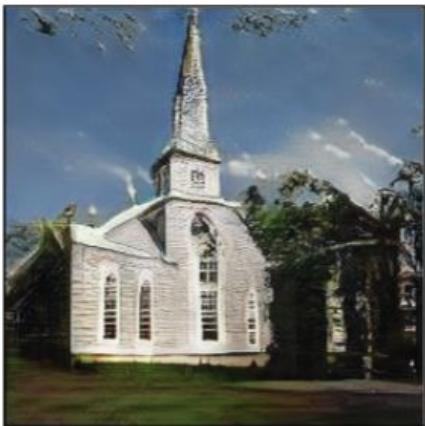
(b) Identify GAN units that match trees



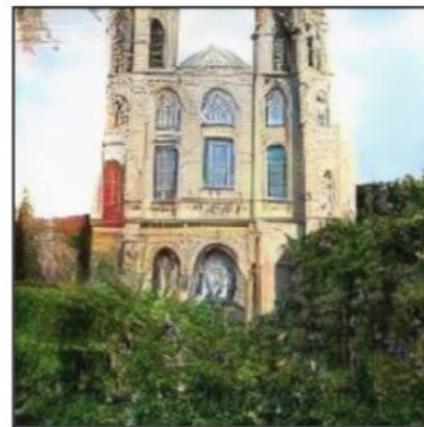
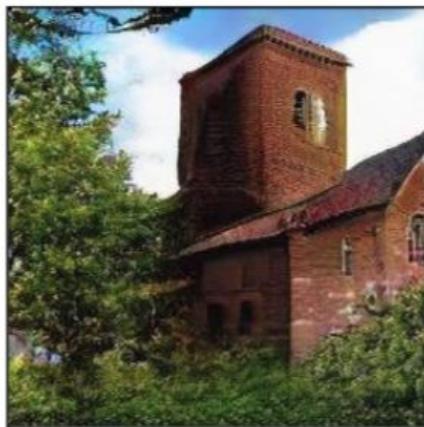
(b) Identify GAN units that match trees



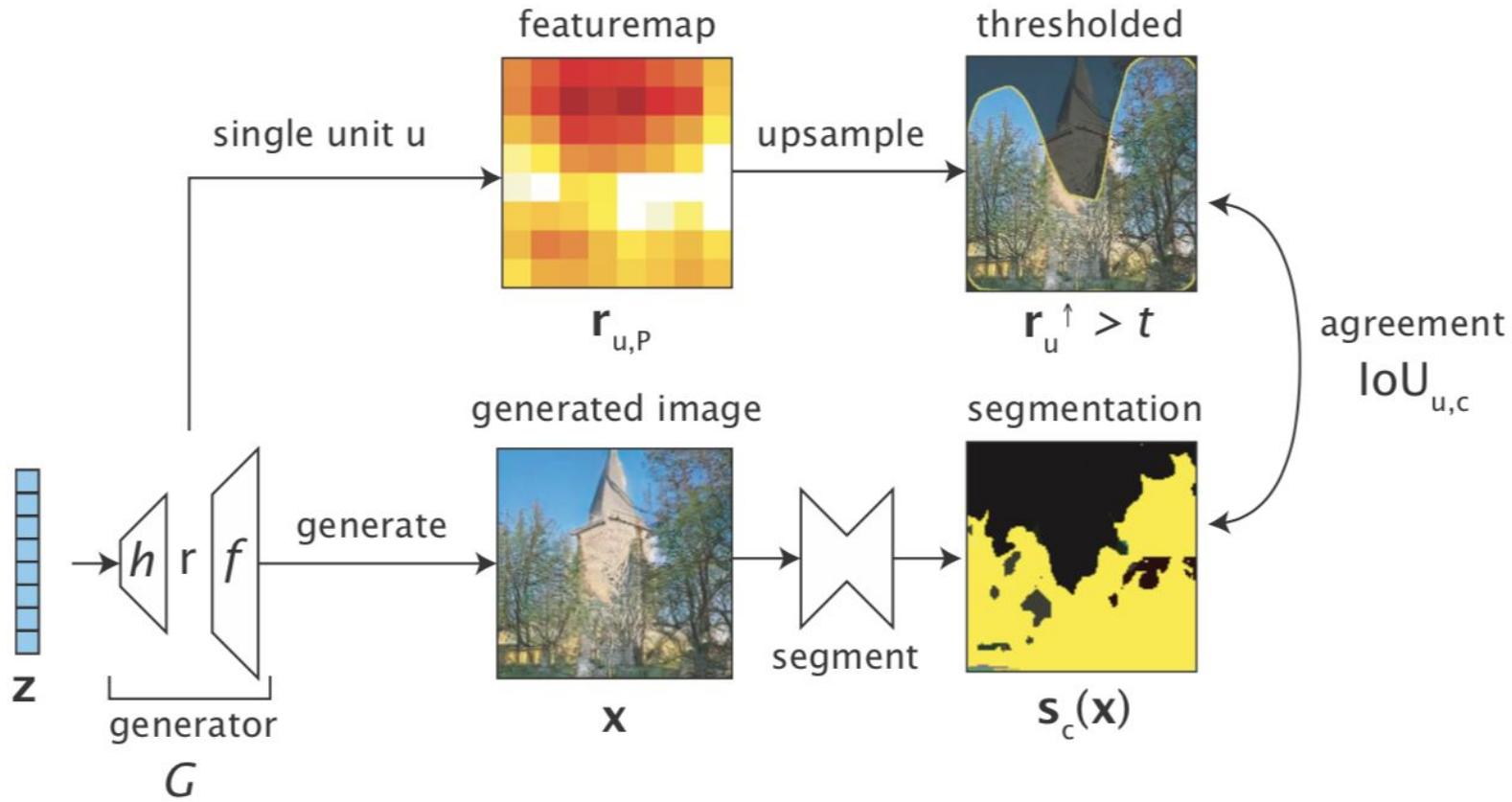
(c) Ablating units removes trees



(c) Ablating units removes trees



(d) Activating units adds trees

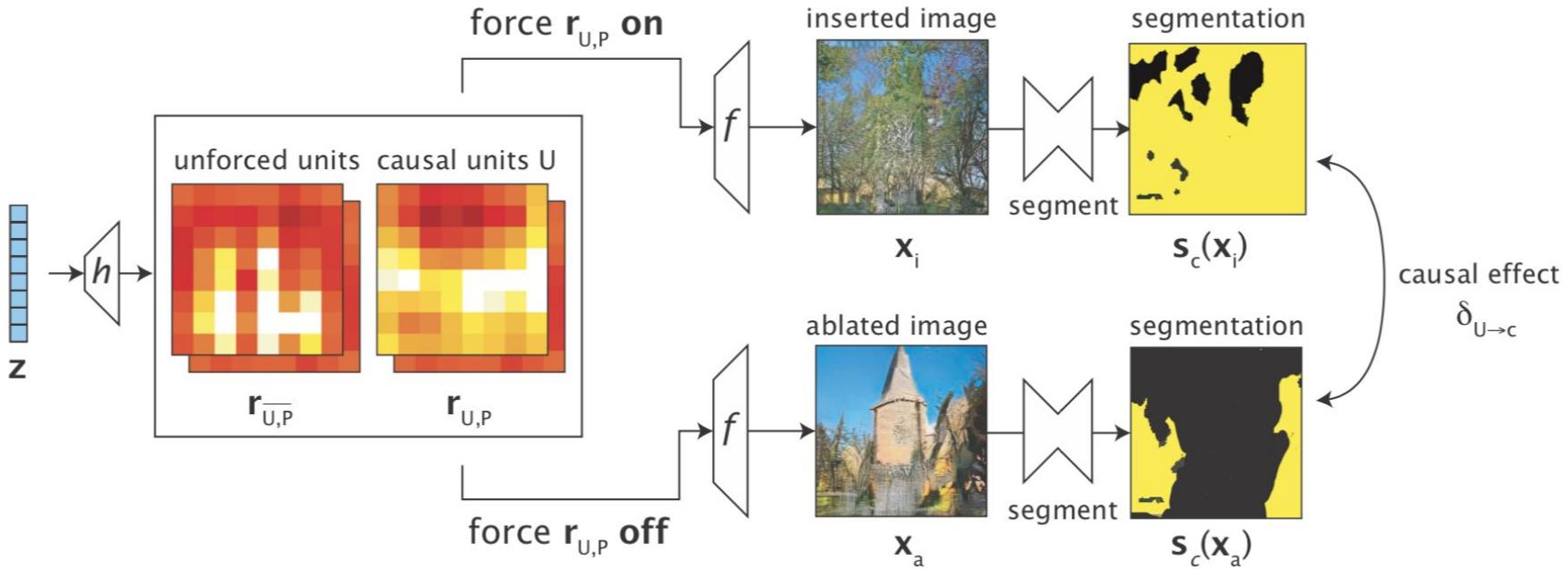




thresholding unit #65 layer 3 of a dining room generator matches ‘table’ segmentations with IoU=



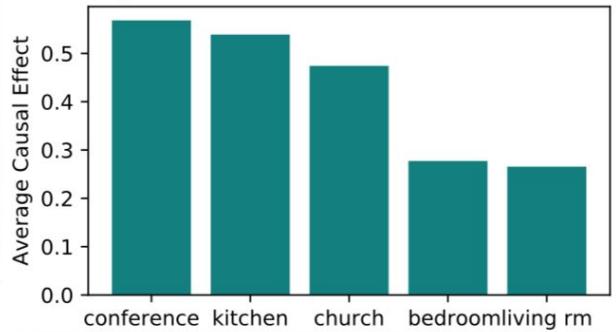
thresholding unit #37 layer 4 of a living room generator matches ‘sofa’ segmentations with IoU=



GAN Paint

<https://youtu.be/yVCqUYe4JTM?t=149>

Ablating Window Units from Several Generators



conference room



church



kitchen



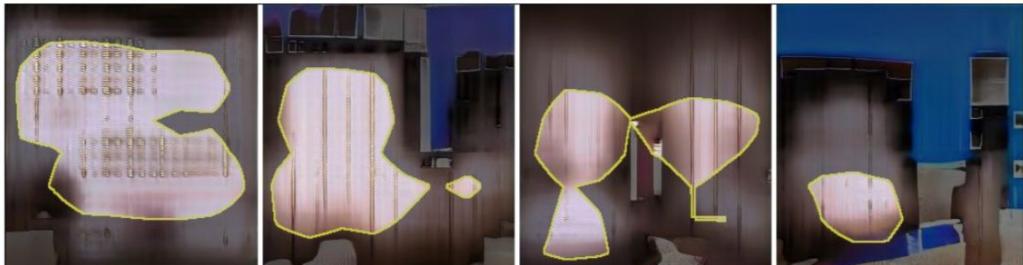
living room



bedroom



Unit #63



(a) Example artifact-causing units

Unit #231



(c) Ablating “artifact” units improves results



(b) Bedroom images with artifacts

Binary Networks

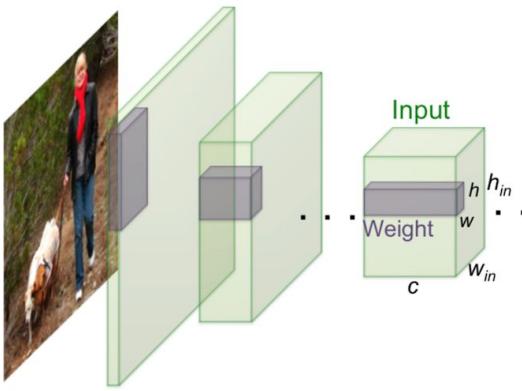
XNOR-Net: ImageNet Classification Using Binary Convolutional Neural Networks

Mohammad Rastegari[†], Vicente Ordonez[†], Joseph Redmon*, Ali Farhadi^{†*}

Allen Institute for AI[†], University of Washington*

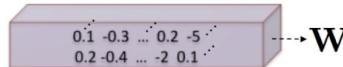
{mohammadr, vicenteor}@allenai.org

{pjreddie, ali}@cs.washington.edu

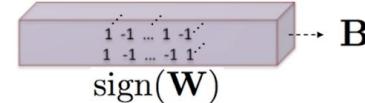


	Network Variations	Operations used in Convolution	Memory Saving (Inference)	Computation Saving (Inference)	Accuracy on ImageNet (AlexNet)
Standard Convolution	<p>Real-Value Inputs</p> <p>Real-Value Weights</p>	+ , - , ×	1x	1x	%56.7
Binary Weight	<p>Real-Value Inputs</p> <p>Binary Weights</p>	+ , -	~32x	~2x	%56.8
BinaryWeight Binary Input (XNOR-Net)	<p>Binary Inputs</p> <p>Binary Weights</p>	XNOR , bitcount	~32x	~58x	%44.2

(1) Binarizing Weight

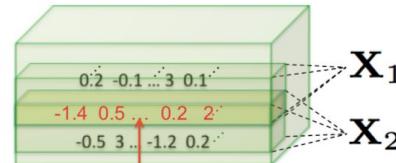


$$\frac{1}{n} \|\mathbf{W}\|_{\ell_1} = \alpha$$



(2) Binarizing Input

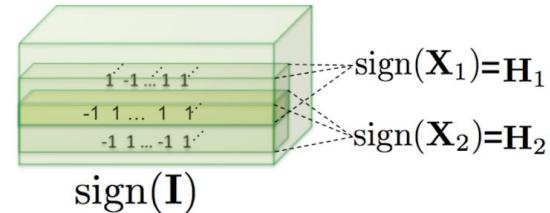
Inefficient



Redundant computations in overlapping areas

$$\frac{1}{n} \|\mathbf{X}_1\|_{\ell_1} = \beta_1$$

$$\frac{1}{n} \|\mathbf{X}_2\|_{\ell_1} = \beta_2$$



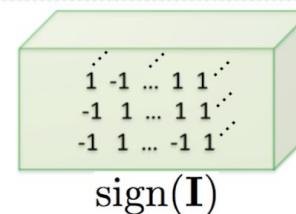
(3) Binarizing Input

Efficient

$$\sum_{c=1}^C |\mathbf{I}_{:, :, c}| = \mathbf{A}$$

$$\mathbf{A} *_{\mathbf{k}} \mathbf{K} = \beta_1$$

$$\beta_2$$

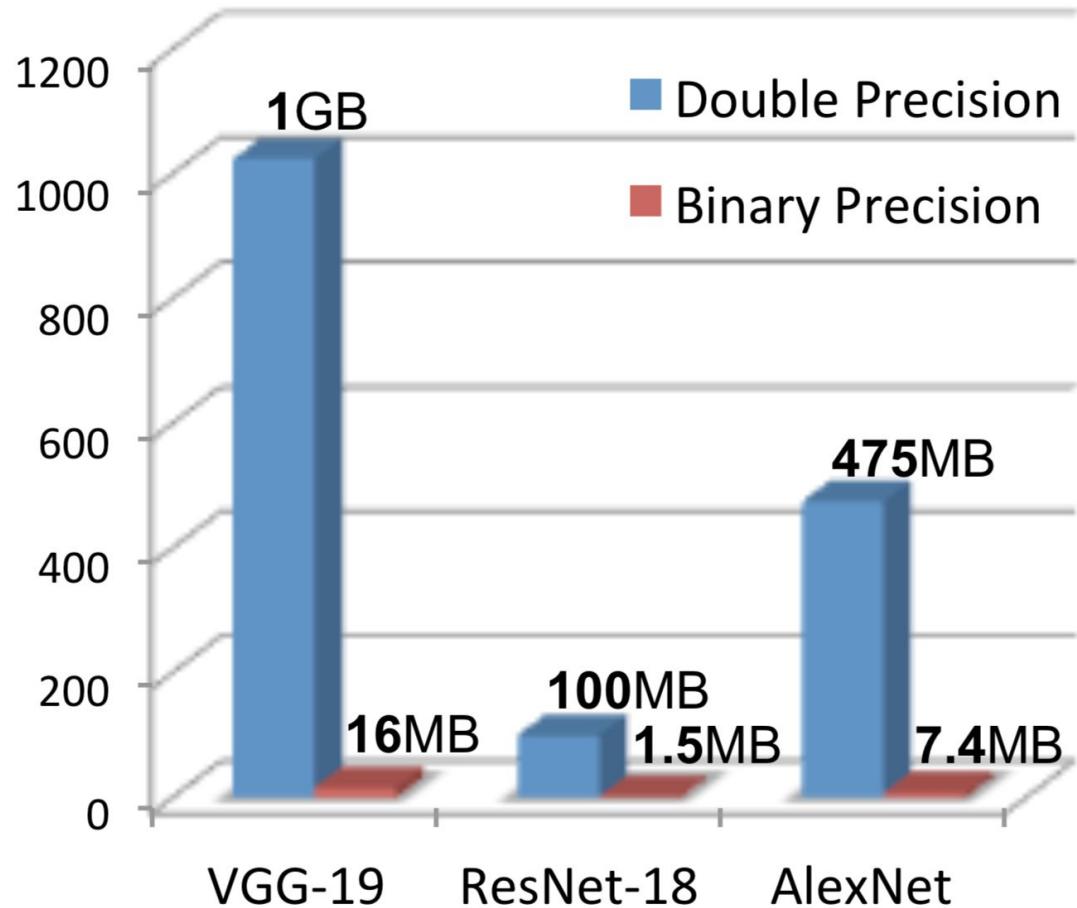


(4) Convolution with XNOR-Bitcount

$$\mathbf{I} * \mathbf{W} \approx$$

$$\left[\mathbf{I} *_{\mathbf{k}} \mathbf{K} \right] \odot \alpha$$

$\mathbf{I} *_{\mathbf{k}} \mathbf{K} \approx \mathbf{I} *_{\mathbf{k}} \text{sign}(\mathbf{W})$



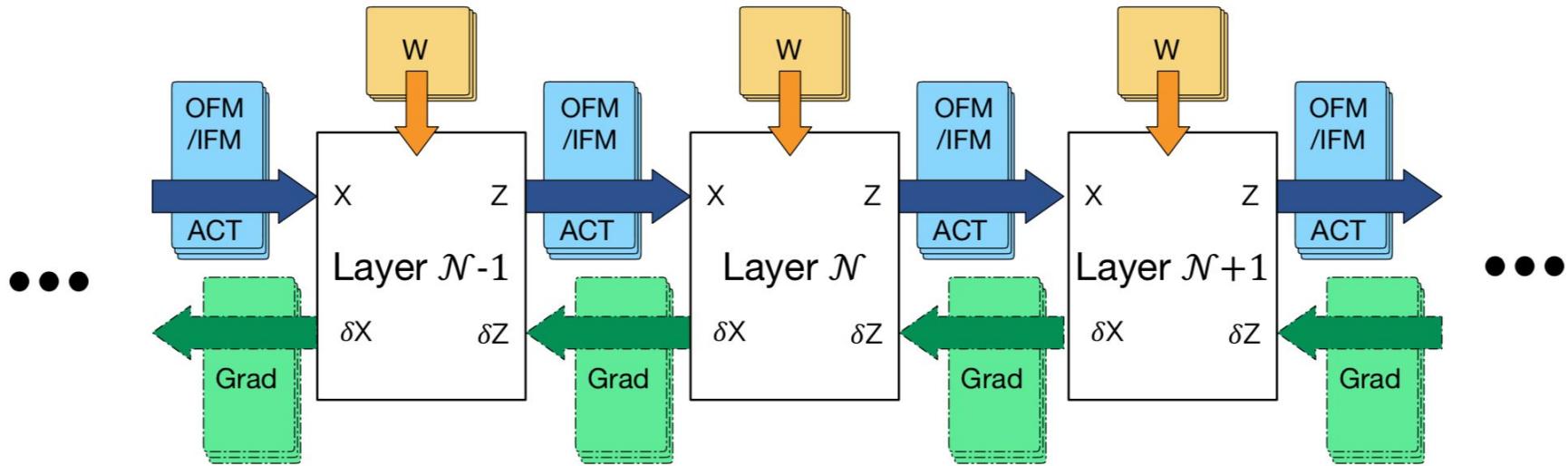
WRPN: WIDE REDUCED-PRECISION NETWORKS

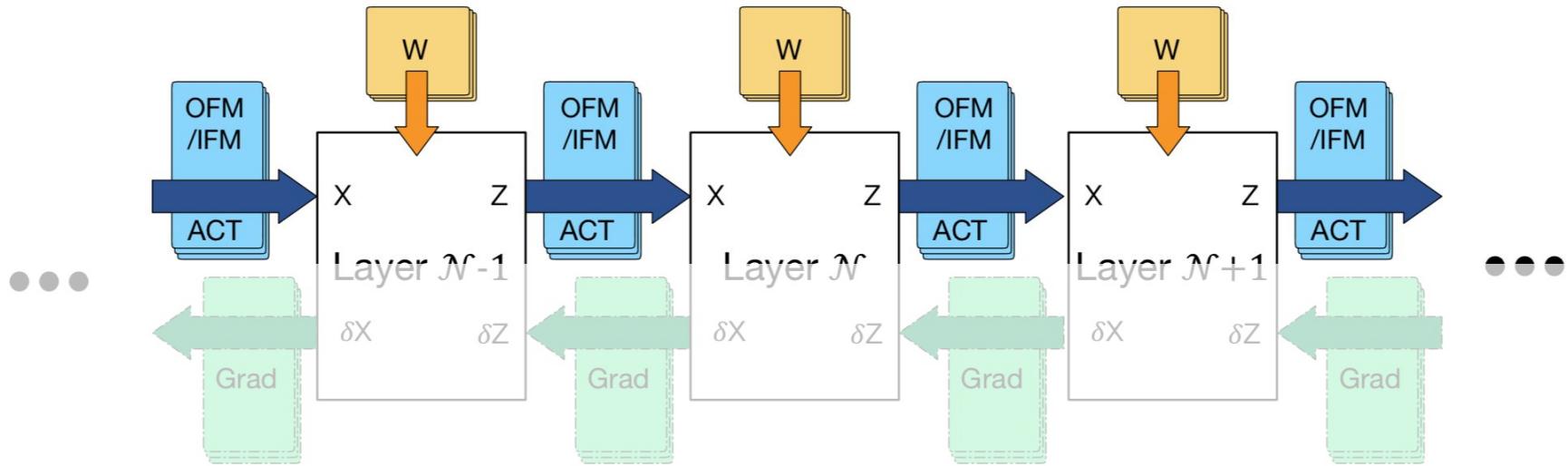
Asit Mishra, Eriko Nurvitadhi, Jeffrey J Cook & Debbie Marr

Accelerator Architecture Lab

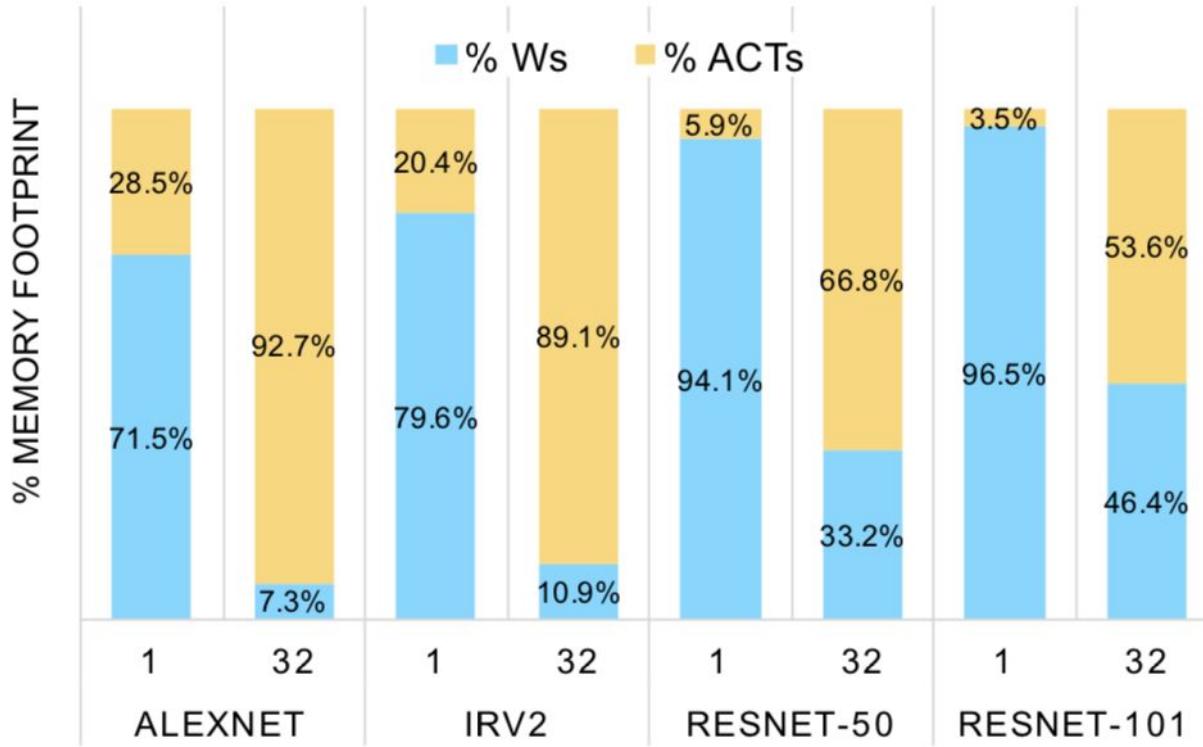
Intel Labs

{asit.k.mishra, eriko.nurvitadhi, jeffrey.j.cook, debbie.marr}@intel.com



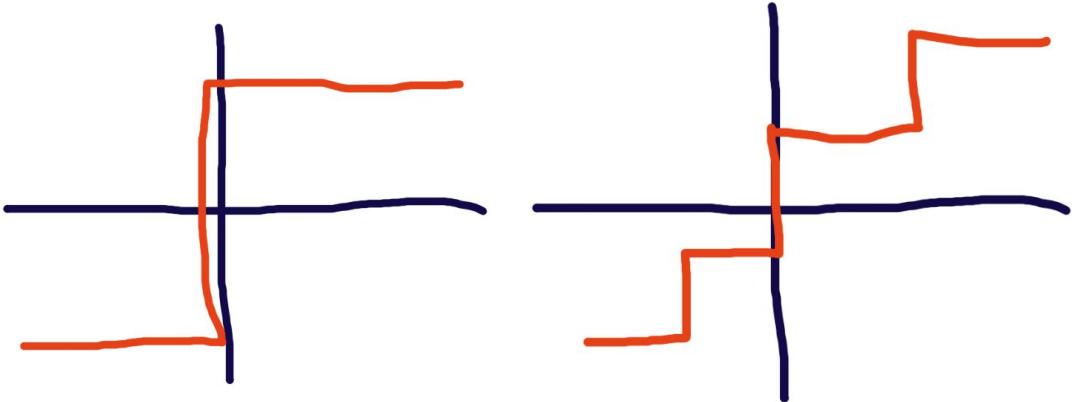


INFERENCE

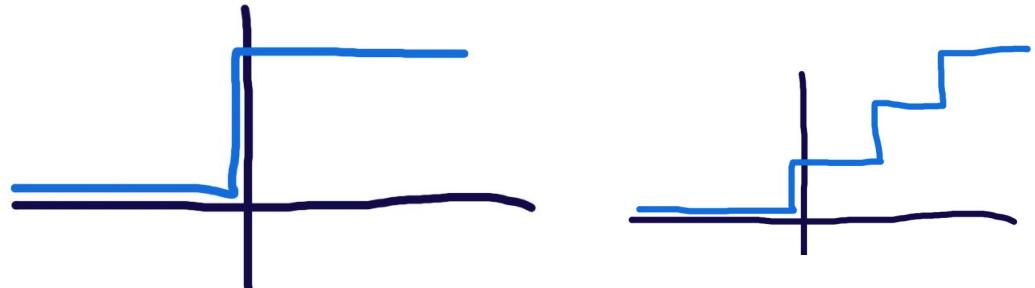


Reduced Precision

$$w_k = \frac{1}{2^{k-1} - 1} \text{round}((2^{k-1} - 1) * w_i)$$



$$a_k = \frac{1}{2^k - 1} \text{round}((2^k - 1) * a_i)$$



Reduced Precision



WRPN: WIDE REDUCED-PRECISION NETWORKS

Asit Mishra, Eriko Nurmukhamedov, Jeffrey J Cook & Debbie Marr

Accelerator Architecture Lab

Intel Labs

{asit.k.mishra, eriko.nurmukhamedov, jeffrey.j.cook, debbie.marr}@intel.com

$$a_k = \frac{1}{2^k - 1} \text{round}((2^k - 1) * a_i)$$



Table 1: AlexNet top-1 validation set accuracy % as precision of activations (A) and weight(W) changes. All results are with end-to-end training of the network from scratch. – is a data-point we did not experiment for.

	32b A	8b A	4b A	2b A	1b A
32b W	57.2	54.3	54.4	52.7	–
8b W	–	54.5	53.2	51.5	–
4b W	–	54.2	54.4	52.4	–
2b W	57.5	50.2	50.5	51.3	–
1b W	56.8	–	–	–	44.2

Table 1: AlexNet top-1 validation set accuracy % as precision of activations (A) and weight(W) changes. All results are with end-to-end training of the network from scratch. – is a data-point we did not experiment for.

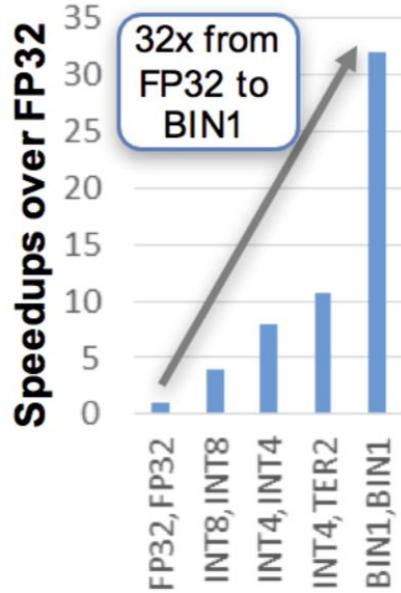
	32b A	8b A	4b A	2b A	1b A
32b W	57.2	54.3	54.4	52.7	–
8b W	–	54.5	53.2	51.5	–
4b W	–	54.2	54.4	52.4	–
2b W	57.5	50.2	50.5	51.3	–
1b W	56.8	–	–	–	44.2

Table 2: AlexNet 2x-wide top-1 validation set accuracy % as precision of activations (A) and weights (W) changes.

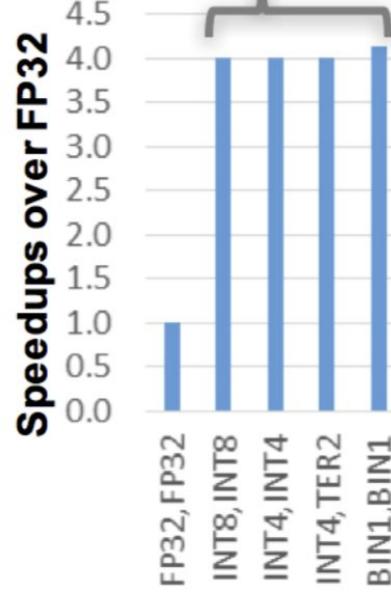
	32b A	8b A	4b A	2b A	1b A
32b W	60.5	58.9	58.6	57.5	52.0
8b W	–	59.0	58.8	57.1	50.8
4b W	–	58.8	58.6	57.3	–
2b W	–	57.6	57.2	55.8	–
1b W	–	–	–	–	48.3

Table 4: ResNet-34 top-1 validation accuracy % and compute cost as precision of activations (A) and weights (W) varies.

Width	Precision	Top-1 Acc. %	Compute cost
1x wide	32b A, 32b W	73.59	1x
	1b A, 1b W	60.54	0.03x
2x wide	4b A, 8b W	74.48	0.74x
	4b A, 4b W	74.52	0.50x
	4b A, 2b W	73.58	0.39x
	2b A, 4b W	73.50	0.39x
	2b A, 2b W	73.32	0.27x
	1b A, 1b W	69.85	0.15x
3x wide	1b A, 1b W	72.38	0.30x

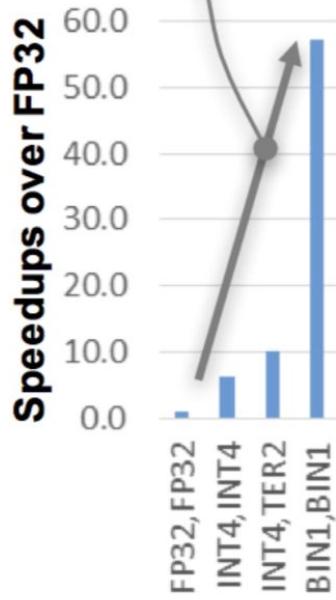


(b) First-order speedup estimates based on bit-width



(c) GPU speedups for low-precision operations

In practice, only up to ~4x speedups in GPU, since no support for sub 8-bit precisions



(d) FPGA speedups for low-precision operations

FPGA speedups are tracking 1st order estimates, since its fabric is a good fit for custom low-precision operations

Websites / Courses / Conferences

ICLR 2019 – New Orleans

<https://iclr.cc/>

Mon May 6th through Thu the 9th

Registration opens **Jan 29th, 1am (!) CET** (4pm PST)



The image shows the top navigation bar of the OpenReview.net website. It features a dark red background. On the left, the text "OpenReview.net" is written in white. To its right is a search bar with the placeholder "Search OpenReview..." and a magnifying glass icon. The rest of the bar is solid red.

ICLR 2019

International Conference on Learning Representations



New Orleans, Louisiana, United States



May 6 - May 9, 2019



<https://iclr.cc/Conferences/2019>

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Please contact the ICLR 2019 Program Chairs at iclr2019programchairs@googlegroups.com with any questions or concerns about conference i

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BA-Net: Dense Bundle Adjustment Networks



Chengzhou Tang, Ping Tan

ICLR 2019 – New Orleans

<https://iclr.cc/>

Mon May 6th through Thu the 9th

Registion still open! :-)

ICLR 2019

International Conference on Learning Representations

 New Orleans, Louisiana, United States  May 6 - May 9, 2019  <https://iclr.cc/Conferences/2019>

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Submitted Papers

BA-Net: Dense Bundle Adjustment Networks



Chengzhou Tang, Ping Tan

Enroll in “AI for Everyone” today!

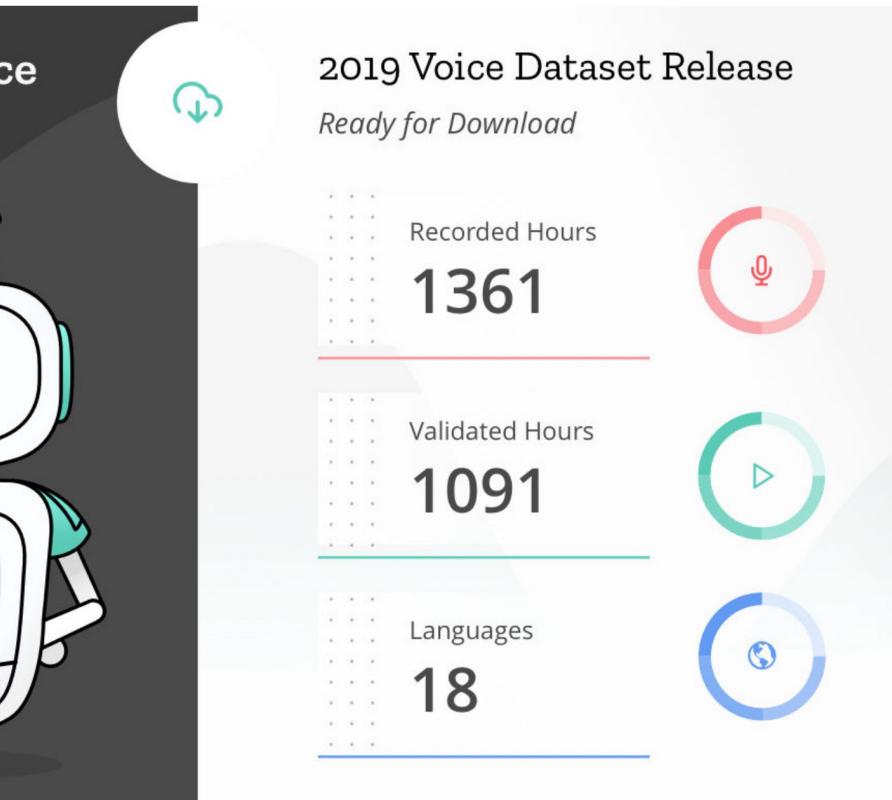
Dear friends,

“AI for Everyone” is now available for you to take on Coursera. If you want your organization to become better at using AI, this is the course to tell everyone—especially your non-technical colleagues—to take.

For non-engineers: This course will teach you how to select promising AI projects, how to work with AI engineers, and how to set AI strategy. You’ll learn what AI can and cannot do today and how to leverage its awesome capabilities for your work.

For engineers: You’ll find this course non-technical, but if you’re interested in learning the business aspects of AI, this course will be a great resource. And if you want your company to embrace AI, quite possibly the best thing you could do is get your CEO to take this!

Mozilla speech dataset



Sharing our Common Voices – Mozilla releases the largest to-date public domain transcribed voice dataset

George Roter | February 28, 2019

Mozilla crowdsources the largest dataset of human voices available for use, including 18 different languages, adding up to almost 1,400 hours of recorded voice data from more than 42,000 contributors.

THE **LINUX** FOUNDATION PROJECTS

DLF DEEP LEARNING

Introducing the Interactive Deep Learning Landscape

By dbrown | December 10, 2018 | Blog

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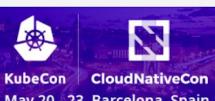
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LF Deep Learning Foundation Interactive Landscape

The LF Deep Learning Foundation landscape ([png](#), [pdf](#)) is dynamically generated below. It is modeled after the [CNCF landscape](#) and based on the same open source code. Please [open](#) a pull request to correct any issues. Greyed logos are not open source. Last Updated: 2019-02-28 01:43:53Z

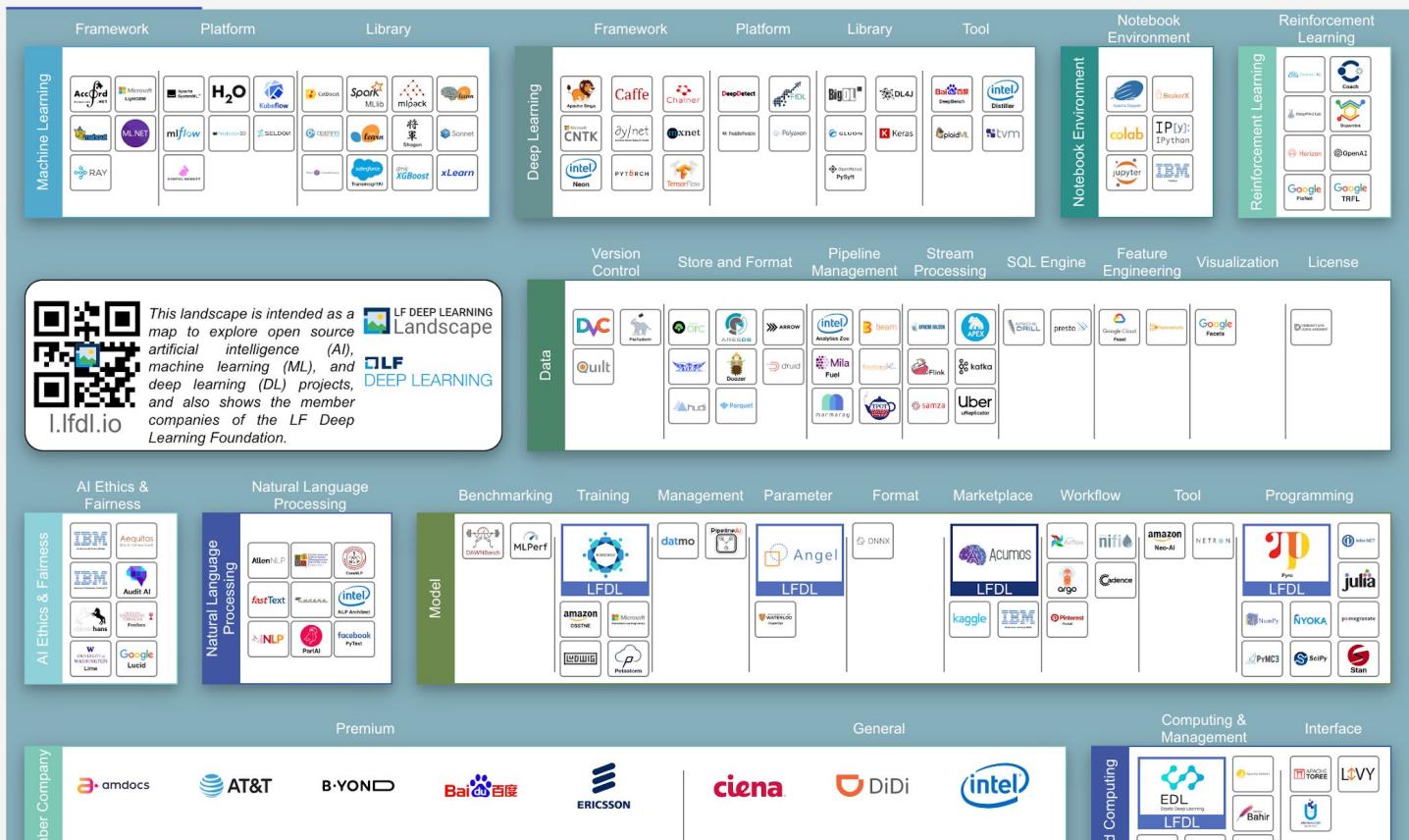
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Vienna



Deep Learning Meetup

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27 March 2019 @ A1 Telekom Austria
Neural Language Processing - NLP

www.meetup.com/Vienna-Deep-Learning-Meetup