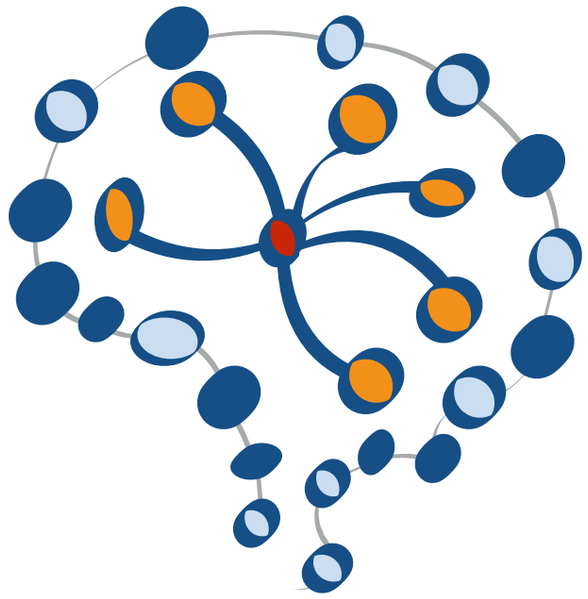
STAT 453: Introduction to Deep Learning and Generative Models

Sebastian Raschka

http://stat.wisc.edu/~sraschka/teaching



Deep Learning & AI News #3

Interesting Things Related to Deep Learning

Feb 13th, 2021

arXiv.org > cs > arXiv:2102.06171

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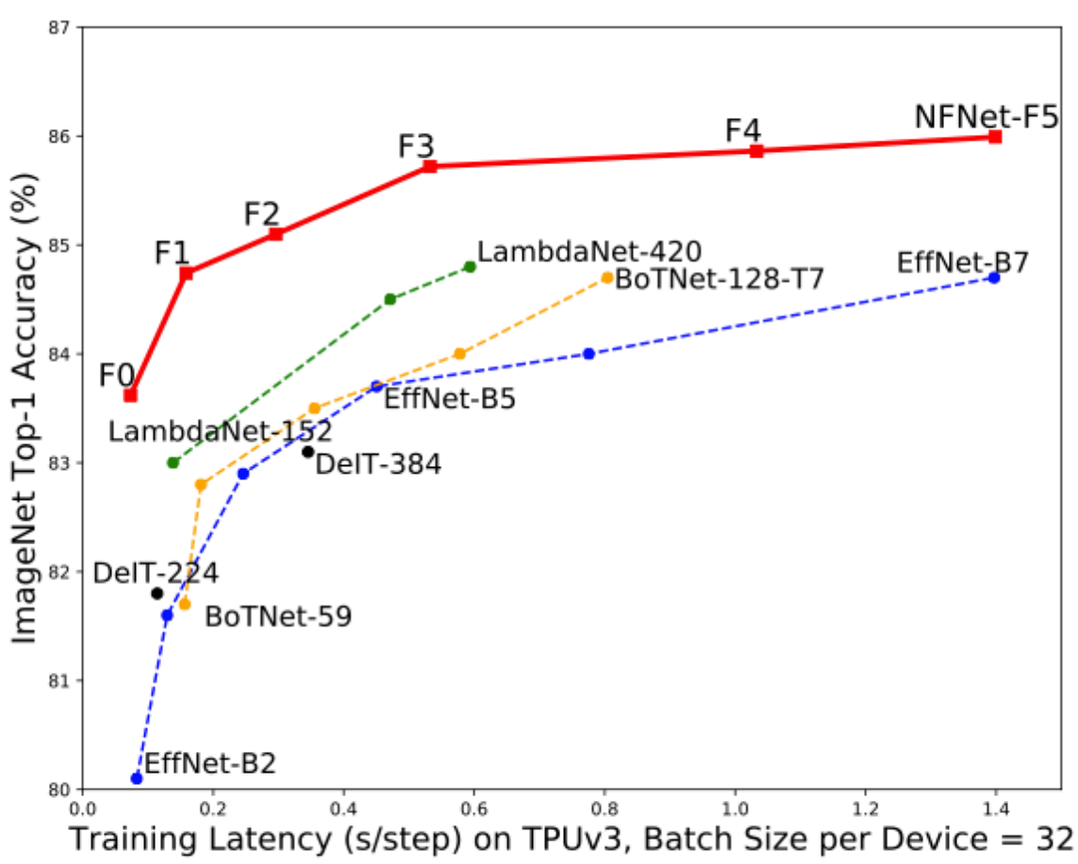
Computer Science > Computer Vision and Pattern Recognition

[Submitted on 11 Feb 2021]

High-Performance Large-Scale Image Recognition Without Normalization

Andrew Brock, Soham De, Samuel L. Smith, Karen Simonyan

- New image classification SOTA without BatchNorm
- Developed an adaptive gradient clipping technique to overcome instabilities that arise from not using BatchNorm
- Result: Normalizer-free ResNets that are faster to train and result in SOTA performance



Discussion **[D] Deep Learning Theory** (self.MachineLearning)
submitted 3 days ago by mocny-chlapik

Hey,

I wonder, what are some recent advancements in the theory of deep learning. I am curious about some of the more general and holistic theories. E.g. I know about the lottery ticket hypothesis (overparametrized networks have a lot of combinations, there is a high probability that at least one will be near-optimal) or the double descent hypothesis (overparametrized networks generalize better). What are some other interesting hypotheses and theories related to deep learning that try to explain how does it all work in the end? I am especially interested in the most recent stuff, e.g. was there anything that gained traction in the community at NeurIPS?

https://old.reddit.com/r/MachineLearning/comments/lgsgz8/d_deep_learning_theory/

https://openai.com/blog/deep-double-descent/

arXiv.org > cs > arXiv:2102.03054

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Computer Science > Machine Learning

[Submitted on 5 Feb 2021]

Removing biased data to improve fairness and accuracy

Sahil Verma, Michael Ernst, Rene Just

- Low discrimination (almost 0%) when trained on debiased data
- Higher accuracy compared to models trained on full data
- According to the authors, other methods only achieve fairness at the expense of accuracy

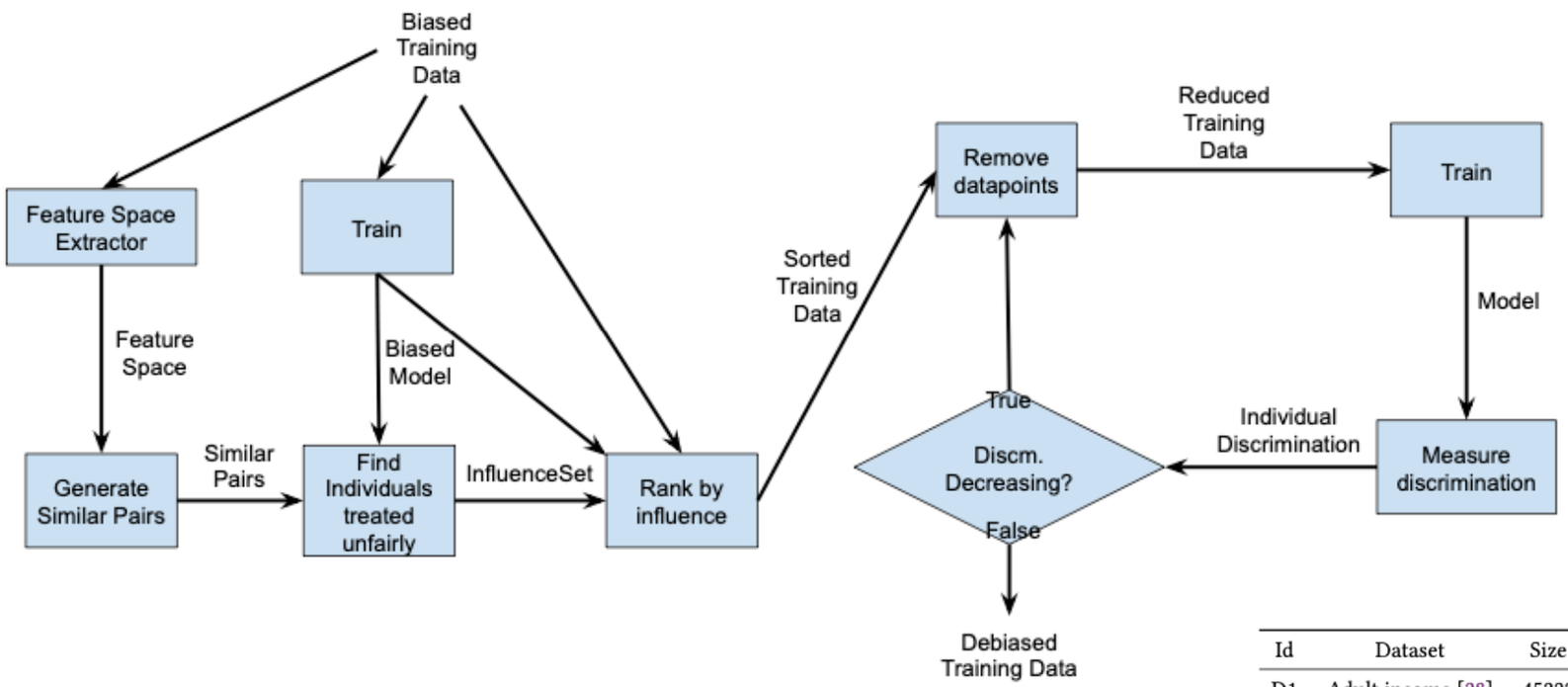


Table 2: Datasets used in the evaluation

Id	Dataset	Size	# Numerical Attrs.	# Categorical Attrs.	Sensitive Attr. (S)	Training label (binary)
D1	Adult income [28]	45222	1	11	Sex	Income ≥ $50K
D2	Adult income [28]	43131	1	11	Race	Income ≥ $50K
D3	German credit [30]	1000	3	17	Sex	Credit worthiness
D4	Student [31]	649	4	28	Sex	Exam score ≥ 11
D5	Recidivism [50]	6150	7	3	Race	Ground-truth recidivism
D6	Recidivism [50]	6150	7	3	Race	Prediction of recidivism
D7	Credit default [29]	30000	14	9	Sex	Credit worthiness
D8	Salary [94]	52	2	3	Sex	Salary ≥ $23719

Google AI Blog

The latest news from Google AI

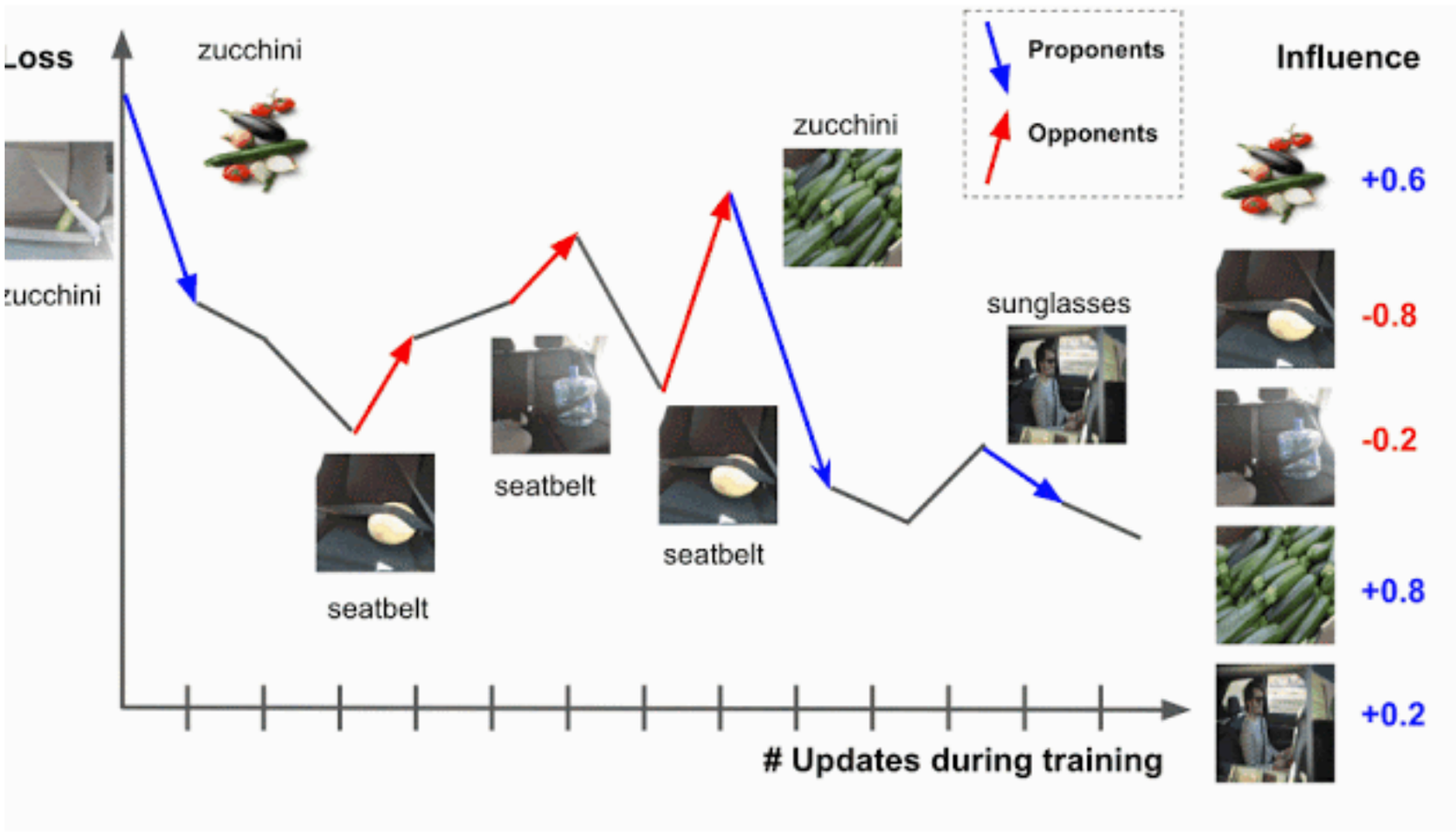
TracIn — A Simple Method to Estimate Training Data Influence

Friday, February 5, 2021

Posted by Frederick Liu and Garima Pruthi, Software Engineers, Google Research

https://ai.googleblog.com/2021/02/tracin-simple-method-to-estimate.html

- "trace:" during training, record changes in prediction caused by an individual training example
- useful for detecting outliers
- explains predictions from training examples rather than features



This human genome does not exist: Researchers taught an AI to generate fake DNA

https://thenextweb.com/neural/2021/02/08/this-human-genome-does-not-exist-researchers-taught-an-ai-to-generate-fake-dna/

https://thispersondoesnotexist.com

"In our work, we apply a similar concept to genetic data to automatically learn its structure and, for the first time, produce high quality realistic genomes."

https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1009303

https://thiscatdoesnotexist.com

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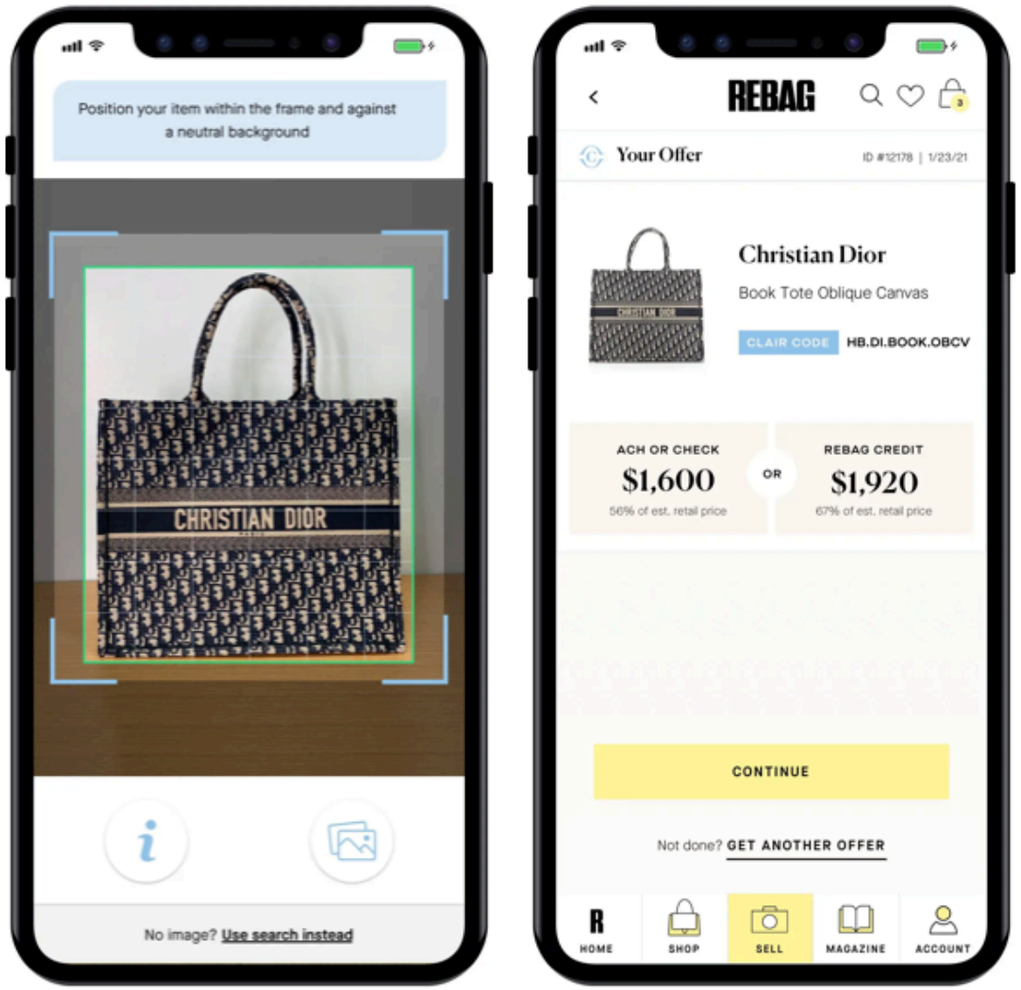
How Artificial Intelligence Will Change the Way You Shop for Your Next Handbag

https://www.vogue.com/article/rebag-launches-clair-ai-image-recognition-tool

BY NICOLE PHELPS

February 3, 2021



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Receive an instant offer. Photo: Courtesy of Rebag
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