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Walt Disney ANIMATION STUDIOS

JUNE 2020 WEBINAR

Hands-on Workshop: Machine Learning and Neural Networks

SIGGRAPHNOW

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Machine Learning

Rajesh Sharma

Today

- Recap
- Finish up with MLE
- Build an autoencoder
- Build an efficient pipeline to
    - Read images
    - Batch input

Questions

Can too many layers be harmful, besides increasing optimization time and memory?	Martin Eisemann
In the sin curve case would it be good to overtrain, since our ground truth is very well defined	Anonymous Attendee
Is there a way to include the periodicity of the sine in the model? I guess it's now limited to the input data range.	Anonymous Attendee
What does axis=1 and axis = 0 do in this case	Anonymous Attendee
Shouldn’t we apply the transformation used for normalizing the train data on the test data? I.e. use the train min and max to normalize the test data.	Diaaeldin Taha
Would it help to remove all entries with `species==0` (which are easy to classify without NN) from training set? E.g. in terms of classification? In terms of performance?	Ramses Ladlani
How can we tell if confusion matrix that is generated is the actual confusion matrix that we want?	Anonymous Attendee
What is "accuracy"?	Greg Klar
I tried training with 20 epochs; that made the confusion matrix perfect; but in the loss plot, the validation loss was higher than the train loss after 12 epochs. Question: isn't the latter usually a bad sign? (exactly same notebook, only epochs=20, no training before)	Gabriel Zachmann
How do you detect overtraining? Just when the error doesn't go down anymore when you train longer?	Marijn Eken
Where could I find instructions on how to set up the colab environment, and view the shared folders?	Jerry Dimsdale

Image Denoising

Denoising with Kernel Prediction and Asymmetric Loss Functions SIGGRAPH 2018, Vogels et al

Noisy image.....<similar image>.....Clean image

Denoising with Kernel Prediction and Asymmetric Loss Functions SIGGRAPH 2018, Vogels et al

Noisy image.....<similar image>.....Clean image

- If we have a set of noisy images and, a set of corresponding clean images,

- We can train our network to recover
  - Clean images from noisy images

- How
  - By setting Clean image as the ground truth,
  - the Noisy image as input and,
  - the loss function as the difference btwn the two

Don’t have a noisy version?

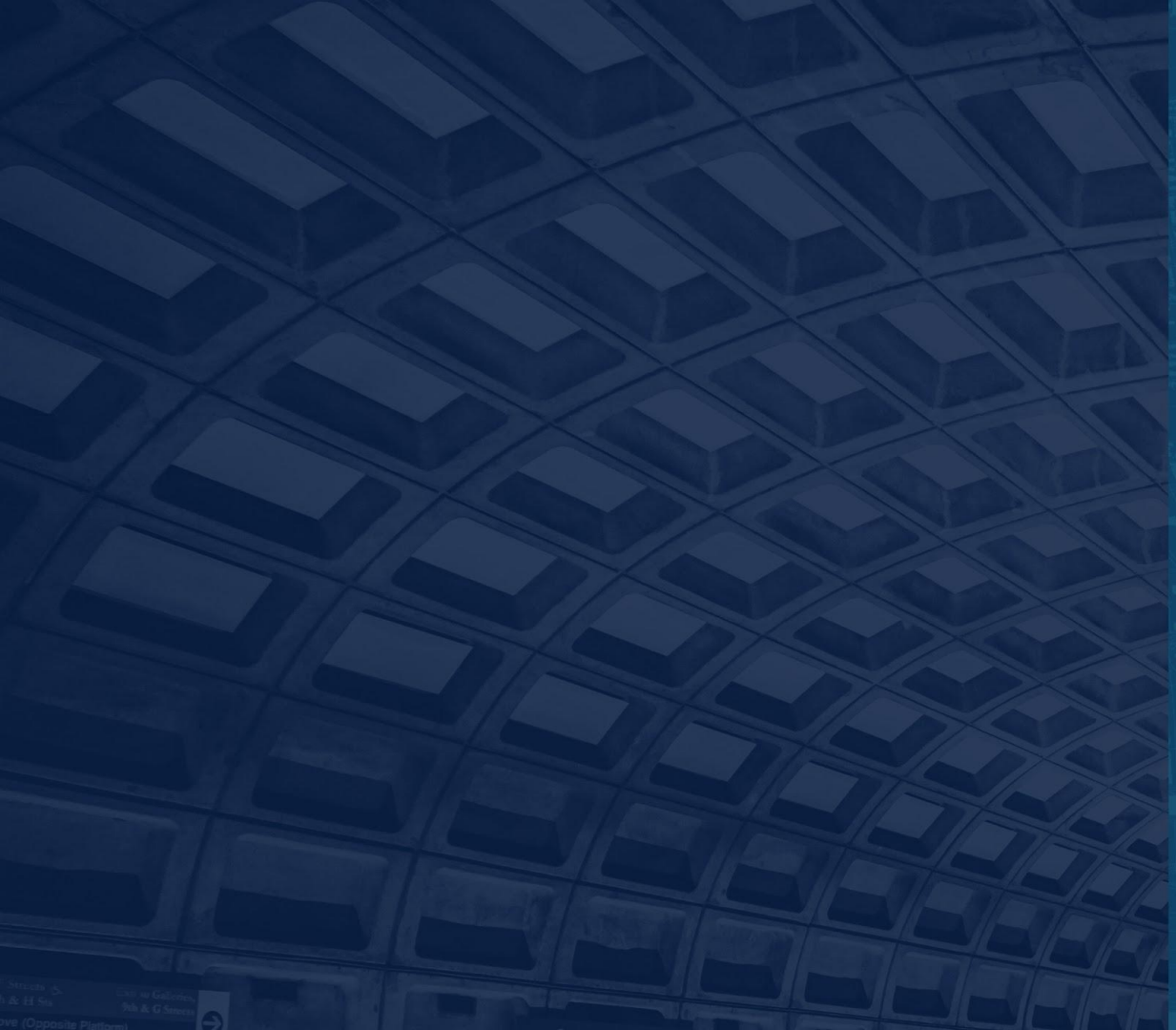
- Take a clean image
- Add synthetic noise to it (Data Augmentation)

But first, we need some more Engineering!

- Take a look at `dataPipeline.ipynb`
  - --tensorflow data sets and pipeline
  - --addNoise
  - --extractPatches

Next Class

- Convolutional Neural Network
- Denoising and Other Applications
- Homework:
  - Use the mnist dataset for classification
  - Extra credit: also show “next likely”
- @xarmalarma, #siggraphNOW



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QUESTIONS?

Submit now!

THANK YOU

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