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Walt Disney ANIMATION STUDIOS

JUNE 2020 WEBINAR

Hands-on Workshop: Machine Learning and Neural Networks

SIGGRAPHNOW

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8

Machine Learning

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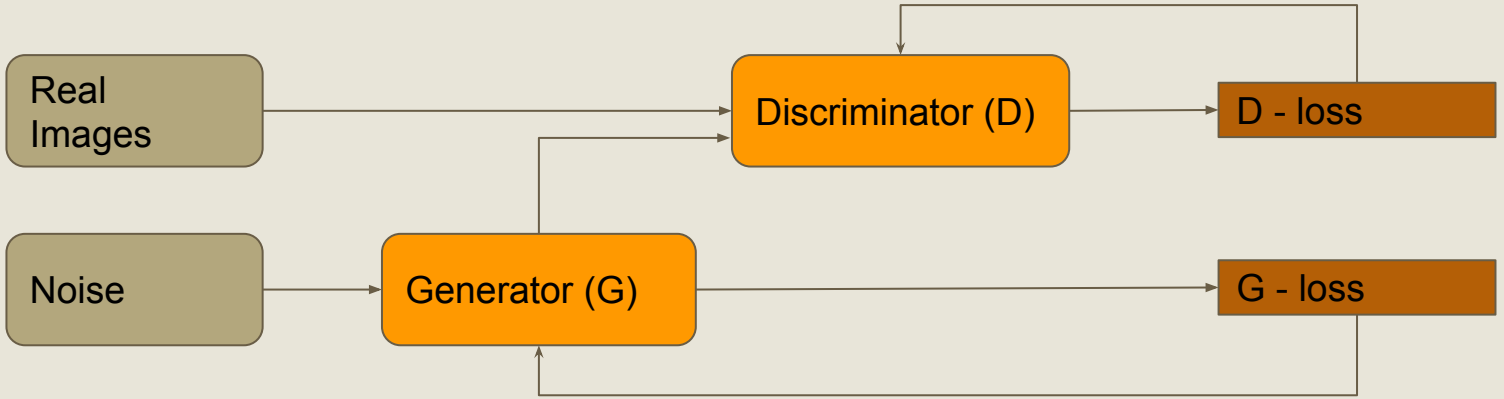
Today

- Recap
  - Generative Adversarial Network
- Recurrent Neural Networks

Questions?

GAN - Generative Adversarial Networks



GAN training proceeds in alternating periods:

1. The discriminator trains for one or more epochs.
2. The generator trains for one or more epochs.
3. Repeat steps 1 and 2 to continue to train the generator and discriminator networks.
4. Both the generator and the discriminator are neural networks.
5. The generator output is connected directly to the discriminator input.
6. Through backpropagation, the discriminator's classification is used by the generator to update its weights.

Hands on...

Find and open:

`mnistGAN.ipynb`

Advanced Examples

GANimals

GauGAN

What are RNNs?

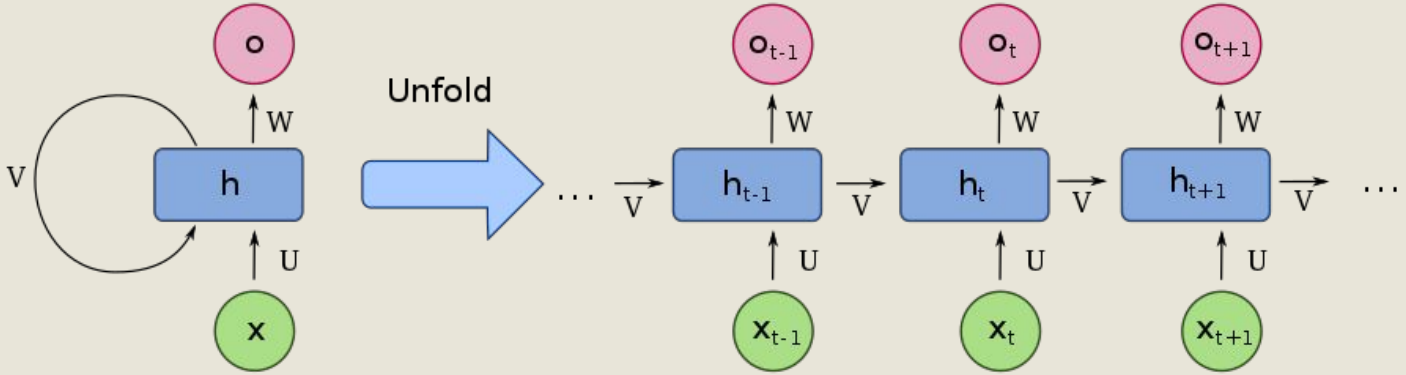
Information from previous timestep is passed forward

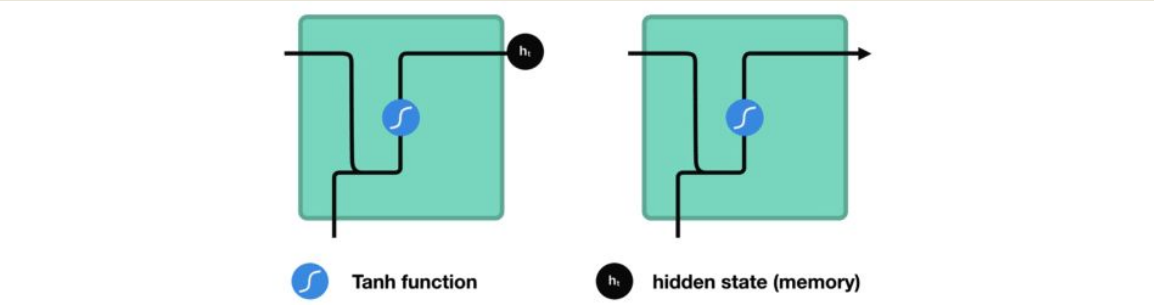
Useful for time-dependent data:

- Sequence prediction problems
- Language Translation: Speech, text, music

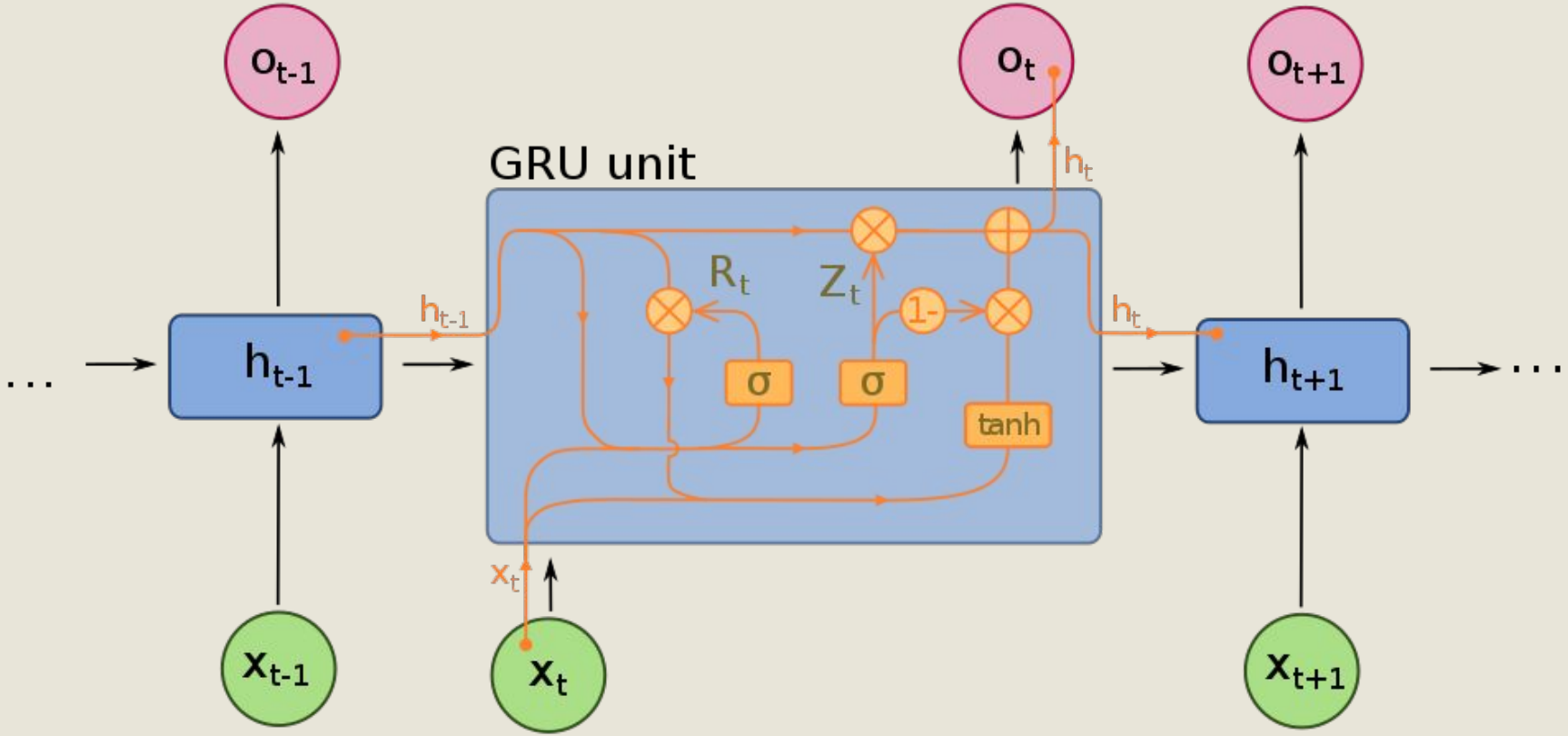
What are RNNs?

Information from previous timestep is passed forward





GRU - RNN with memory/state



Hands on...Text Generation

Given string of characters, what is the most probable next character?

Example:

Input: Machin

Output: achine

- Pick a sequence length
- Divide text into sequences
- Train on (sequence, sequence+1) pairs over the entire text
- Important: Convert all text to numbers first!

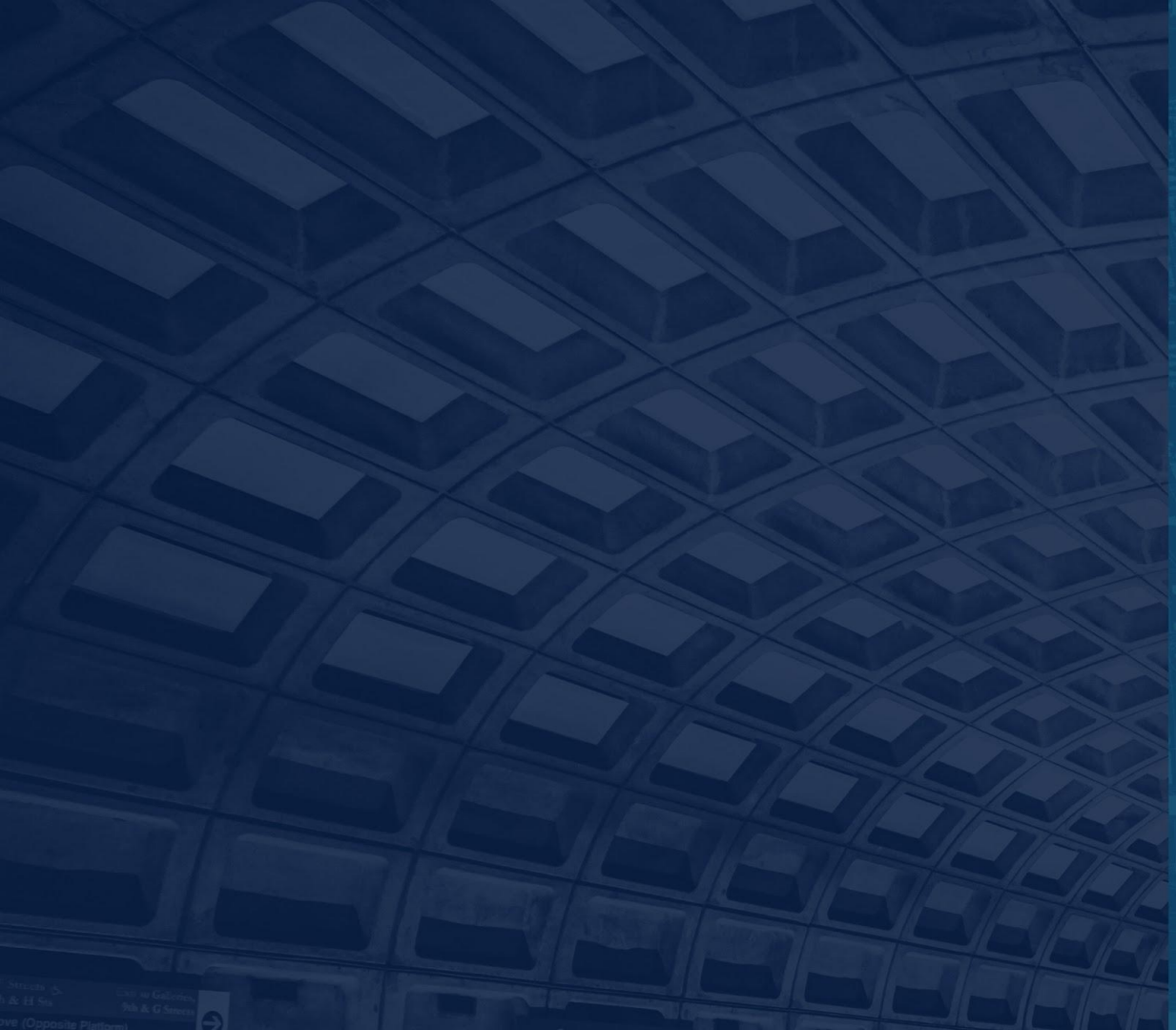
Hands on...

Find and open:

textRNN.ipynb

Next Class

- Reinforcement Learning
- Overall Summary
- Homework:
  a. GAN on color images, appleGAN.ipynb
  b. Use text predictions from a celeb tweet
- @xarmalarma, #siggraphNOW



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QUESTIONS?

Submit now!

THANK YOU

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