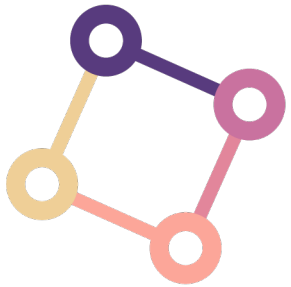
DEEP LEARNING

LECTURE 0: ROADMAP

goorm

KAIST AI
Graduate School of AI



DAVIAN
Data and Visual Analytics Lab

SYSTEM PROMPT (HUMAN-WRITTEN)

In a shocking finding, scientist discovered a herd of unicorns living in a remote, previously unexplored valley, in the Andes Mountains. Even more surprising to the researchers was the fact that the unicorns spoke perfect English.

MODEL COMPLETION (MACHINE-WRITTEN, 10 TRIES)

The scientist named the population, after their distinctive horn, Ovid's Unicorn. These four-horned, silver-white unicorns were previously unknown to science.

Now, after almost two centuries, the mystery of what sparked this odd phenomenon is finally solved.

Dr. Jorge Pérez, an evolutionary biologist from the University of La Paz, and several companions, were exploring the Andes Mountains when they found a small valley, with no other animals or humans. Pérez noticed that the valley had what appeared to be a natural fountain, surrounded by two peaks of rock and silver snow.

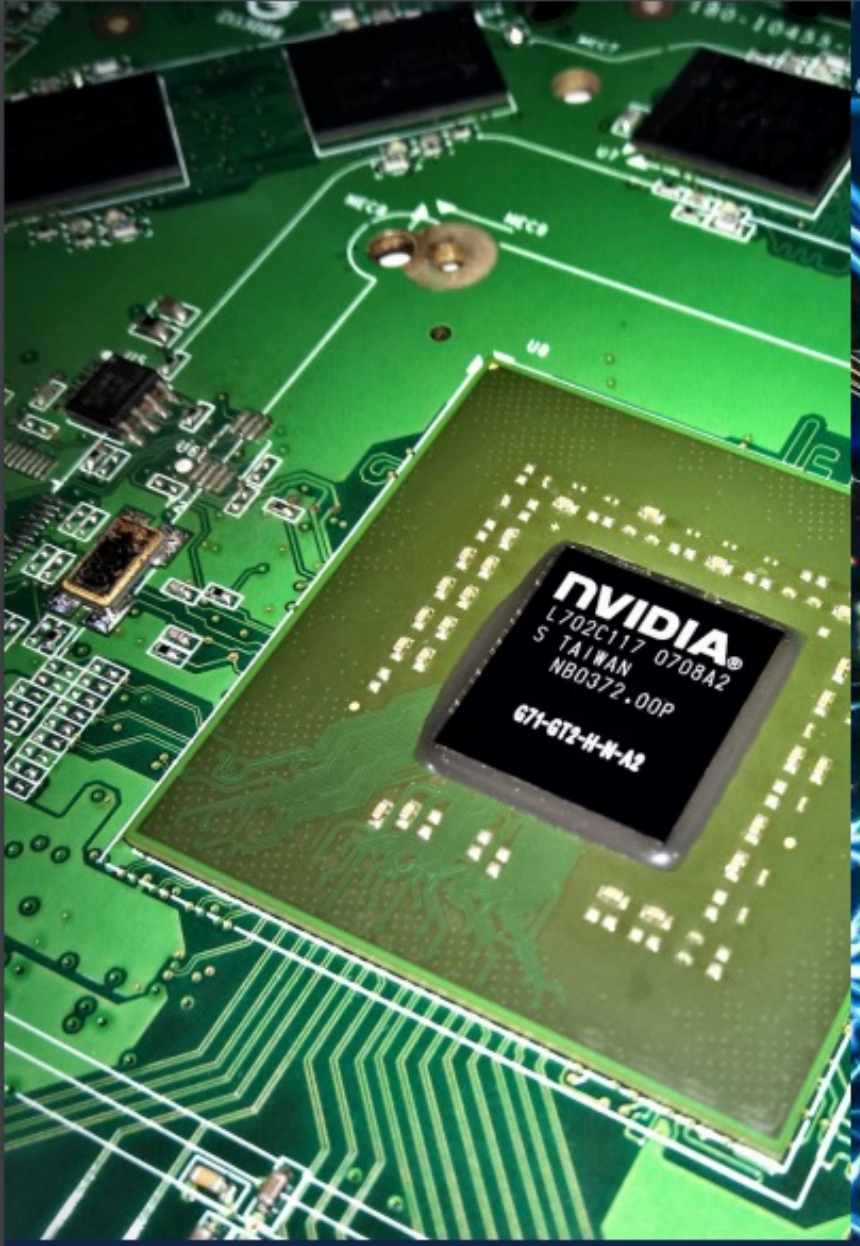
Pérez and the others then ventured further into the valley. "By the time we reached the top of one peak, the water looked blue, with some crystals on top," said Pérez.

Computer Vision

Text and Speech

Control

Slides borrowed from deepmind



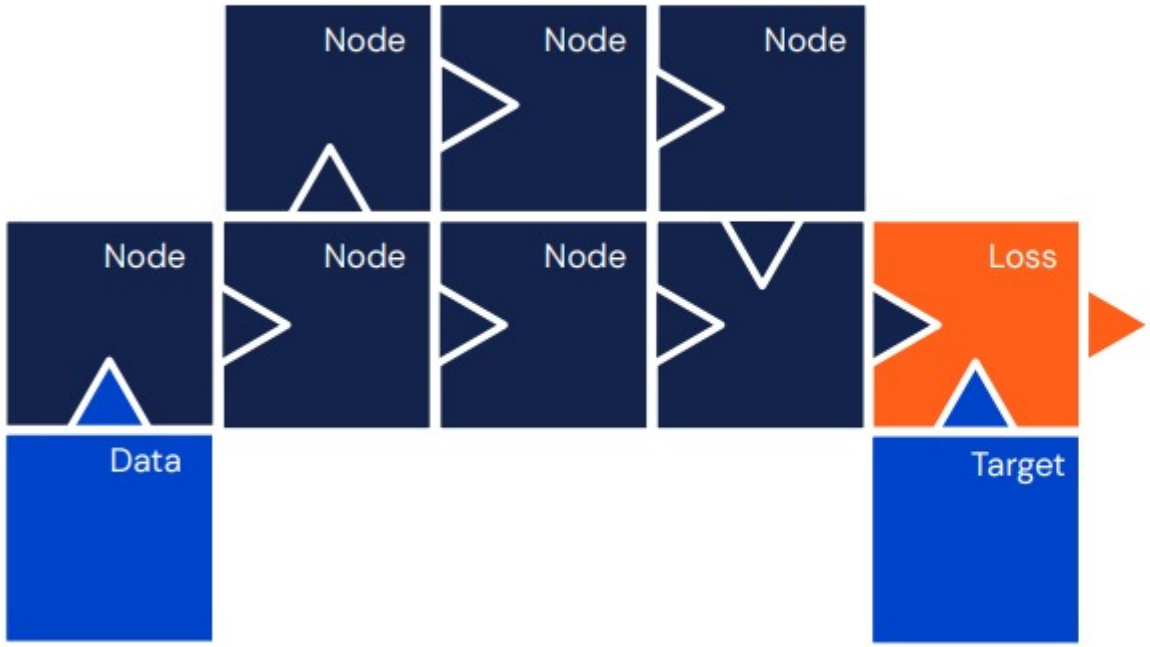
Compute

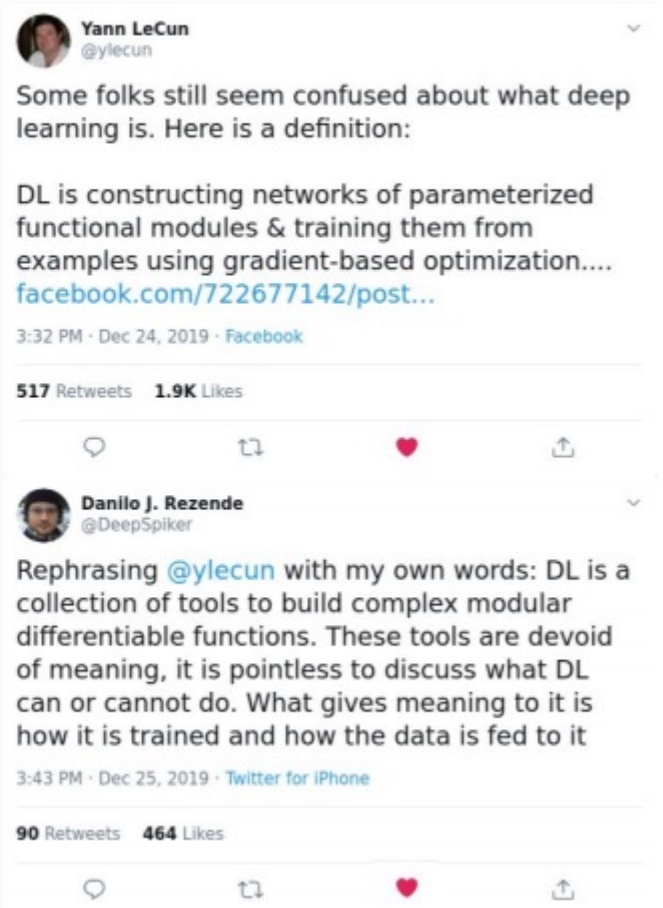
Data

Modularity

Slides borrowed from deepmind

Deep Learning is a puzzle





Yann LeCun
@ylecun

Some folks still seem confused about what deep learning is. Here is a definition:

DL is constructing networks of parameterized functional modules & training them from examples using gradient-based optimization.... facebook.com/722677142/post...

3:32 PM · Dec 24, 2019 · Facebook

517 Retweets **1.9K** Likes

Danilo J. Rezende
@DeepSpiker

Rephrasing @ylecun with my own words: DL is a collection of tools to build complex modular differentiable functions. These tools are devoid of meaning, it is pointless to discuss what DL can or cannot do. What gives meaning to it is how it is trained and how the data is fed to it

3:43 PM · Dec 25, 2019 · Twitter for iPhone

90 Retweets **464** Likes

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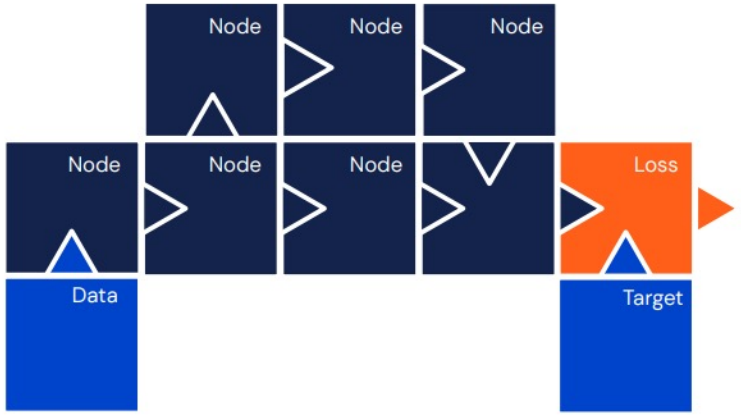
- Day 1: Basic Building Blocks
  - Fully-Connected Layer
  - Activation Function
  - Optimization
  - [HW] Logistic Regression vs MLP



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  - Case Study for ImageNet Challenge
  - [HW] Advanced CNN

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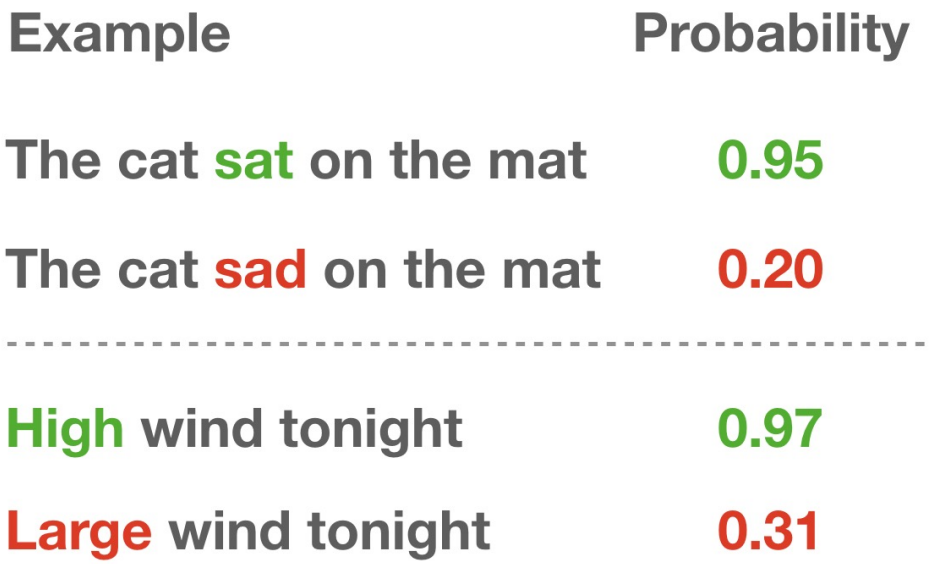
- Day 4: Blocks for Sequential Data (i.e., speech, text)
  - Recurrent Layer
  - [HW] RNN



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- Day 6: Integrating the Building Blocks
  - Image Captioning
  - Attention
  - [HW] Image Captioning

"man in black shirt is playing guitar."

"construction worker in orange safety vest is working on road."

"two young girls are playing with lego toy."

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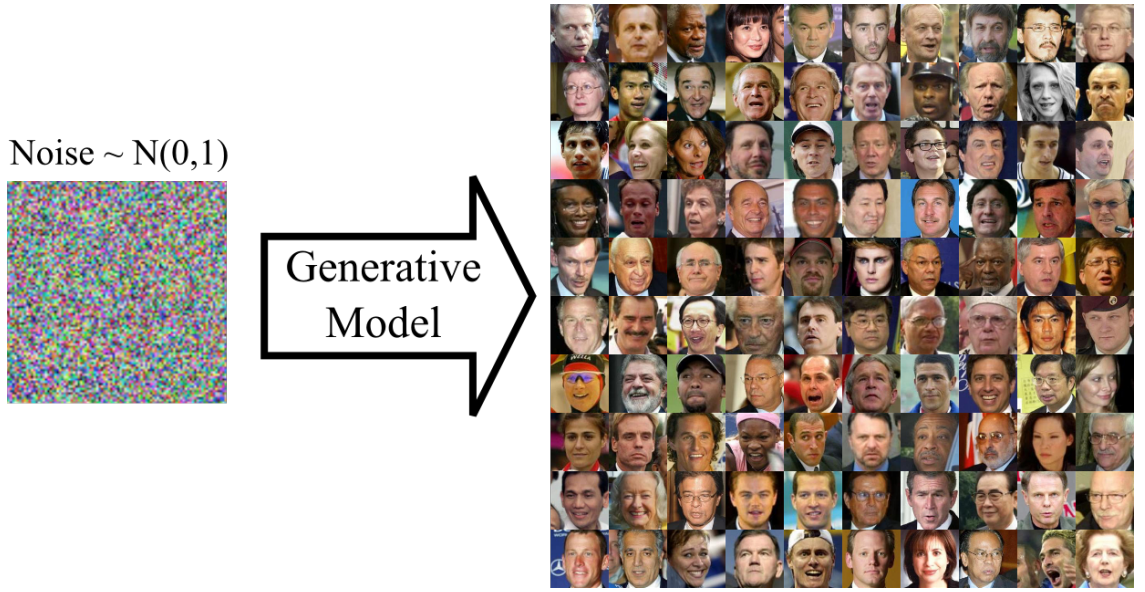
  - [HW] Image Captioning
- Day 7: Generation without Labels
  - Generative Adversarial Network
  - [HW] GAN



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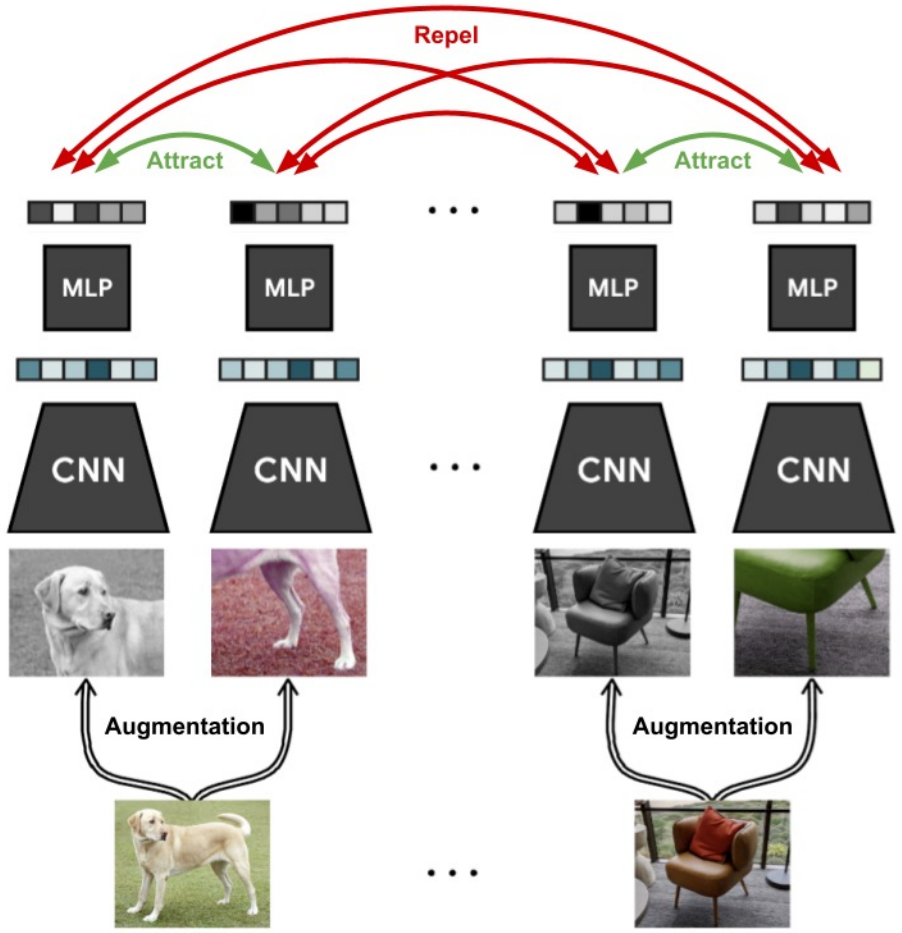
- Day 8: Representation Learning without Labels
  - Transfer Learning
  - Self-Supervised Learning
  - [HW] SimCLR



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THANK YOU!