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Build an Image Classification Model with PyTorch

—

Sidra Ahmed
Developer Advocate, UAE

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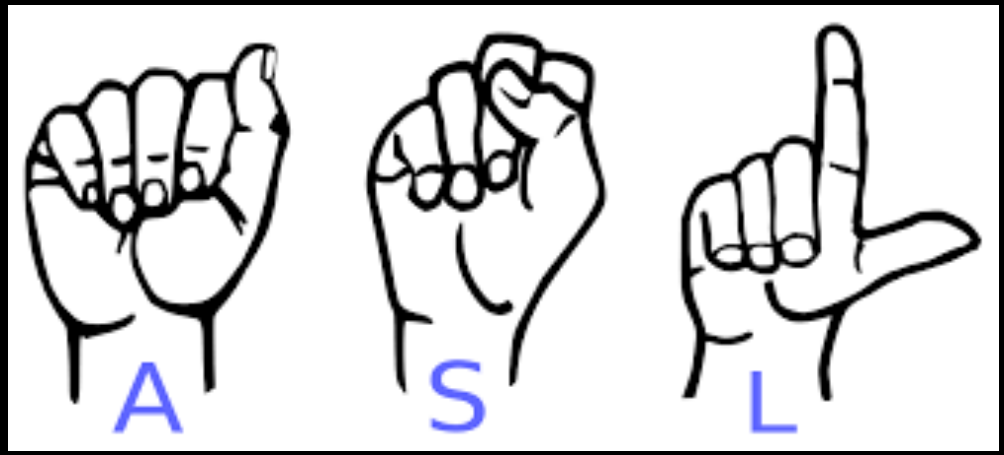
Developer Advocate, UAE



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Let’s get started

- Sign up/Log in to your IBM Cloud Account https://ibm.biz/PyTorchImage
- Resources & hands-on https://ibm.biz/PyTorchResources

Agenda

What is Deep Learning? **05**
Applications of Deep Learning 06

Neural Networks **07**
Convolutional Neural Networks 08

What is PyTorch? 10
Why PyTorch? 11
Pytorch modules 12

Hands On **13**

Tools and Frameworks **14**

Helpful Resources **15**

What is **Deep Learning?**

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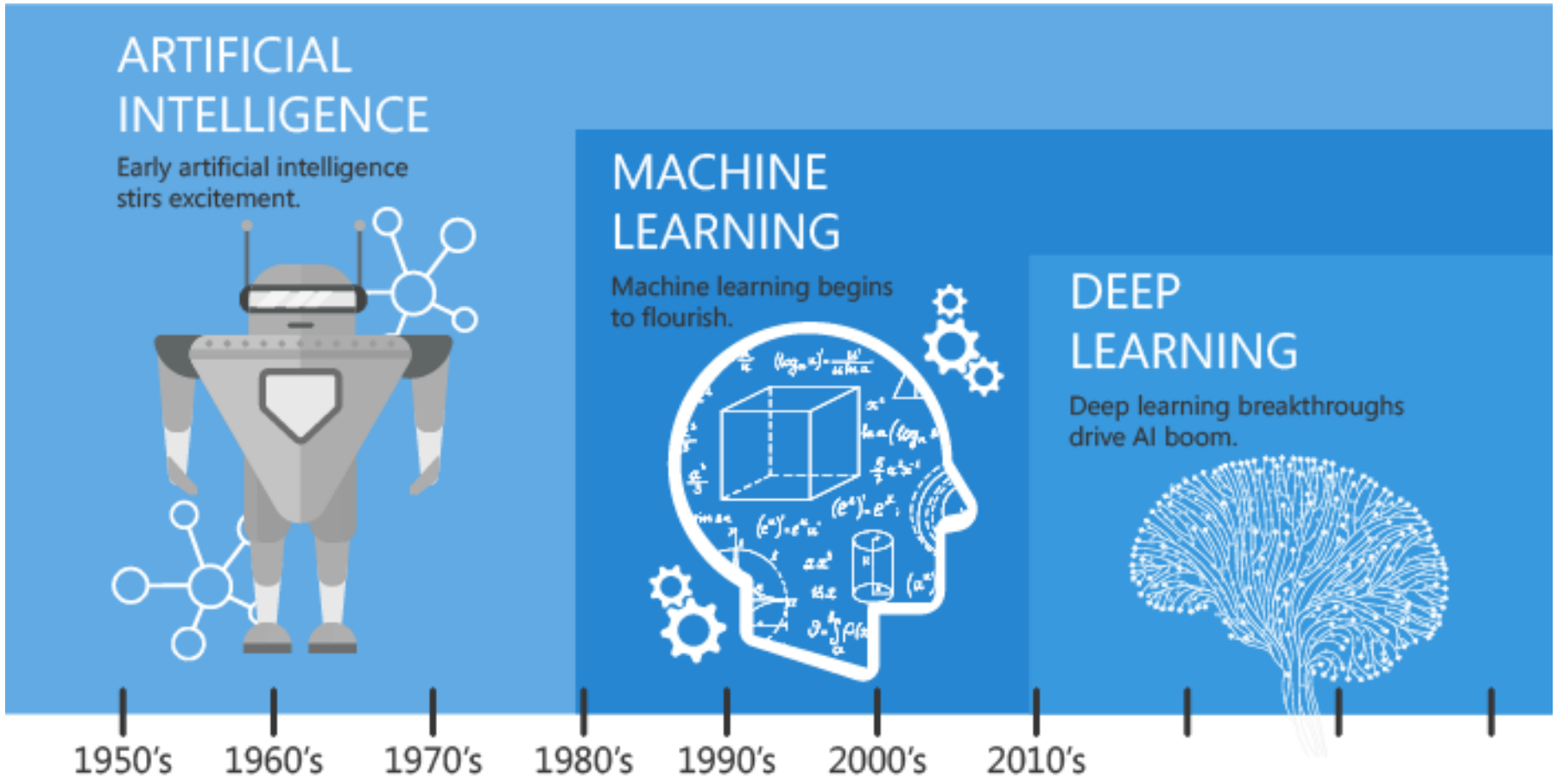
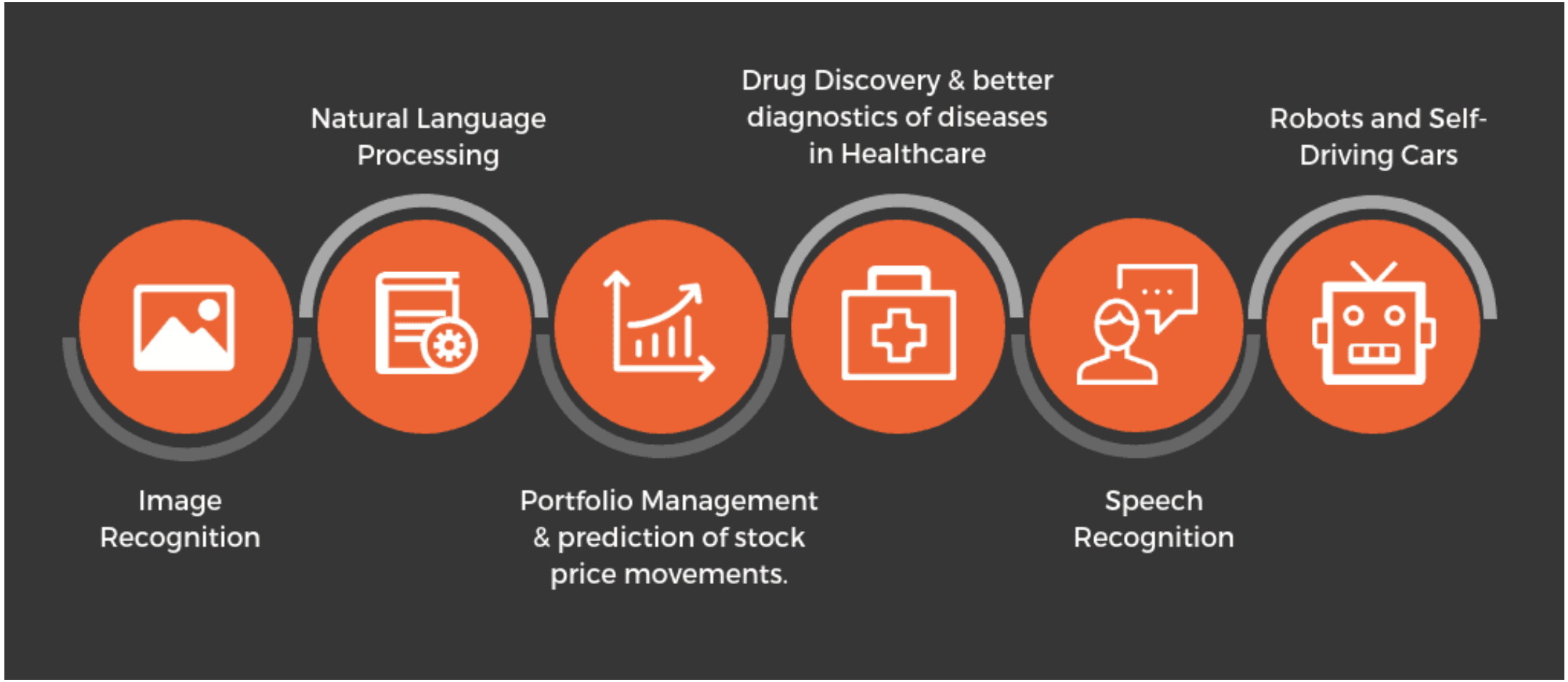


Since an early flush of optimism in the 1950's, smaller subsets of artificial intelligence - first machine learning, then deep learning, a subset of machine learning - have created ever larger disruptions.

Retrieved from https://towardsdatascience.com/artificial-intelligence-vs-machine-learning-vs-deep-learning-2210ba8cc4ac

Applications of Deep Learning



Retrieved from https://www.houseofbots.com/news-detail/11881-1-here-are-some-amazing-deep-learning-applications

Neural Networks

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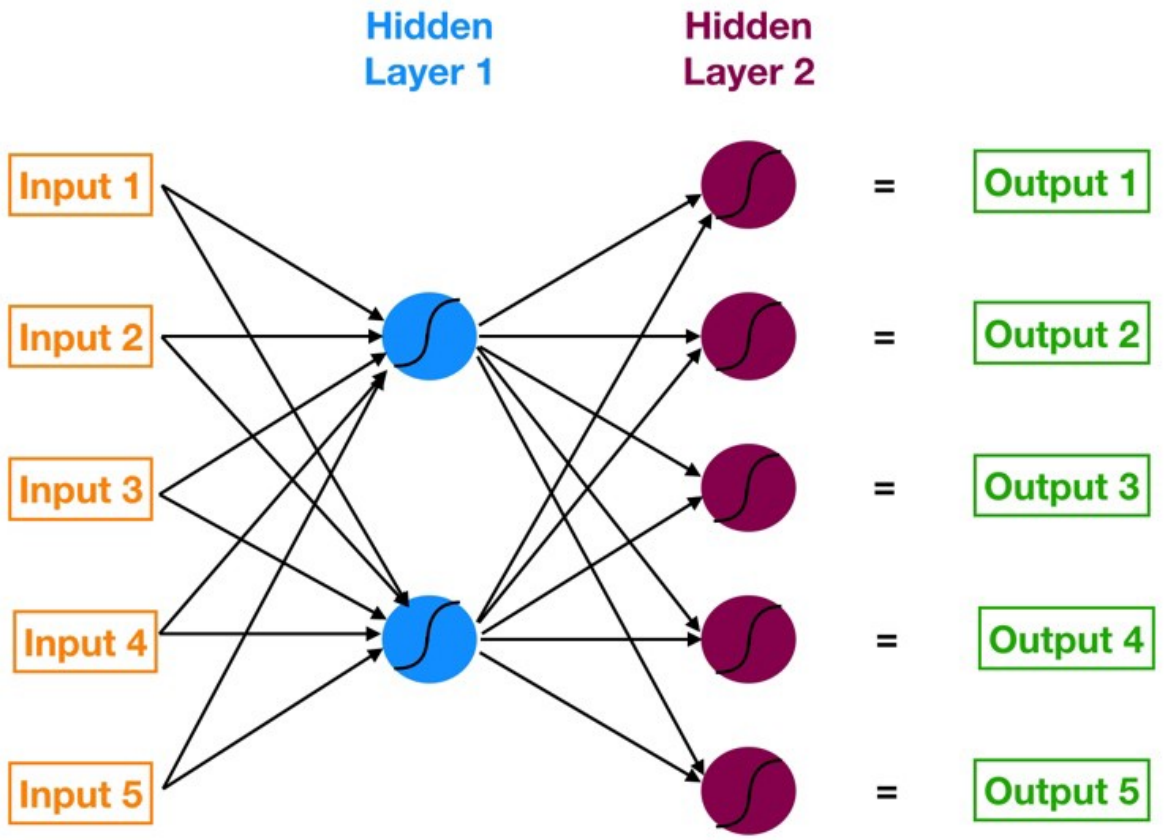
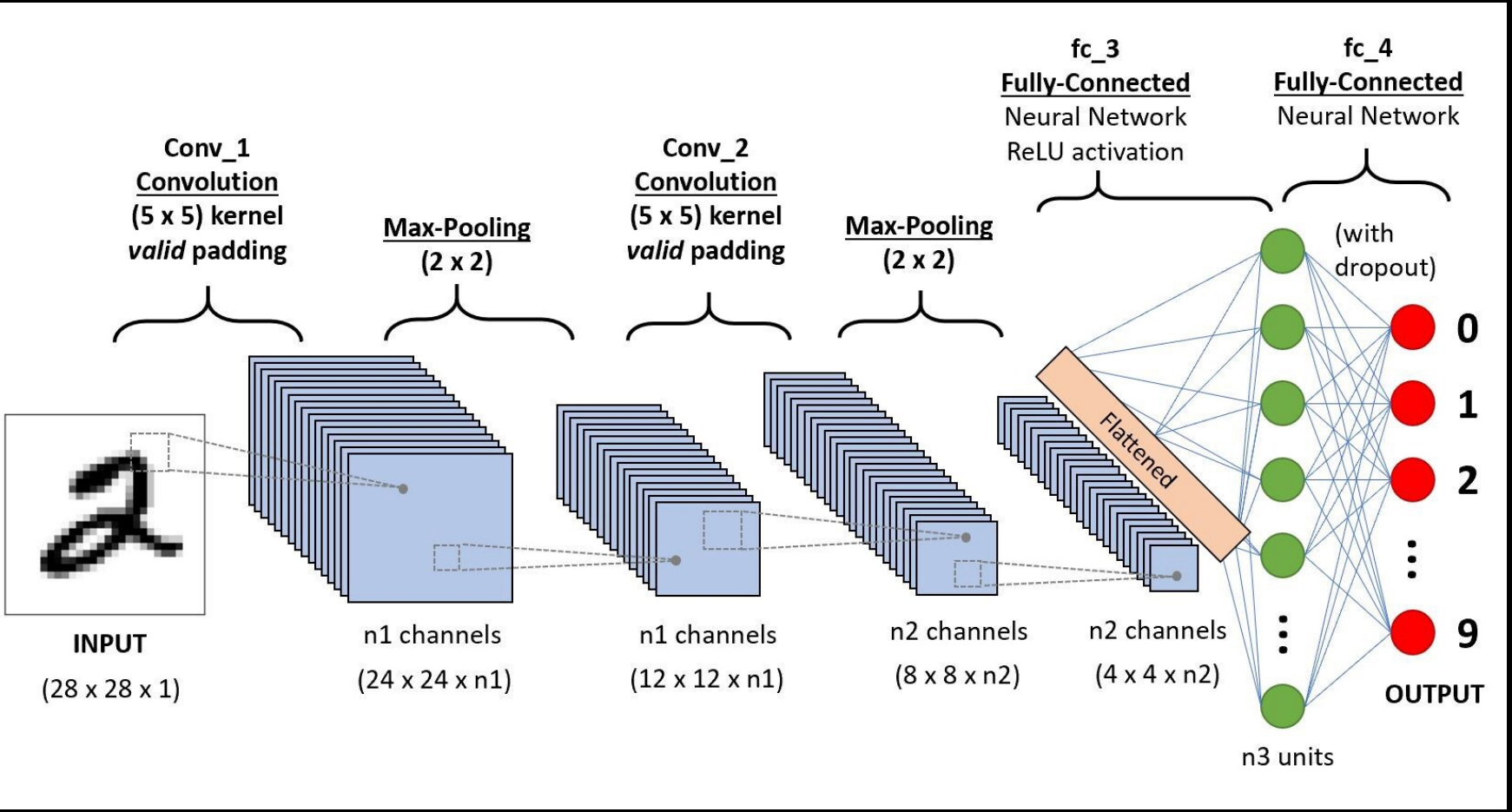
- Multi-layer networks of neurons that we use to classify things, make predictions
- Architecture inspired by the neurons in the brain
- Made up of different layers: input, hidden and output
- Can easily handle time series data or multidimensional data
- The more hidden layers, the more accuracy
- Requires very large amounts of data
- Expensive to train
- “Black box” nature



Retrieved from https://towardsdatascience.com/understanding-neural-networks-19020b758230

https://playground.tensorflow.org/

Convolutional Neural Networks



Retrieved from https://towardsdatascience.com/a-comprehensive-guide-to-convolutional-neural-networks-the-eli5-way-3bd2b1164a53

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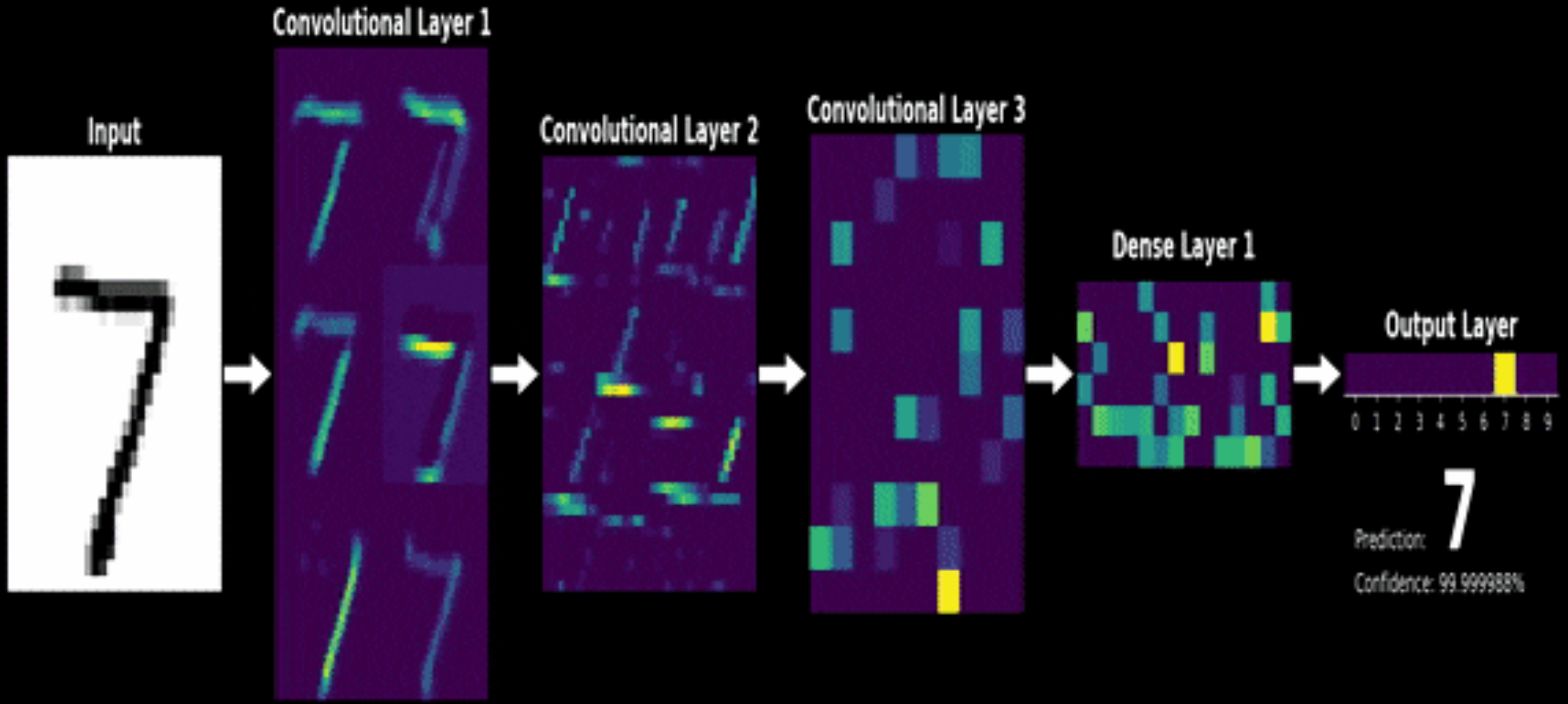

Retrieved from https://gfycat.com/affectionatememorablegreyhounddog-artificial-intelligence-neural-networks

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Introduction to PyTorch

- PyTorch is an open source deep learning framework and scientific computing package based on Python
- Tensor computation (like NumPy) with strong GPU acceleration
- Automatic differentiation for building and training neural networks
- Heavily used by tech giants such as Facebook, Twitter, NVIDIA, Uber etc

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Why **PyTorch?**

- Dynamic computational graphs
- Diverse backend support
- Imperative Style
- Highly Extensible
- Python-centric approach

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A few **PyTorch modules**

Package	Description
torch	The top-level PyTorch package and tensor library.
torch.nn	A subpackage that contains modules and extensible classes for building neural networks.
torch.autograd	A subpackage that supports all the differentiable Tensor operations in PyTorch.
torch.nn.functional	A functional interface that contains typical operations used for building neural networks like loss functions, activation functions, and convolution operations.
torch.optim	A subpackage that contains standard optimization operations like SGD and Adam.
torch.utils	A subpackage that contains utility classes like data sets and data loaders that make data preprocessing easier.
torchvision	A package that provides access to popular datasets, model architectures, and image transformations for computer vision.

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Hands-On

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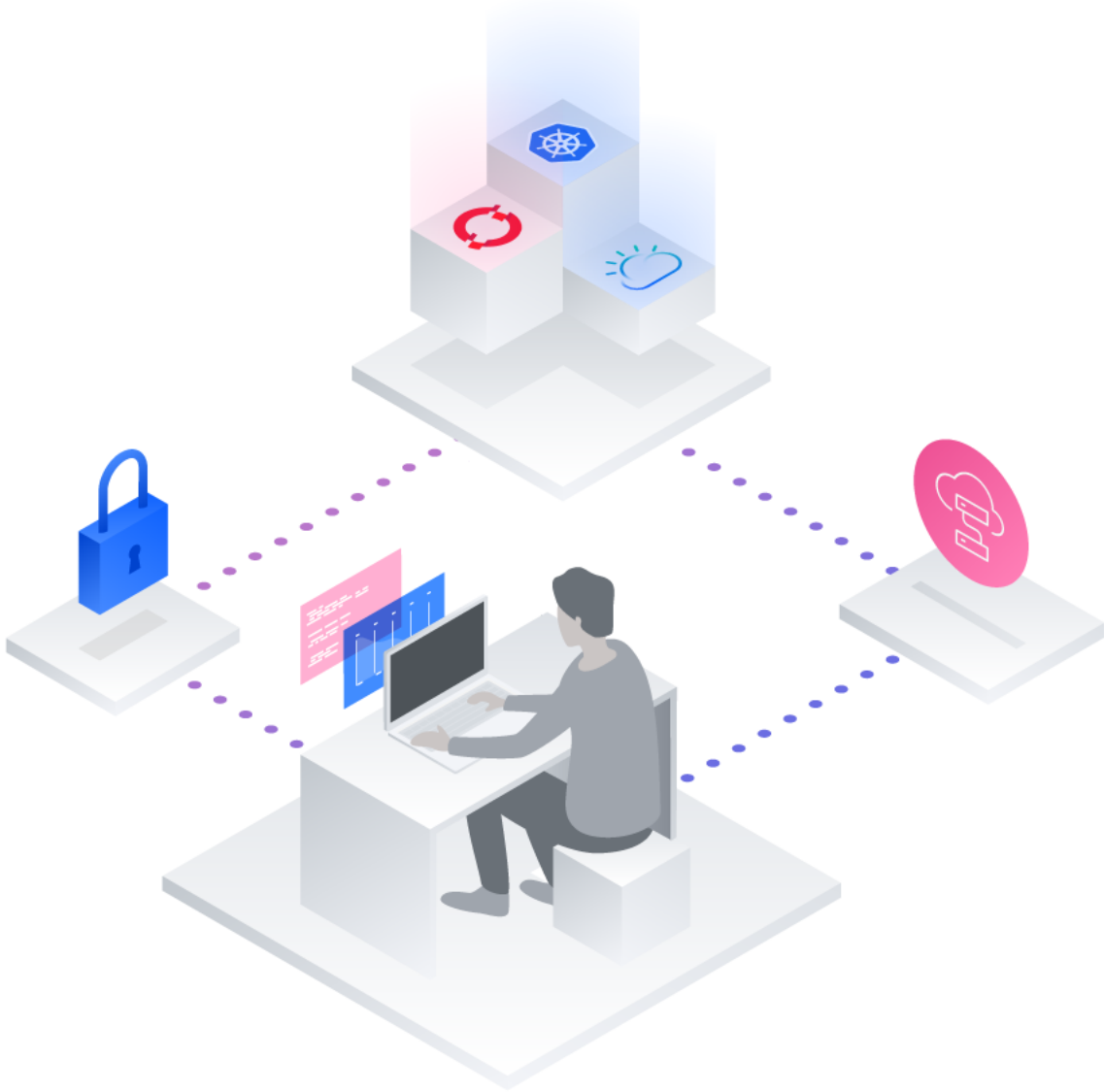

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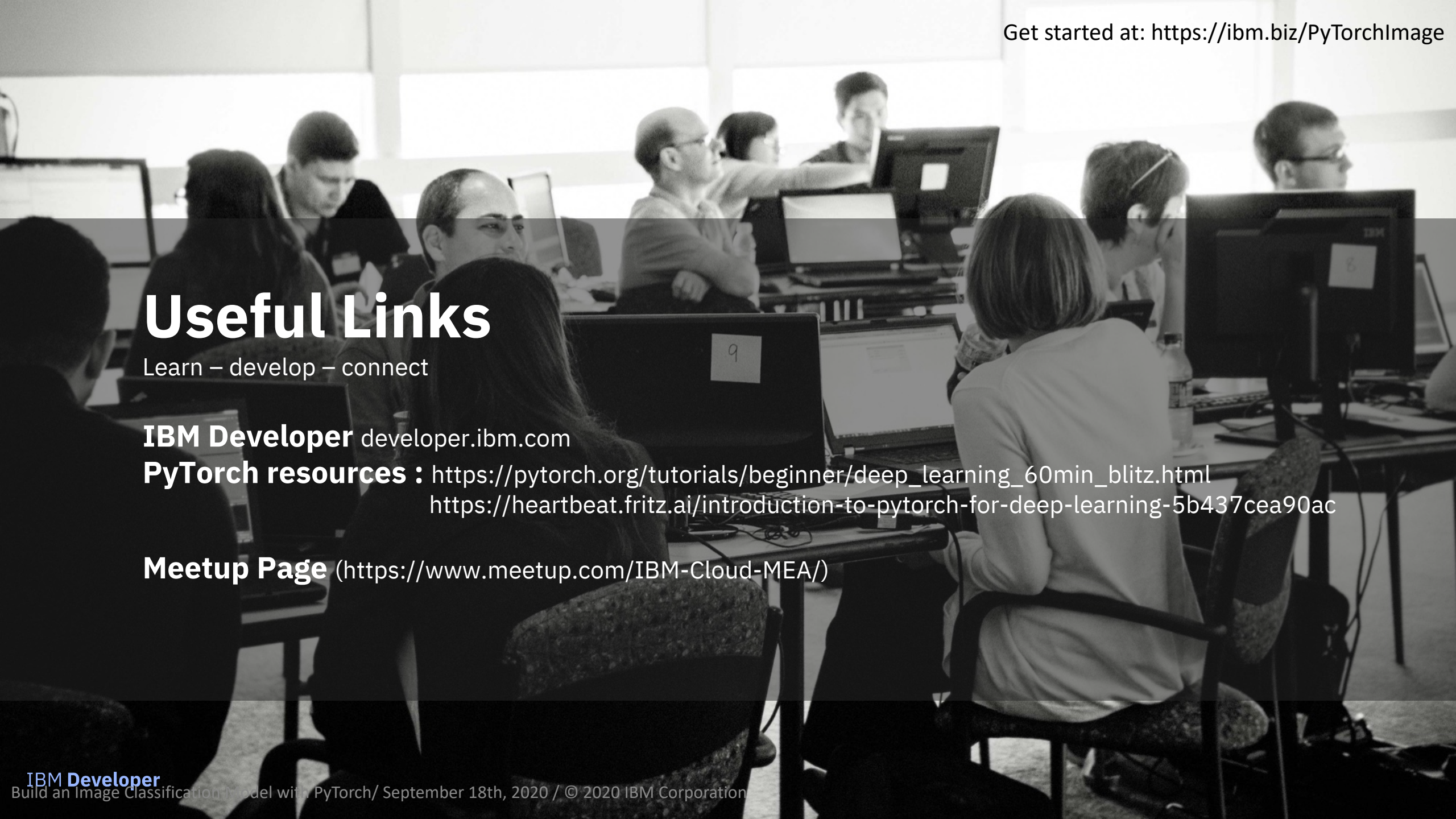

Useful Links

Learn – develop – connect

IBM Developer developer.ibm.com

PyTorch resources : https://pytorch.org/tutorials/beginner/deep_learning_60min_blitz.html
https://heartbeat.fritz.ai/introduction-to-pytorch-for-deep-learning-5b437cea90ac

Meetup Page (https://www.meetup.com/IBM-Cloud-MEA/)

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Thank you

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