

Machine Learning with TensorFlow.js and IBM Watson Webinar

—
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Hi, I'm Dave

I'm a developer advocate for IBM in San Francisco. I also help organize:

- The SF JavaScript Meetup
- IBM Developer SF Meetup
- ForwardJS San Francisco && Ottawa

I participate in meetups, hackathons, webinars and write articles about technology for IBM and other organizations.

Warning: I am a lowly developer

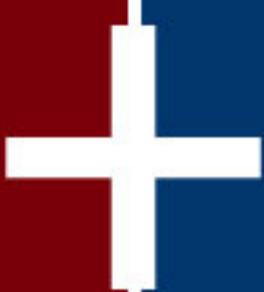


Agenda

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↳ The Machine Learning Ecosystem



Projected market for machine learning technologies, 2024

Source: [Forbes](#)

\$30.6B

Enterprises who use ten or more AI applications

Source: [Forbes](#)

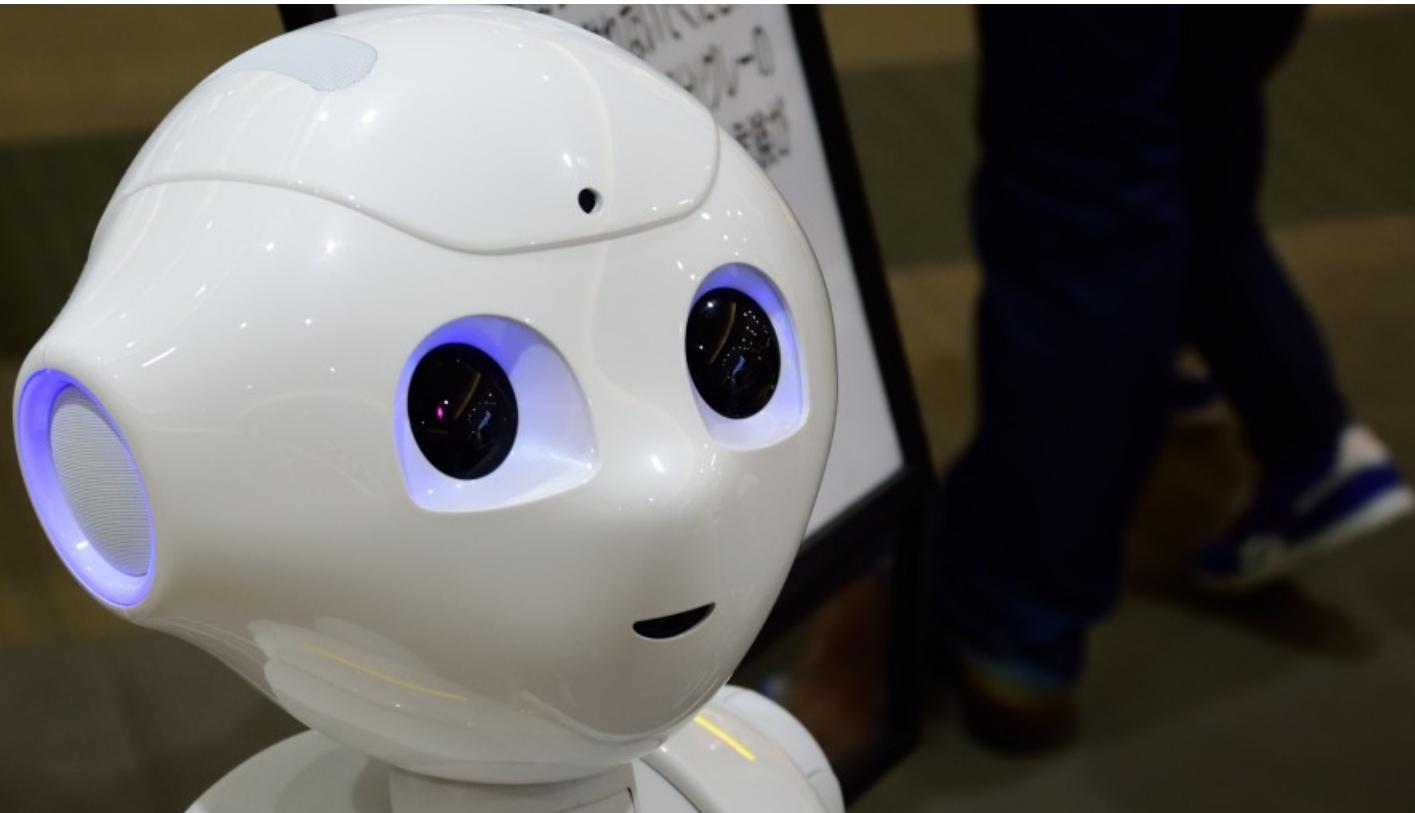
10%

Total investment in machine learning
applications in Q1 2019

\$28 . 5B

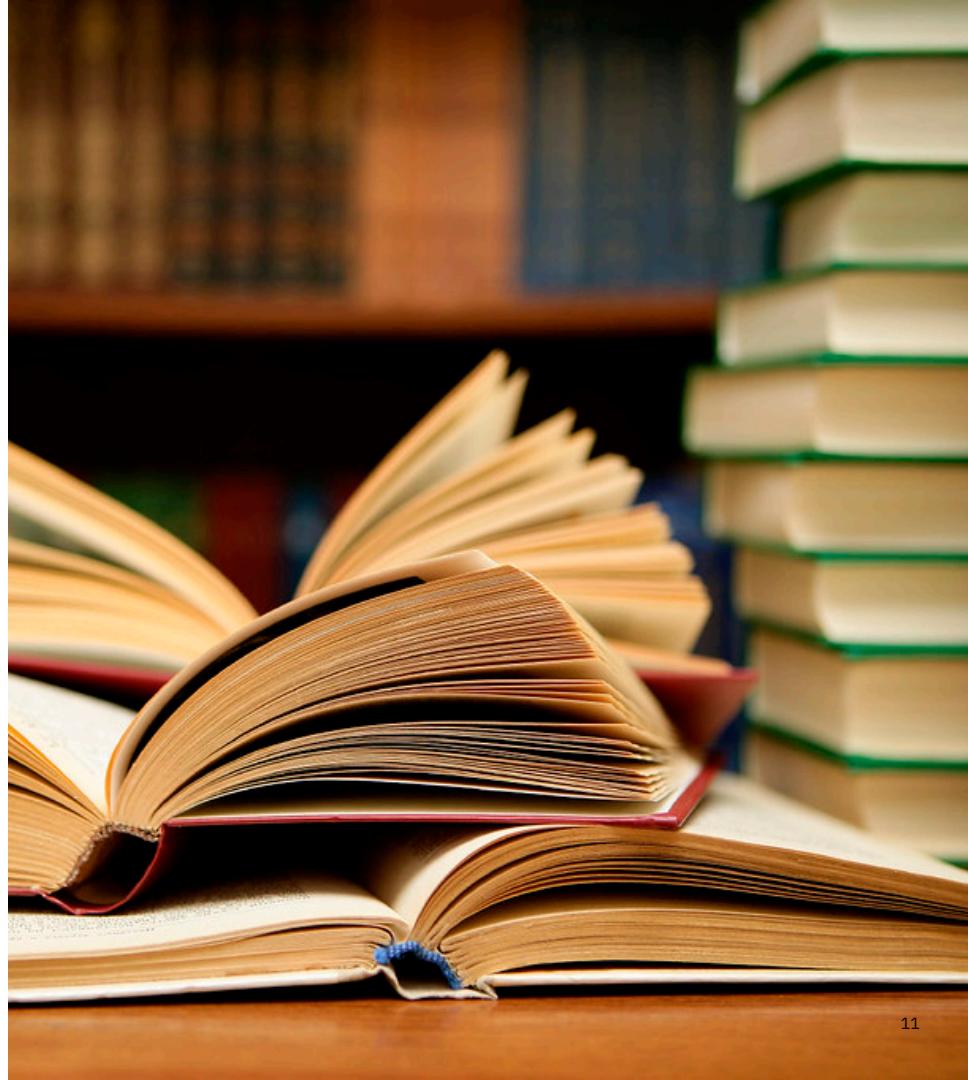
Source: [Forbes](#)

↳ What Is Machine Learning?



Machine Learning Defined

“Machine learning (ML) is the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model based on sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to perform the task.”



Examples of Machine Learning

- Virtual Personal Assistants
- Email/Spam Filtering
- Chatbots/Online Support
- Video Surveillance
- Maps/Traffic/Time to Arrival
- Speech Recognition
- Recommendation Engines

“Machine learning (ML) is the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead.”

Deep Learning Defined

“Deep learning architectures such as deep neural networks, deep belief networks, recurrent neural networks and convolutional neural networks have been applied to fields including computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics, drug design, medical image analysis, material inspection and board game programs, where they have produced results comparable to and in some cases surpassing human expert performance.”



Artificial Intelligence Defined

“A system’s ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation.”



Let's Recap: Definitions

Artificial Intelligence (AI) - The broad discipline of creating intelligent machines

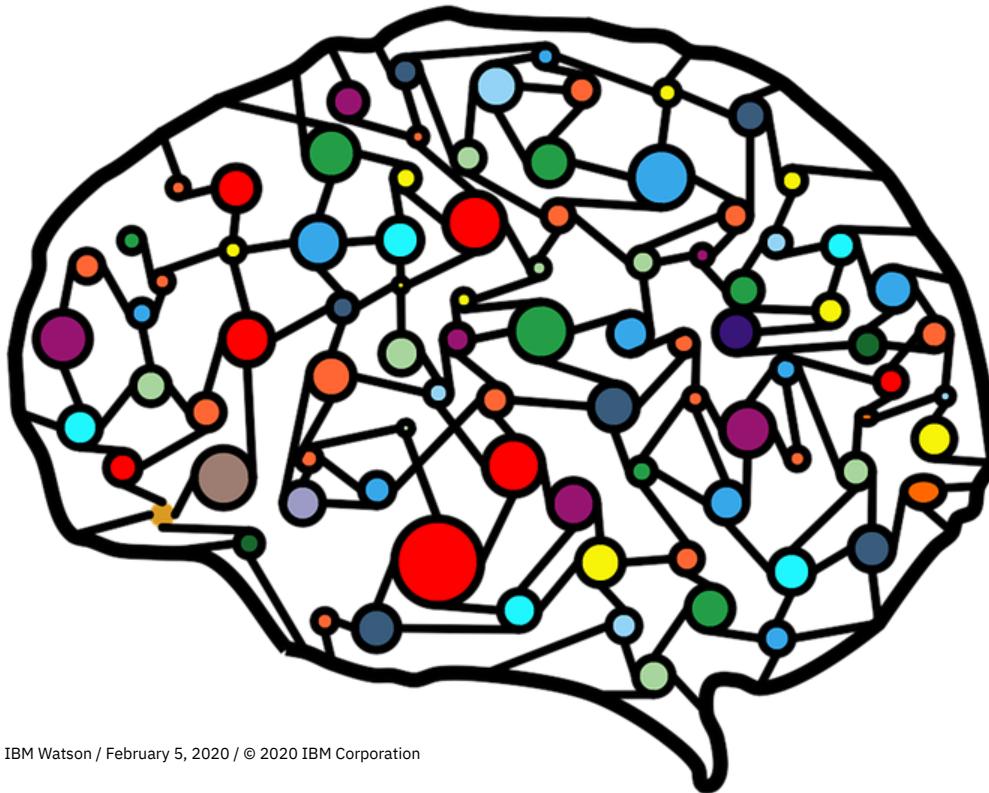
Machine Learning (ML) - Systems that can learn from experience

Deep Learning (DL) - Systems that learn from experience on large data sets

Artificial Neural Networks (ANN) - Models of human neural networks that are designed to help computers learn

Source: Sonix

↳ Let's Dive in: Artificial Neural Networks



Types of Neural Networks

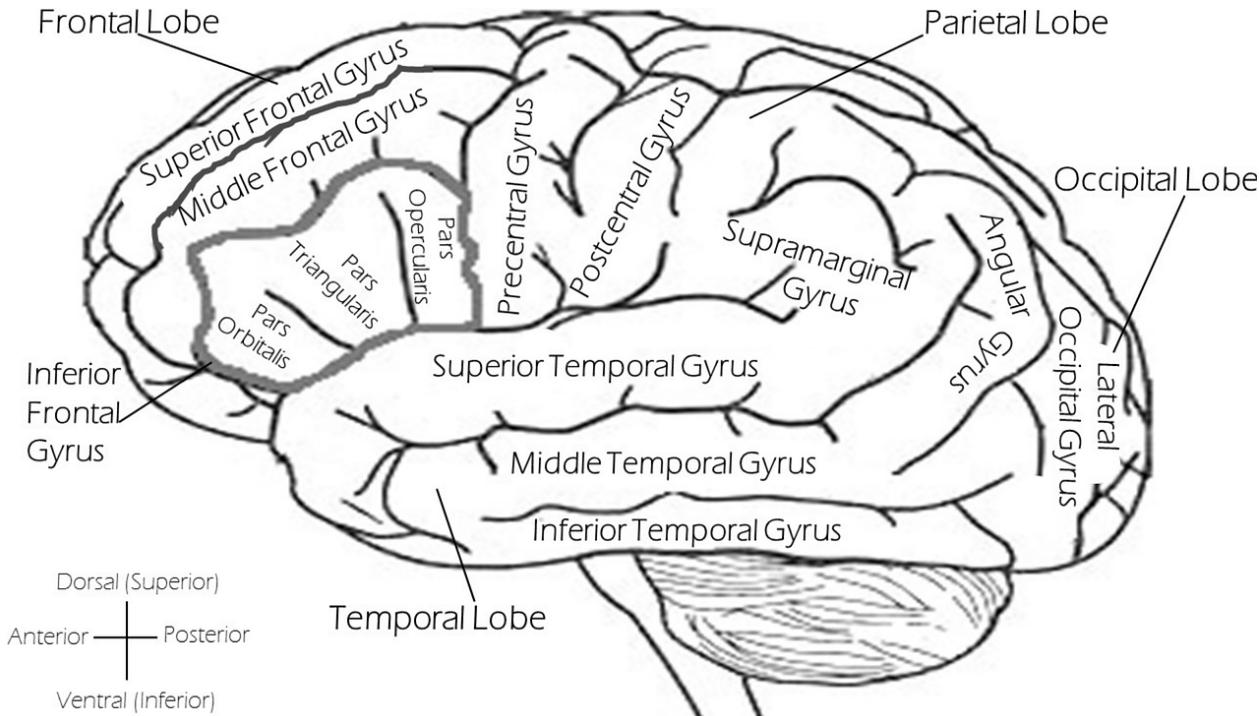
Convolutional neural networks

Long short-term memory network

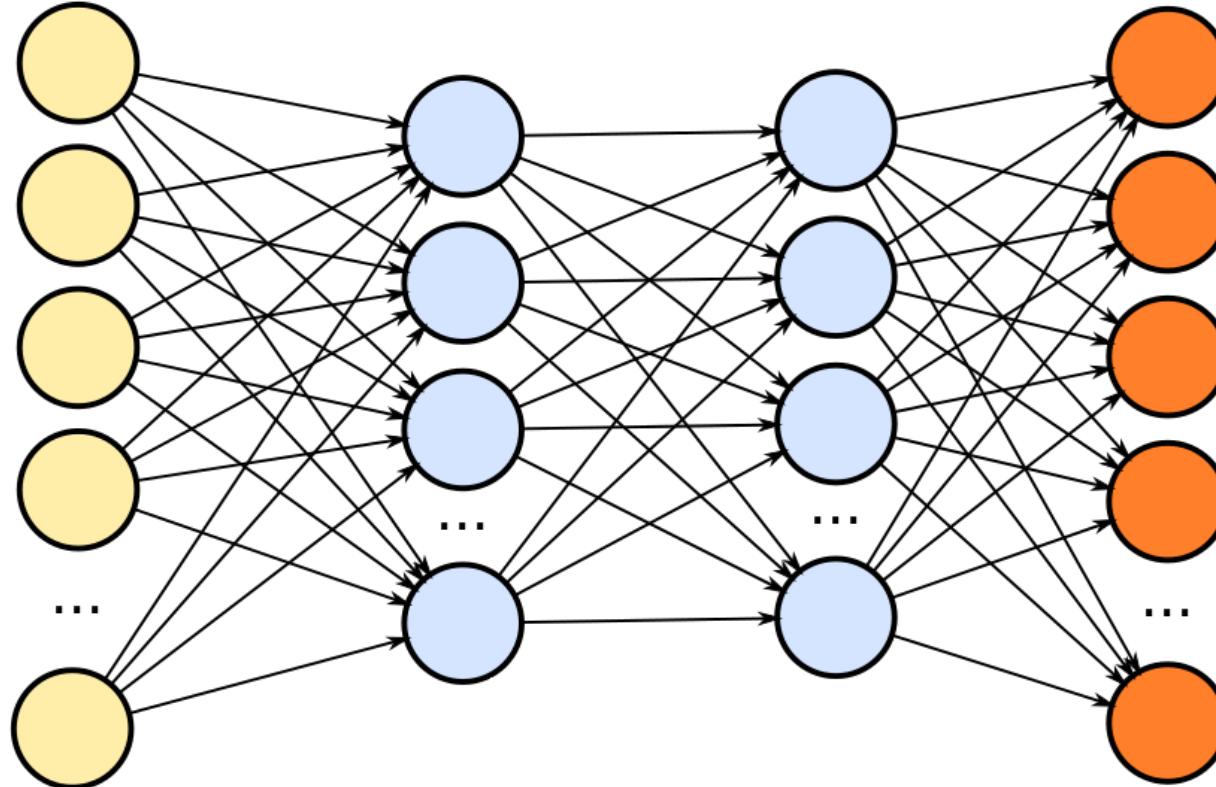
Simple/multilayer



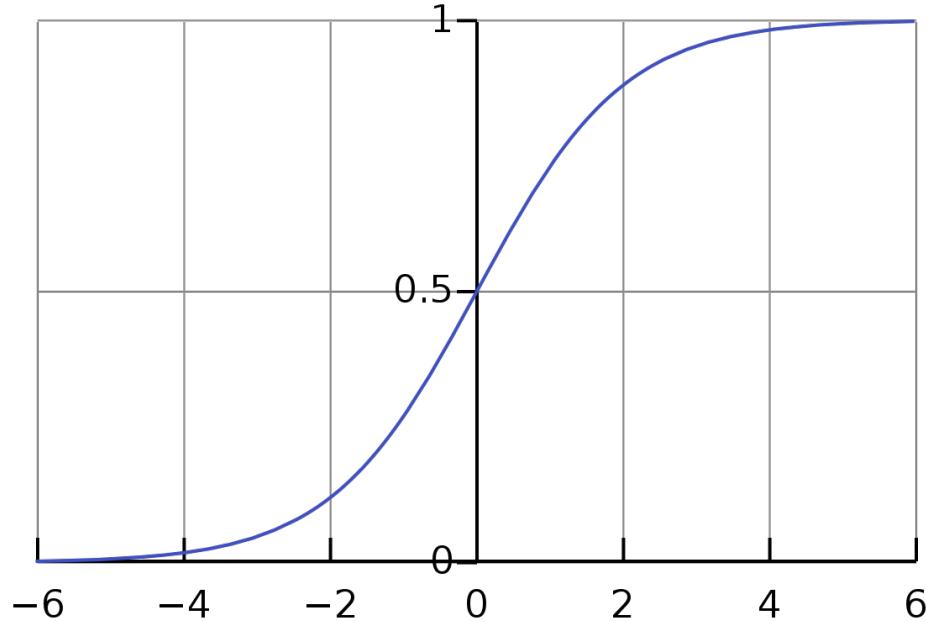
Artificial Neural Network Inspiration



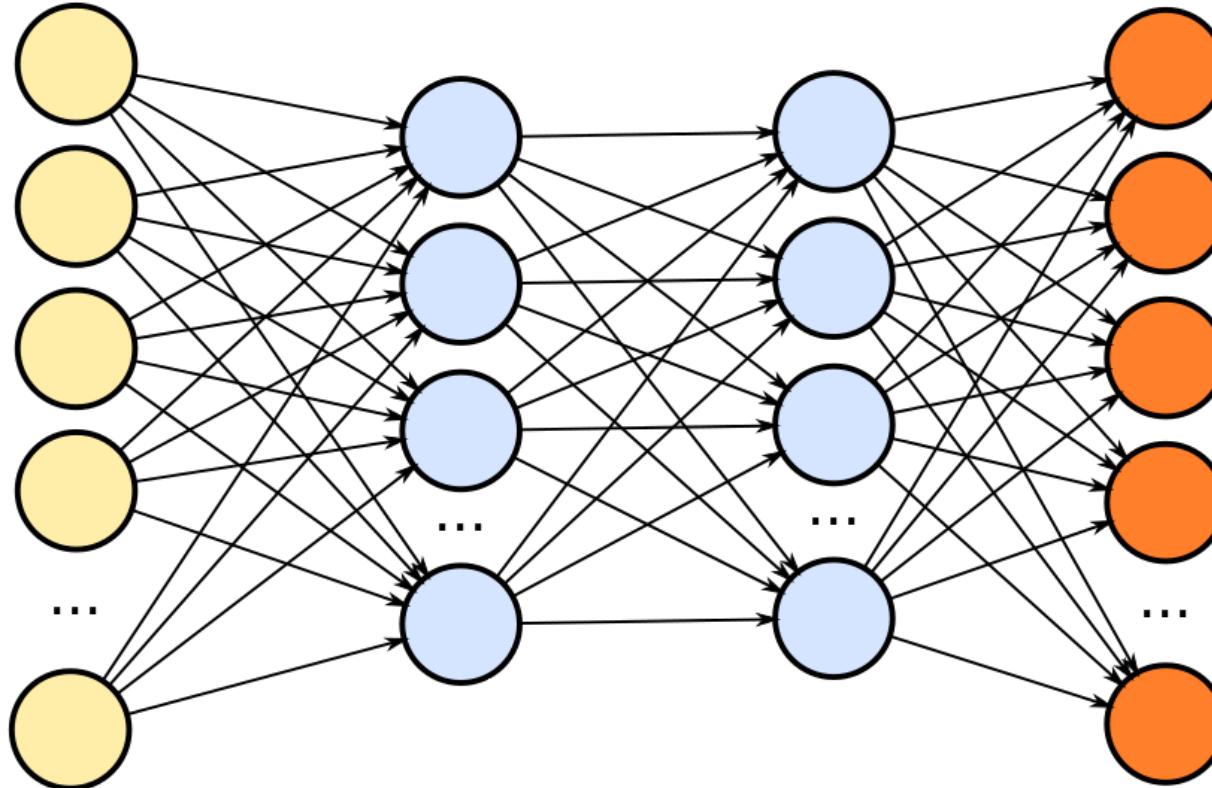
Artificial Neural Networks: Layers



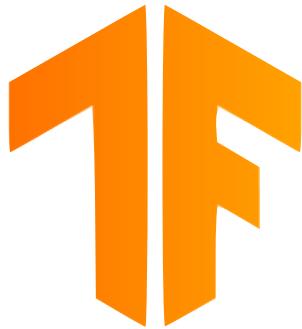
Sigmoid Function



Artificial Neural Networks: Weights & Costs



↳ What is TensorFlow?



TensorFlow

Commits made to the [TensorFlow repository](#) on GitHub

77,748

What's the difference between TensorFlow 1 and 2?



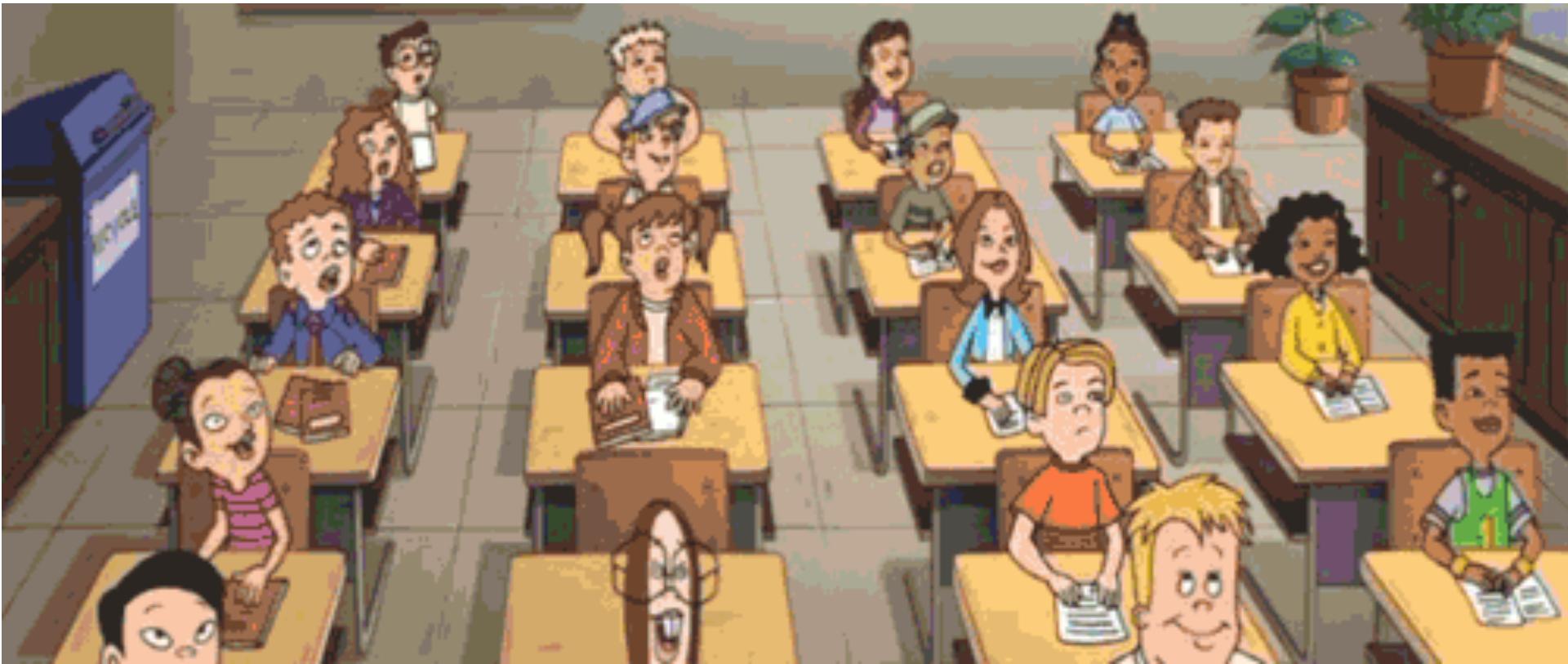
↳ What is TensorFlow?



Commits made to the tfjs repository on
GitHub

3 , 607

TensorFlow.js Demo!



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IBM Watson Demo!



Future Steps:

[Train a TensorFlow model in IBM Watson](#)

[Import Keras Models into Watson Machine Learning](#)

[Use Watson Visual Recognition](#)



Conclusion





Build Smart



Thursday, February 6

Online Meetup: Deep Learning Master Class II - Computer Vision

Wednesday, February 12

Online Meetup: Fraud Prediction using AutoAI

Thursday, February 13

DL Master Class III - Model Performance, Quantization, & Hyperparameter Search

ibm.biz/bayareaevents

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San Francisco, CA



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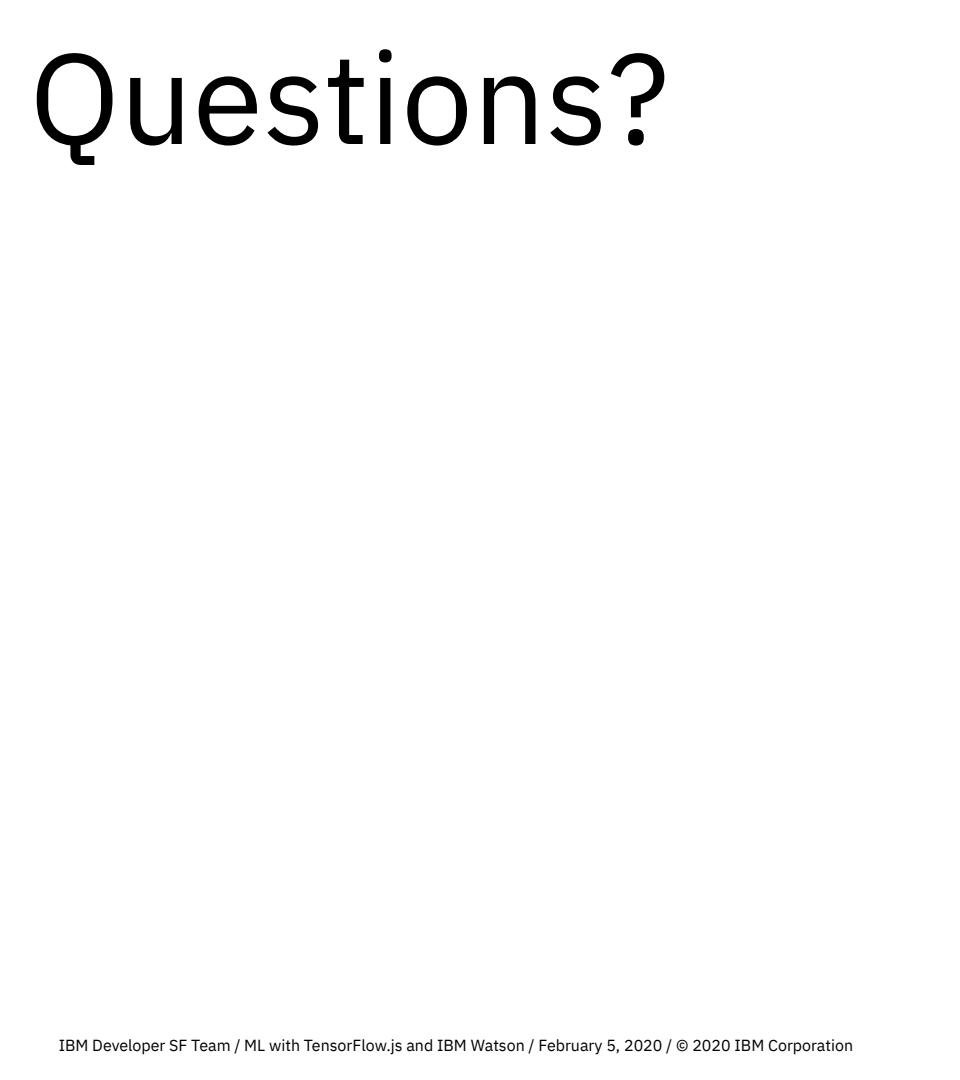
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Questions?



And... answers!

