

AI and Emerging Technologies in the Middle School

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Hosted by Pine Crest School

Sean Tibor

- Computer Science and Technology Specialist
- Fort Lauderdale Middle School
- 1st Year Teaching
- Transfer from IT and Digital Marketing Career
- Co-host of Teaching Python

@smtibor on Twitter



Pedro Uribe

- Computer Science and Technology Specialist
- Boca Raton Middle School
- Code.org Facilitator
- **Not** the FBI's Most Wanted Pedro Uribe from *Unsolved Mysteries*, Season 2, Episode 18

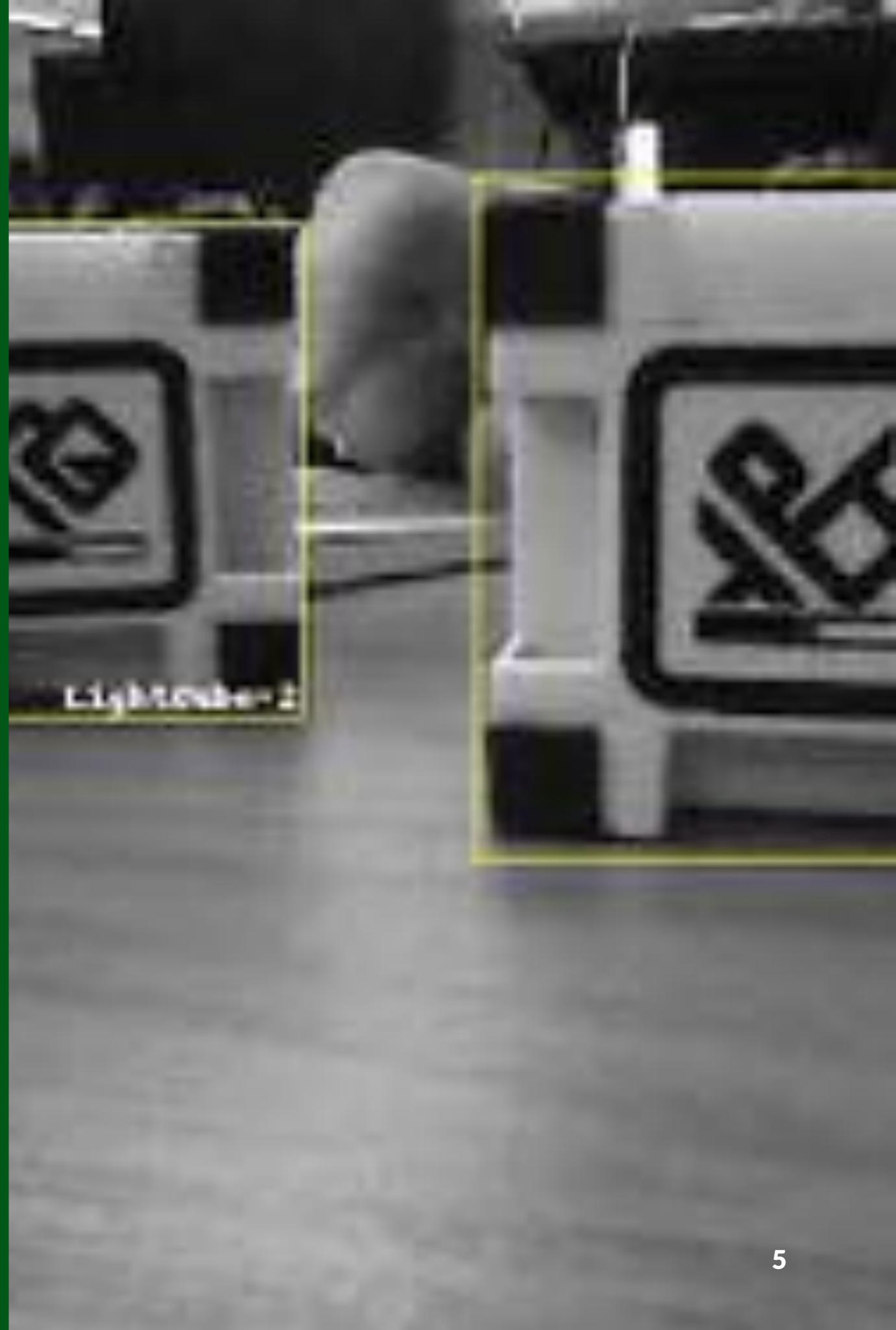


The World

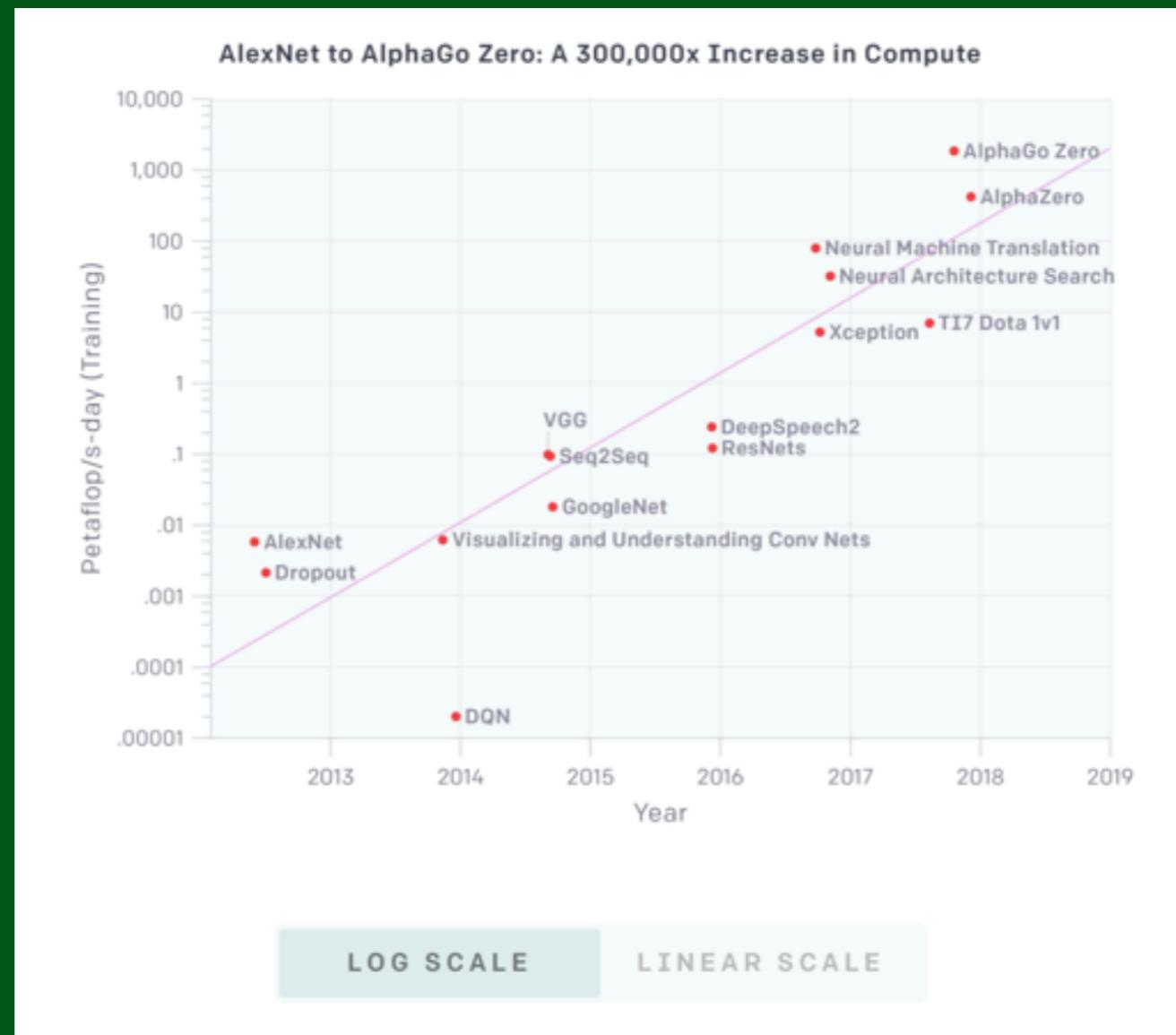
(+5 Years)

More AI

- Self Driving Cars
- Predictive Analytics
- Deep Learning
- Computer Vision



AI Compute Increased 300,000x in Six Years



More Robotics

- Manufacturing
- Healthcare
- Consumer

52% of adult internet users believe that robots will perform most human activities in 30 years.
(Brookings Institute)





Cheaper, Better VR

- Oculus Rift S
- Oculus Quest
- HTC Focus

More Capable AR

- Apple ARKit 2
- Magic Leap
- Microsoft HoloLens

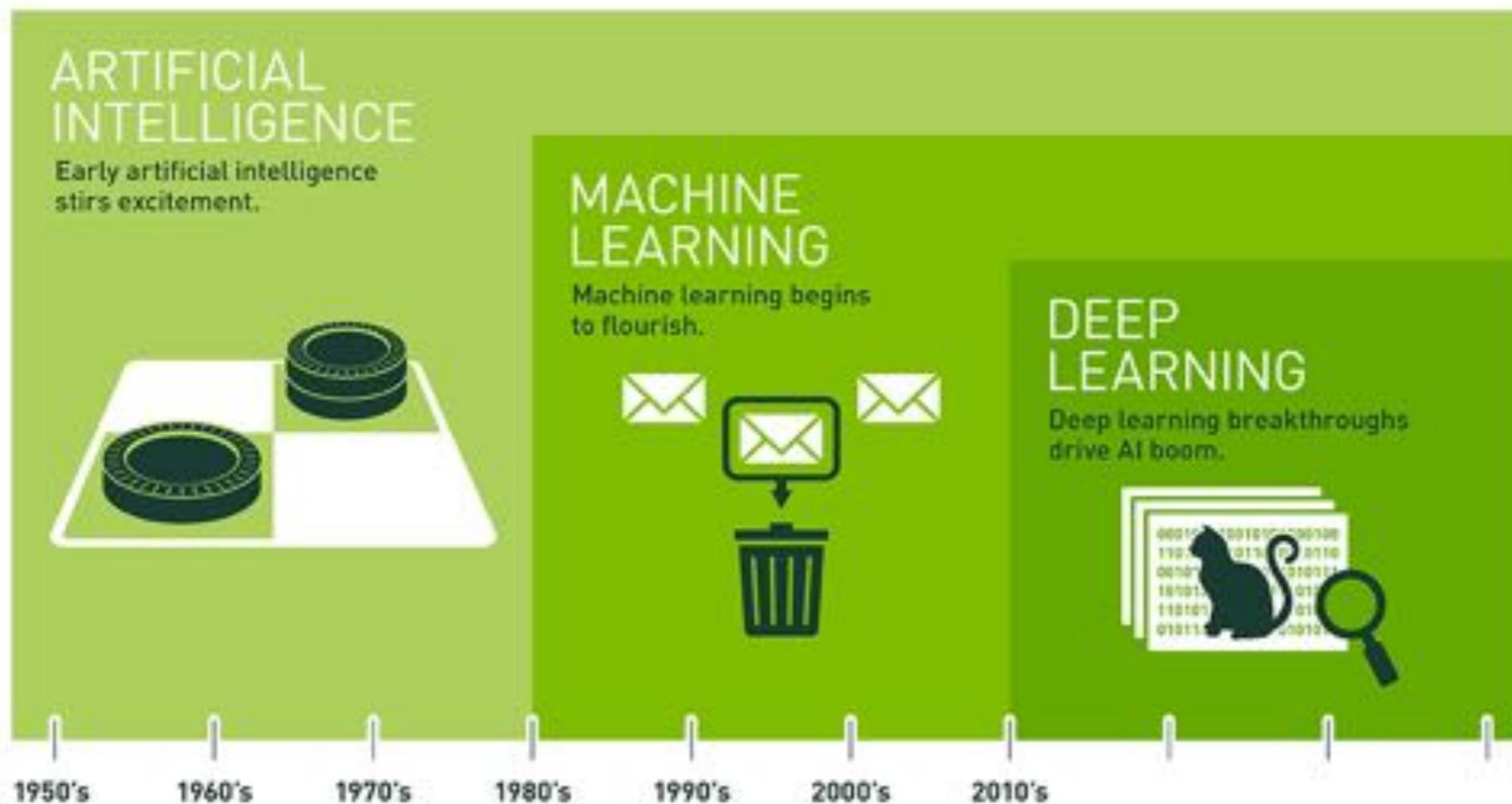


How Do We Prepare Students For A World That Doesn't Exist Yet?

A Very Brief History of AI

Artificial Intelligence?
Machine Learning?
Deep Learning?

Subsets of Artificial Intelligence



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

Artificial Intelligence

Computers perform tasks in ways that resemble humans

Machine Learning

Computers improve their performance based on data results

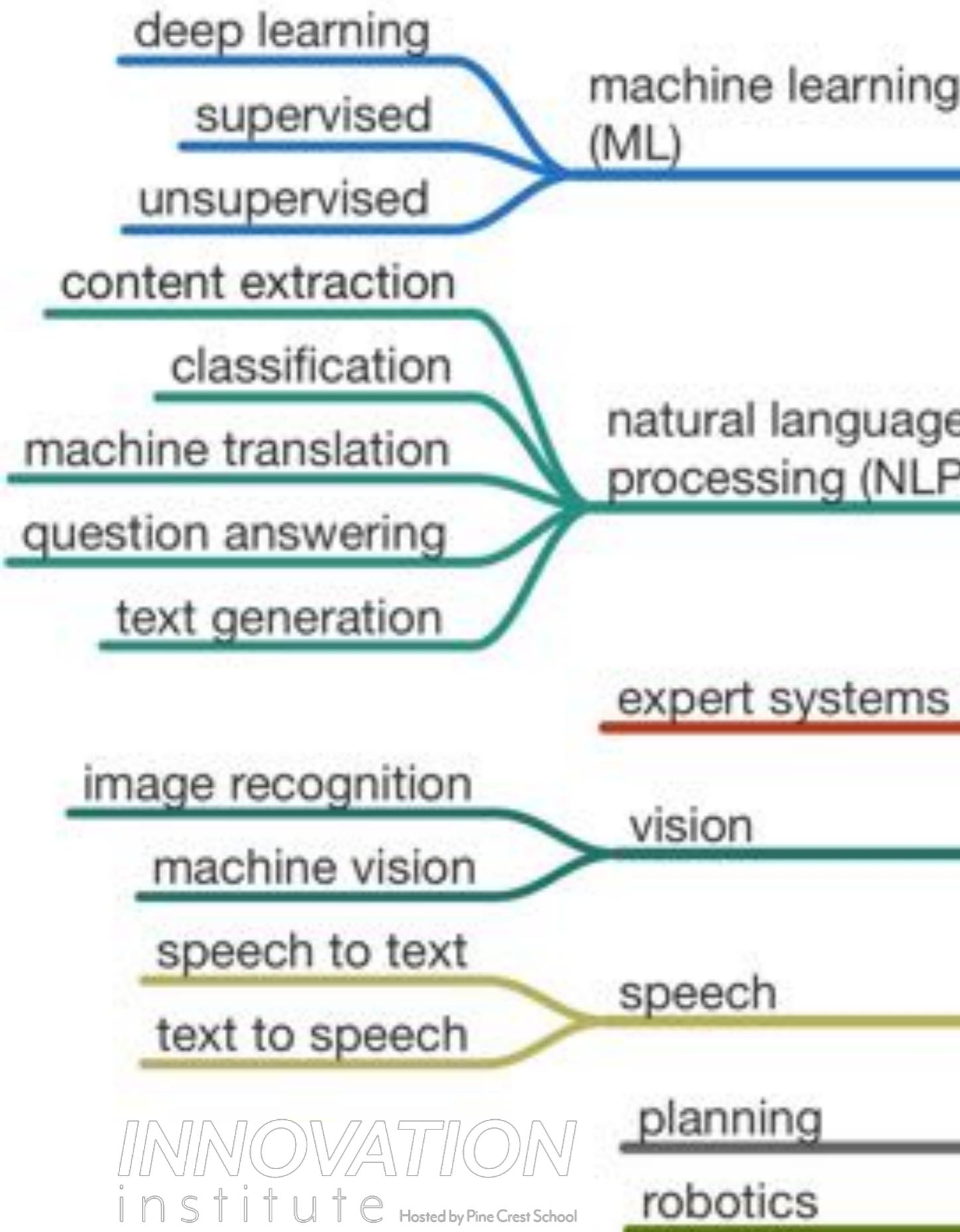
Neural Networks Deep Learning



Computers adapt to new data and learn from experience

AI Family Tree

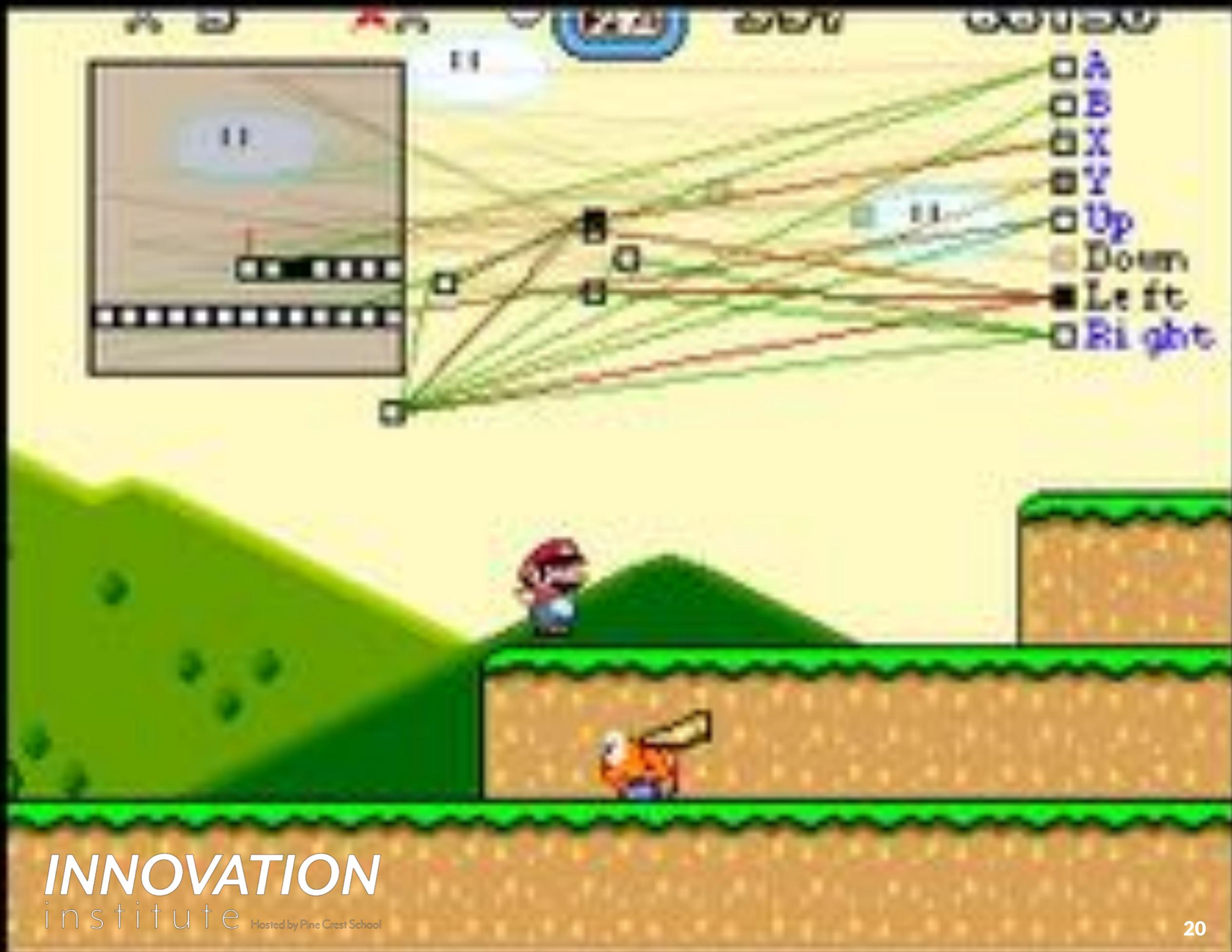
Artificial Intelligence (AI)



Marlboro

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Teaching AI

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Middle School Considerations

1. Students are developing rapidly
2. Cognitive capabilities are sufficient for advanced topics
3. Foundational knowledge may not be established



Our Approach



Web-based Examples

- Quick Draw
- Google CoLab
- Google Image Classification
- TensorFlow Playground



Activities

- Train Google Quick Draw and race the clock
- Smallest Viable Tensor Network
- Make GAN Art
- Write a Chat Bot
- Create an Alexa Skill



Gaming

Middle school students love games.

- Play 20 Questions vs. AI
- DIY Blackjack Opponent
- Make AI that plays Gun, Gun, Shoot

AI Robots

- Vector by Anki (Recommended)
- Cozmo by Anki (Recommended)
- Cue by Wonder Workshop

Resources

- Google Quick Draw
- Tensor Playground
- Google CoLab AI Notebook
- Image Kernels Explained Visually
- GAN Paint
- Cool Applications of GAN



Thank You

GitHub Slides and Resources

Other Resources

Middle School Robots

- Cozmo
- Vector
- Cue



Virtual Reality Tools

- HTC Vive Pro
- Oculus Rift
- Google Expeditions

