Our A.I. Journey—Year 2

What changed in a year,

Why we focused on foundations, and

How we gained more than we ever imagined

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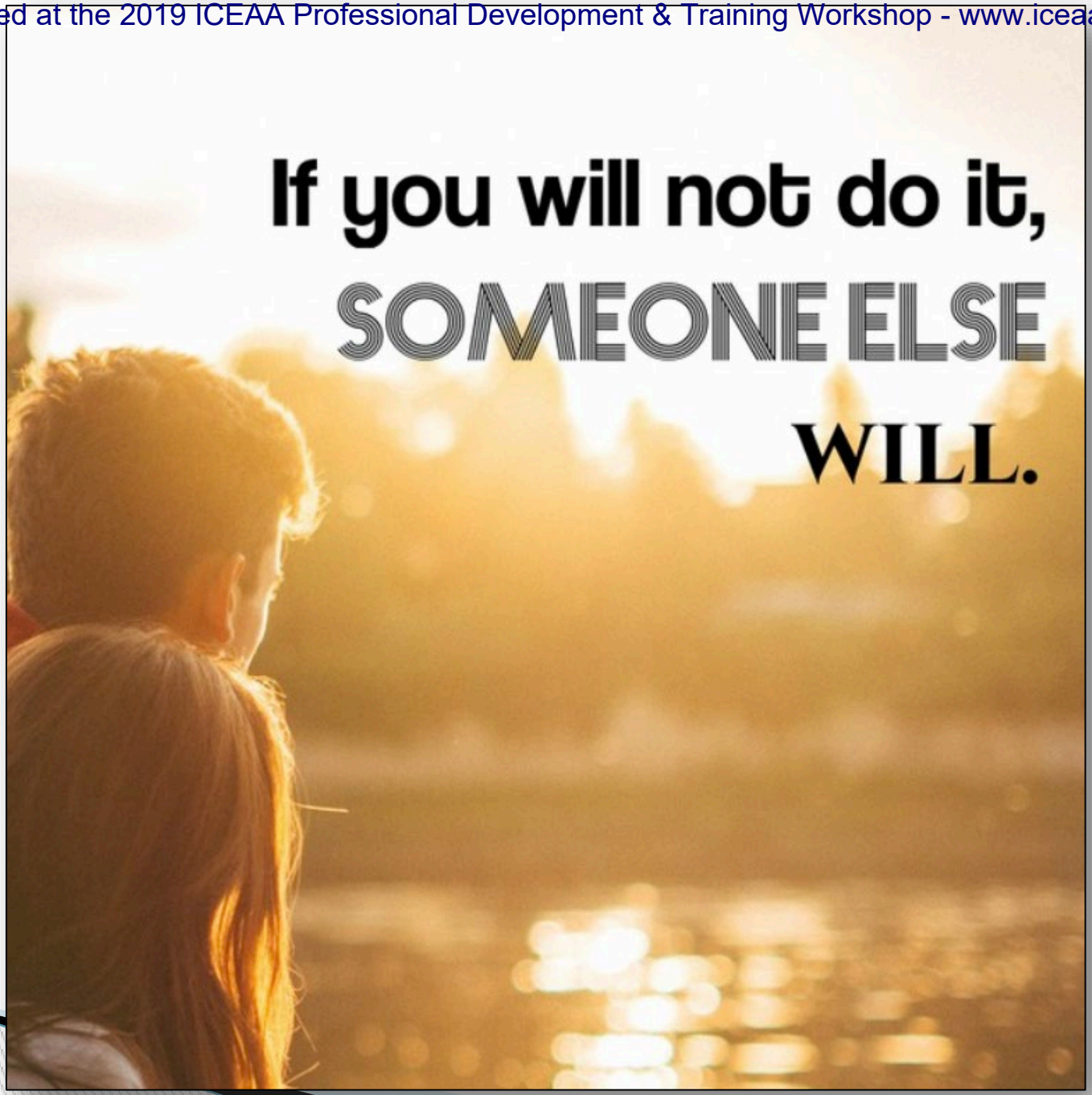
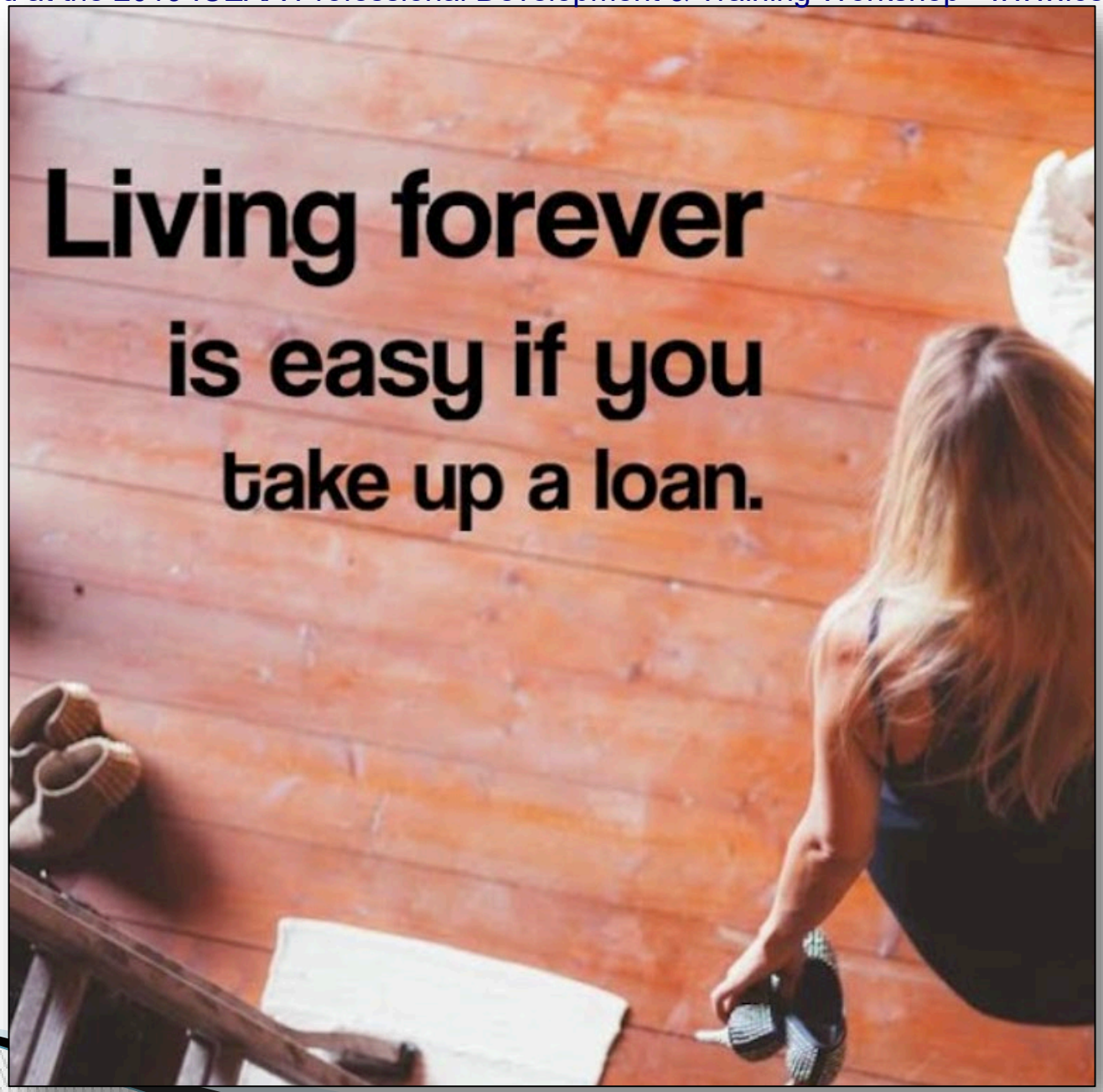
First, some inspiration…


If you will not do it,
SOMEONE ELSE
WILL.


Living forever
is easy if you
take up a loan.

https://inspirobot.me/

Problem to Solve (Year 1, Year 2…)

- Many processes require guessing about the future
- Countless techniques are used to make a plan, try to list all the things that CAN mess up the plan, and to what EXTENT each thing can mess up the plan
- This, it turns, out, is quite difficult to get right
- This (it also turns out) is what trillions of dollars and billions of lives count on

So…no pressure.

Key

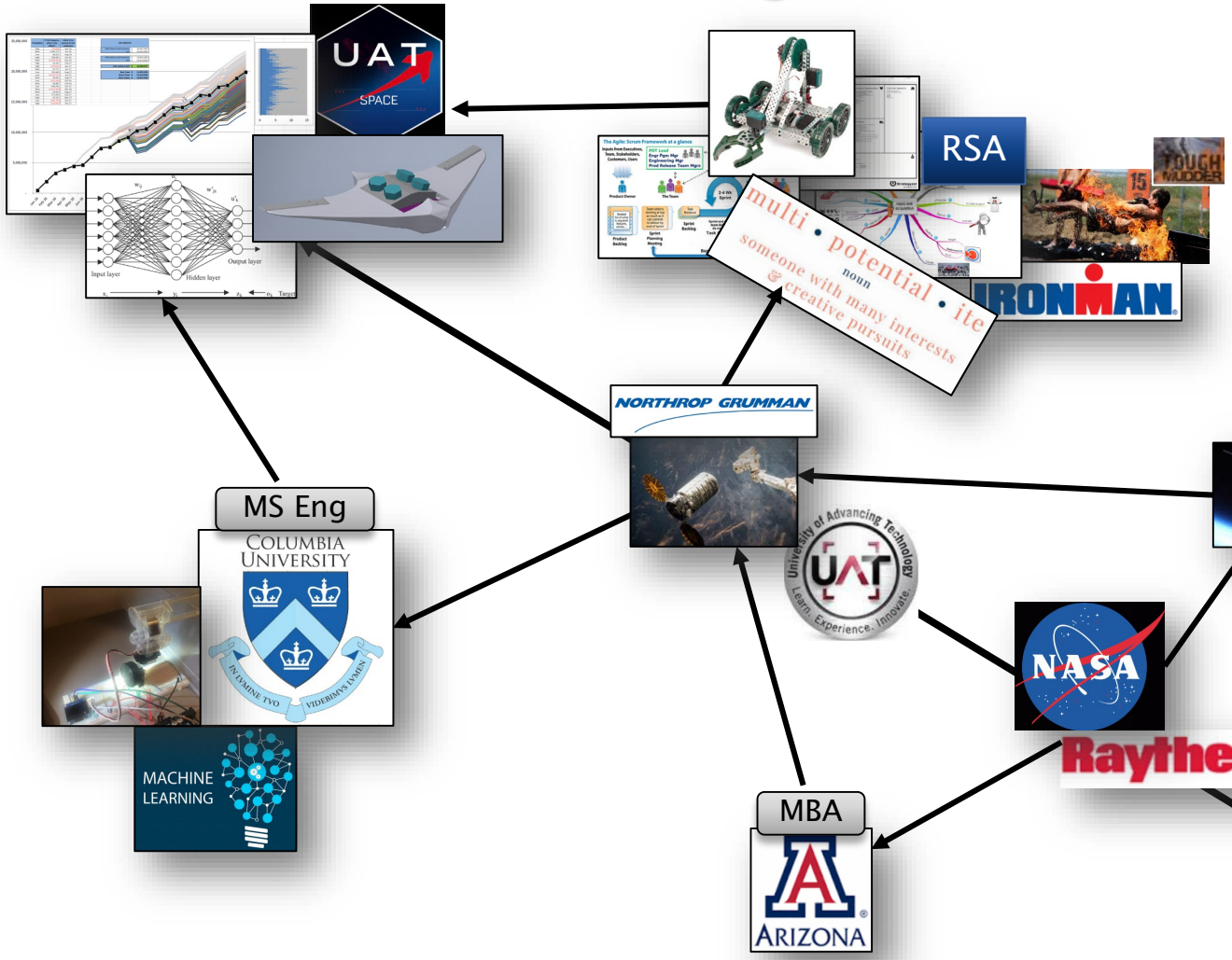
- Terminology
- Relationships
- Progress
- People
- Neural Network Functionality

See 2018 Presentation

2018 Takeaways:

- Machine Learning is improving exponentially; don’t get left behind
- ML/ANN implementation is really hard, but there is ROI at each step if done right
- Don’t let machines take over just yet…

Who Am I (tracking down the root cause)



2019 Reflection: What Happened in Year 1?

- A.I. Learned Some Skills
- Ethics and Regulation
- People have already figured out how to manipulate A.I.
- DARPA has defined A.I. in three phases
- Pros/Cons
- What do we take from this?
- Don’t let the machines take over just yet…
- Aim high…start small.

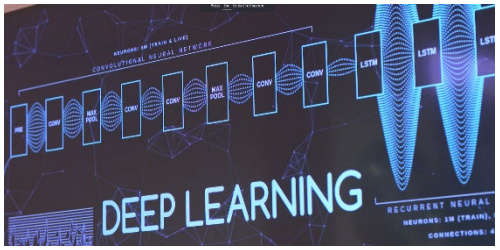
A.I. Learned Some Skills

5 Things that A.I. is Better at than You

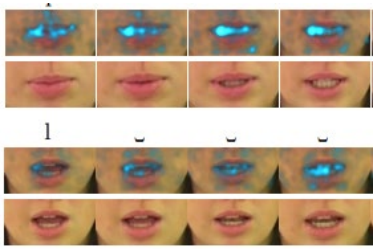
- Predicting Heart Attacks

- Playing Poker

- Detecting Musical Genres



- Reading Lips



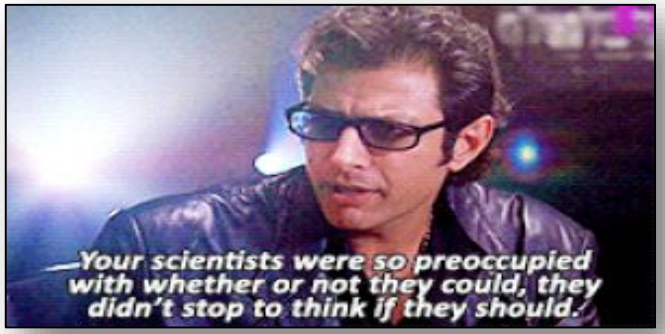
- Identifying Tattoos

A.I. has been busy…

Ethics and Regulation

- How do we control the ethical treatment of data?

(GDPR) — a far-reaching European Union law that tells companies what types of data they can and can't store about European citizens, what they must disclose to those citizens about that data storage, and how they must dispose of the data.

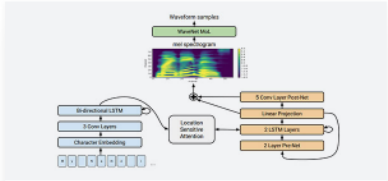


Great Plans can be Disrupted…

Google AI

The US Department of Defense's drones include the MQ-1B Predator unmanned aerial vehicle (UAV), used to launch airstrikes, carry out reconnaissance and transport cargo

Credit **John Moore/Getty Images**



Tacotron 2: Generating Human-like Speech from Text

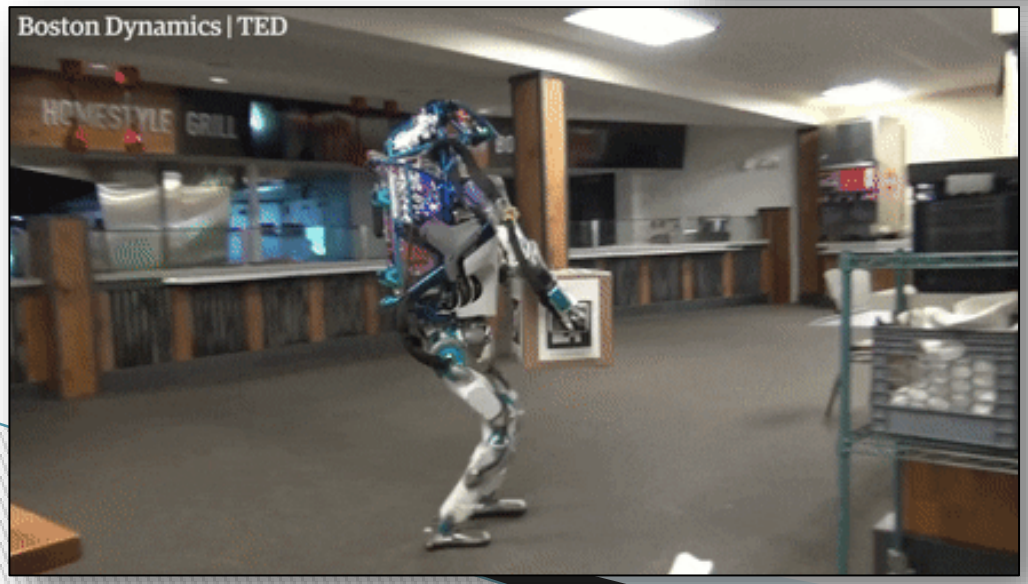
We generate human-like speech from text using neural networks trained using only speech examples and corresponding text transcripts.

Open Sourcing the Hunt for Exoplanets

We're excited to release the TensorFlow model for processing Kepler Space Telescope data, training our neural network, and making predictions about new exoplanet candidate signals.

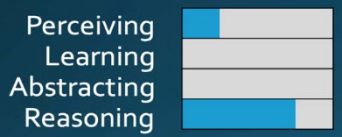
Great Plans can be Disrupted…

amazon



DARPA has defined A.I. in three phases

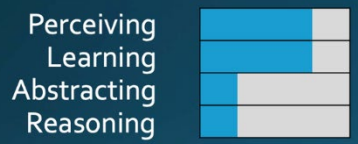
The first wave of AI



Enables reasoning over narrowly defined problems

No learning capability and poor handling of uncertainty

The second wave of AI



Nuanced classification and prediction capabilities

No contextual capability and minimal reasoning ability

The (future) third wave of AI

Contextual adaptation

Systems construct contextual explanatory models for classes of real world phenomena

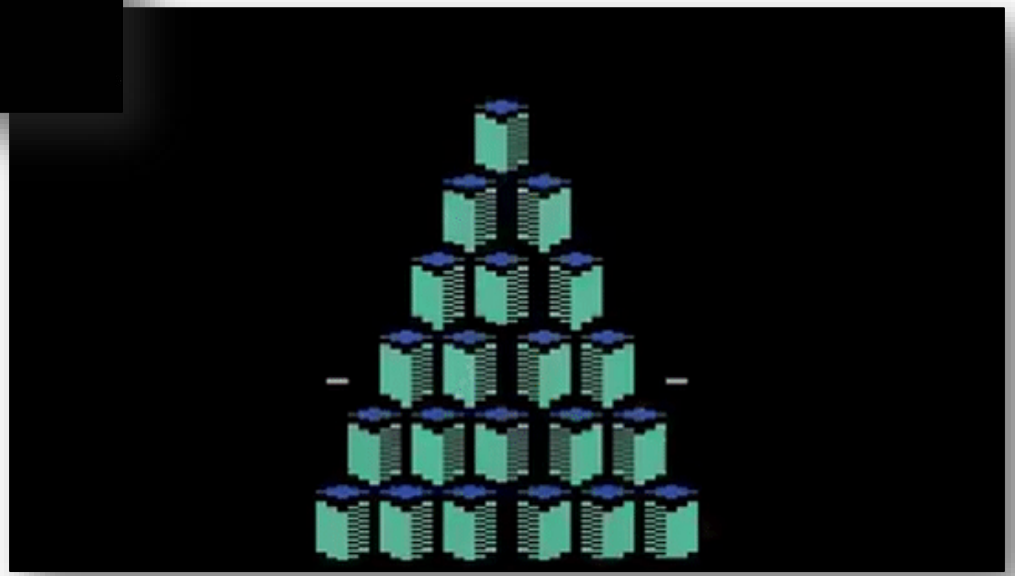
Pros of A.I…

TL;DR

A video game-playing AI beat Q*bert in a way no one's ever seen before

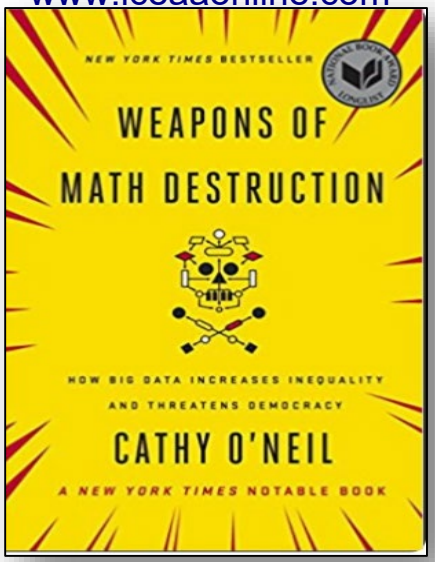
This is what happens when you leave AI agents alone

By James Vincent | Feb 28, 2018, 1:00pm EST



So…no pressure.

Cons of A.I…



There are three qualities that turn a regular run-of-the-mill algorithm into a WMD, according to O'Neil. First, they're widespread. "They're making important decisions about a lot of people. Getting a job, getting a credit card, getting insurance, going to college, going to prison."

Second, they're secret. "People don't understand how they're being scored," O'Neil said. "They can't appeal. They often don't even understand that they're being scored."

Lastly, they're unfair to the induvial. They impact "hundreds thousands of individuals [who are] unfairly being denied something they deserve by a secret algorithm that they can't understand and cannot appeal."

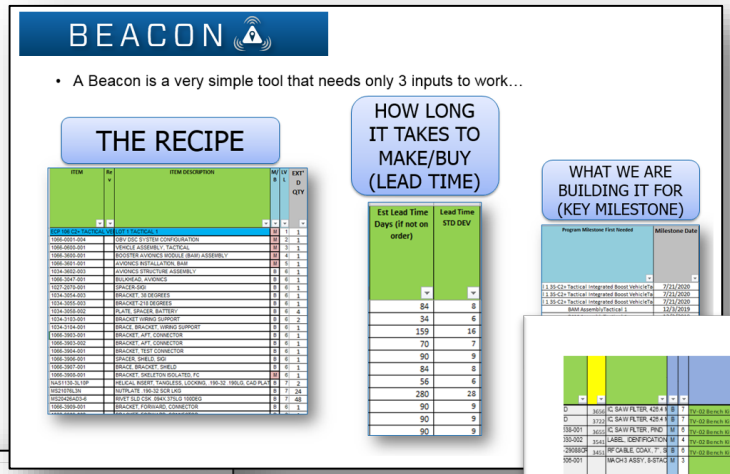
O'Neil related a story about a teacher accountability test that was brought to her attention by a friend, who is a principal of a Brooklyn high school. "She said her teachers were at risk of not getting tenure based on a secret scoring algorithm that she couldn't understand," O'Neil said. "I said, show me the formula I'll explain it to you. I'm a mathematician. She said, we'll I asked for the formula and they told me it was math and I wouldn't understand it.

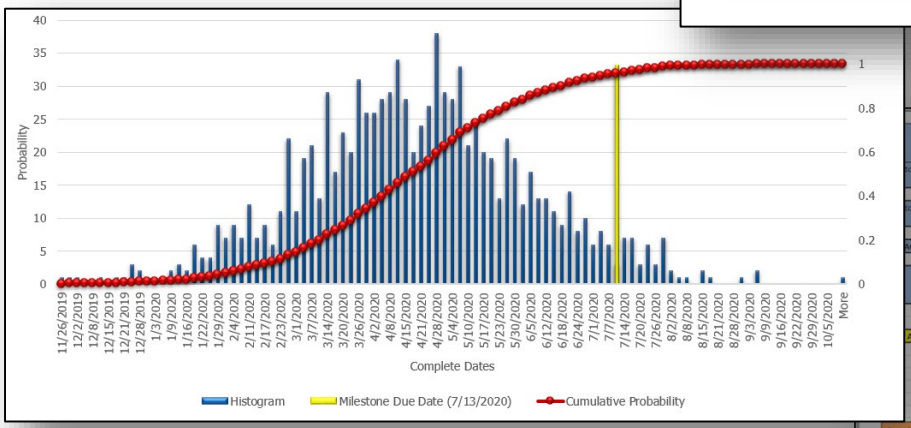
So…no pressure.

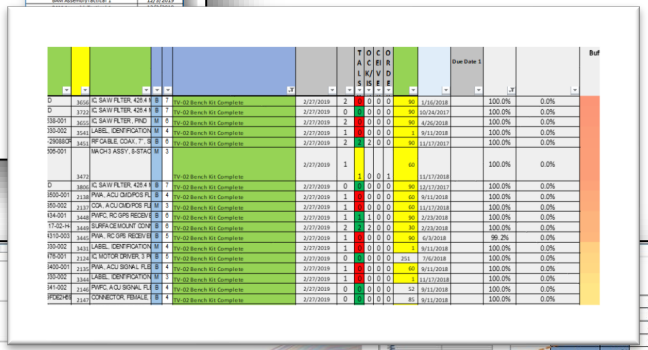
Don't let the machines take over just yet…

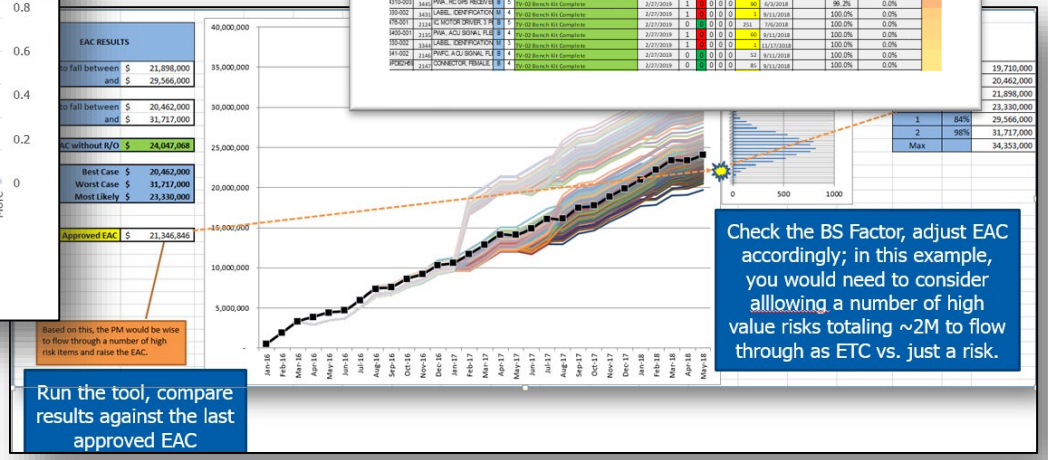
Aim high…start small.

- Research Benchmark
- Pick One Problem
- Get Your Data into Shape
- Clean it up
- No Bias









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THANK YOU!

Questions?

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Resources to Learn More

- https://www.datanami.com/2018/12/13/2018-a-big-data-year-in-review/
- https://www.datanami.com/2018/01/24/techs-hottest-new-trend-data-governance/
- https://www.datanami.com/2018/07/06/ai-youve-got-some-explaining-to-do/
- https://www.datanami.com/2017/06/08/5-things-ai-better/
- https://www.datanami.com/2017/10/06/controls-algorithmic-future/
- https://www.theverge.com/2018/2/28/17063780/google-ai-machine-learning-hub-crash-course-free
- https://machinelearningmastery.com/regression-tutorial-keras-deep-learning-library-python/
- http://www.businessinsider.com/computer-program-taught-itself-walk-run-play-soccer-2017-8
- https://www.reddit.com/r/videos/comments/6mw6u1/googles_deepmind_ai_just_taught_itself_to_walk/
- https://www.kdnuggets.com/2016/01/seven-steps-deep-learning.html
- https://www.toptal.com/machine-learning/an-introduction-to-deep-learning-from-perceptrons-to-deep-networks
- https://www.mathworks.com/discovery/deep-learning.html
- https://www.kdnuggets.com/2015/11/seven-steps-machine-learning-python.html
- https://www.youtube.com/watch?v=b99UVkWzYTQ
- http://www.iro.umontreal.ca/~bengioy/talks/DL-Tutorial-NIPS2015.pdf
- http://neuralnetworksanddeeplearning.com/chap1.html
- https://www.youtube.com/watch?v=962lLfW-8Jo
- https://www.youtube.com/playlist?list=PLnnr1O8OWc6boN4WHeuisJWmeQHH9D_Vg
- http://cs.stanford.edu/~quocle/tutorial1.pdf\
- https://jeremykun.com/2012/12/09/neural-networks-and-backpropagation/
- https://www.popularmechanics.com/science/health/a20967153/skin-cancer-artificial-intelligence-better-than-dermatologists/

Don’t forget me as a resource as well!