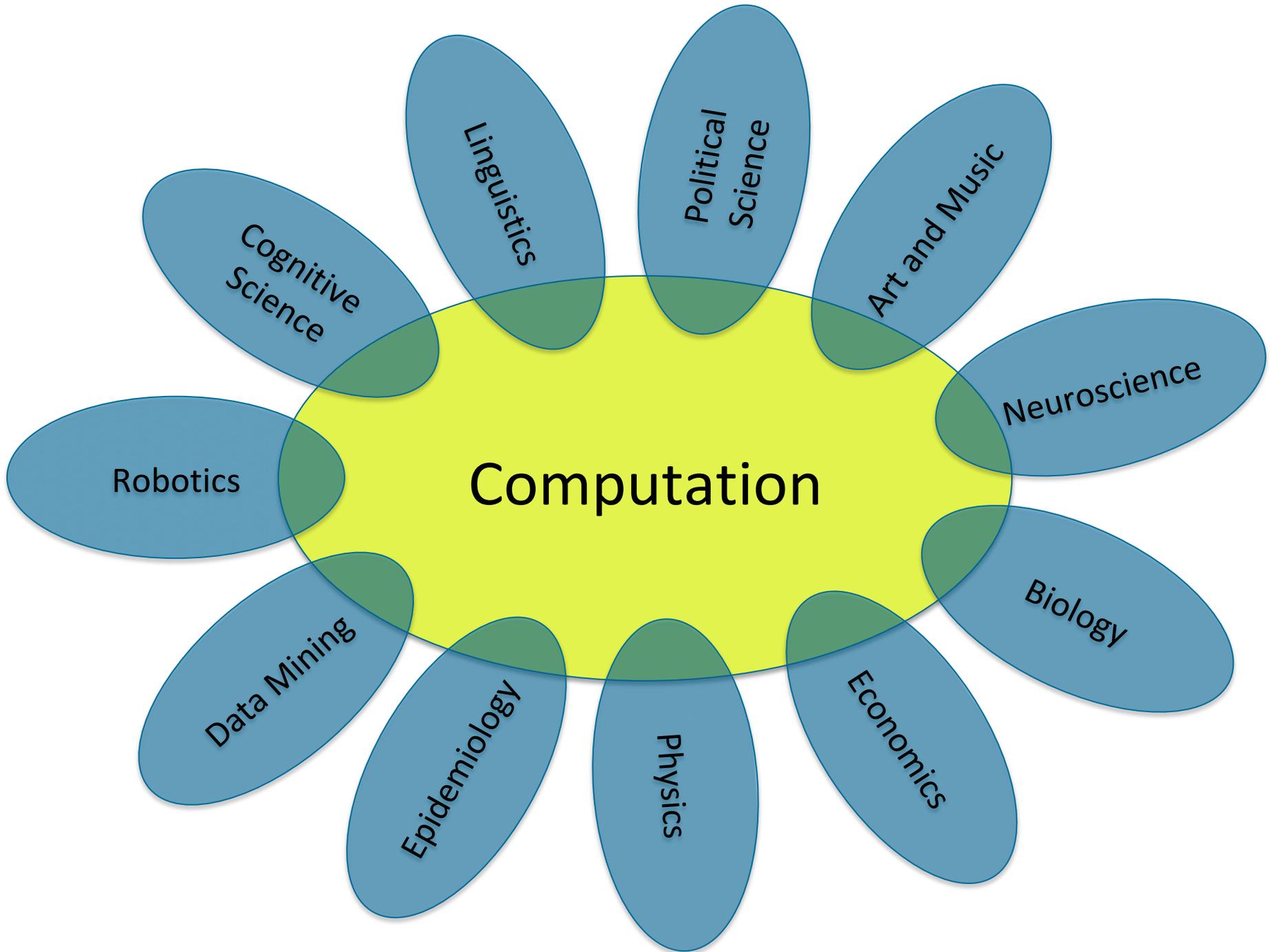


Computing as an Interdisciplinary Toolkit

Day 1



Computation

Linguistics

Political Science

Art and Music

Neuroscience

Biology

Economics

Physics

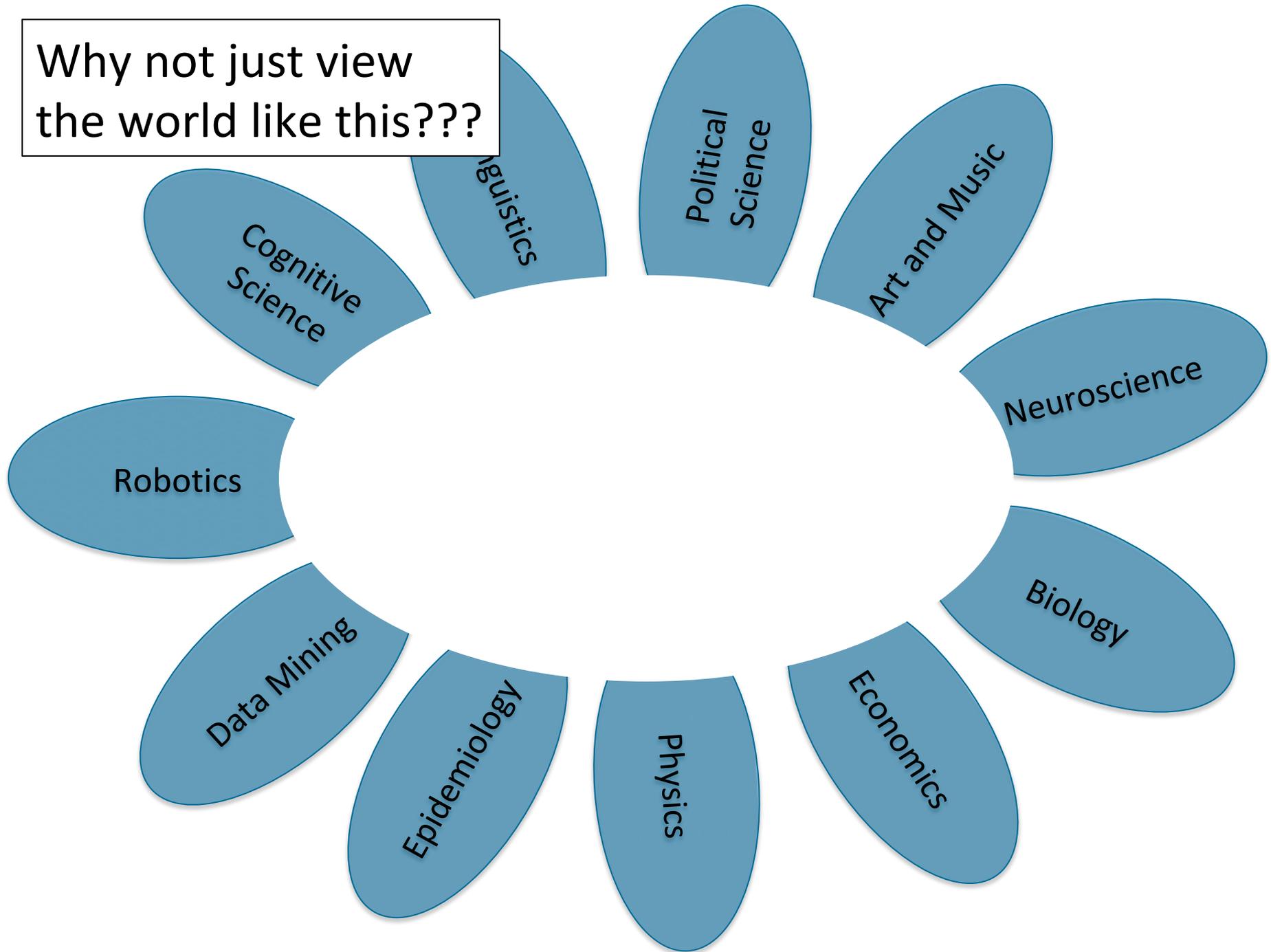
Epidemiology

Data Mining

Robotics

Cognitive Science

Why not just view
the world like this???



What Makes Computing Such a Potent Skill? Or, **How this Class Will Give You Superpowers**¹.

If you know how to use professional software engineering tools and processes, you can:

- Combine multiple existing software packages to do something awesome
- Build your own tool from scratch to solve problems (or help some people) that are important to you

¹ The SoftDes faculty assume no liability if this class does not actually give you superpowers

What Makes Computing Such a Potent Skill? Or, **How this Class Will Give You Superpowers**¹.

If you know how to frame a problem computationally, you can:

- Develop creative solutions to hard problems
- See connections between your problem and other problems that initially seemed unrelated

¹ The SoftDes faculty assume no liability if this class does not actually give you superpowers

What Makes Computing Such a Potent Skill? Or, **How this Class Will Give You Superpowers**¹.

If you know how to effectively communicate and understand computational ideas, you can:

- Maximize the impact of code you write
- Work effectively (speak the same language) as software developers that you might collaborate with or hire

¹ The SoftDes faculty assume no liability if this class does not actually give you superpowers

Anecdotes from Recent Faculty Search

- Computation in Astronomy
- Computation in Healthcare
- Computation in Social Justice
- ...

Computer Graphics



Political Science

We're forecasting the election with three models

Polls-plus forecast
What polls, the economy and historical data tell us about Nov. 8

Polls-only forecast
What polls alone tell us about Nov. 8

Now-cast
Who would win the election if it were held today

National overview

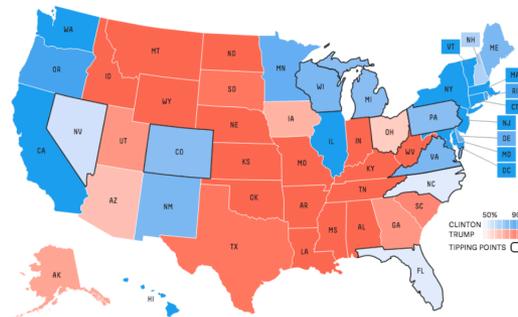
Updates +
National polls +

States to watch

- Arizona
- Colorado
- Florida +
- Georgia +
- Iowa +
- Maine
- Michigan +
- Minnesota
- Nevada +
- New Hampshire +
- New Mexico
- North Carolina +
- Ohio +
- Pennsylvania +
- Utah +
- Virginia +
- Wisconsin

Who will win the presidency?

Chance of winning



Electoral votes

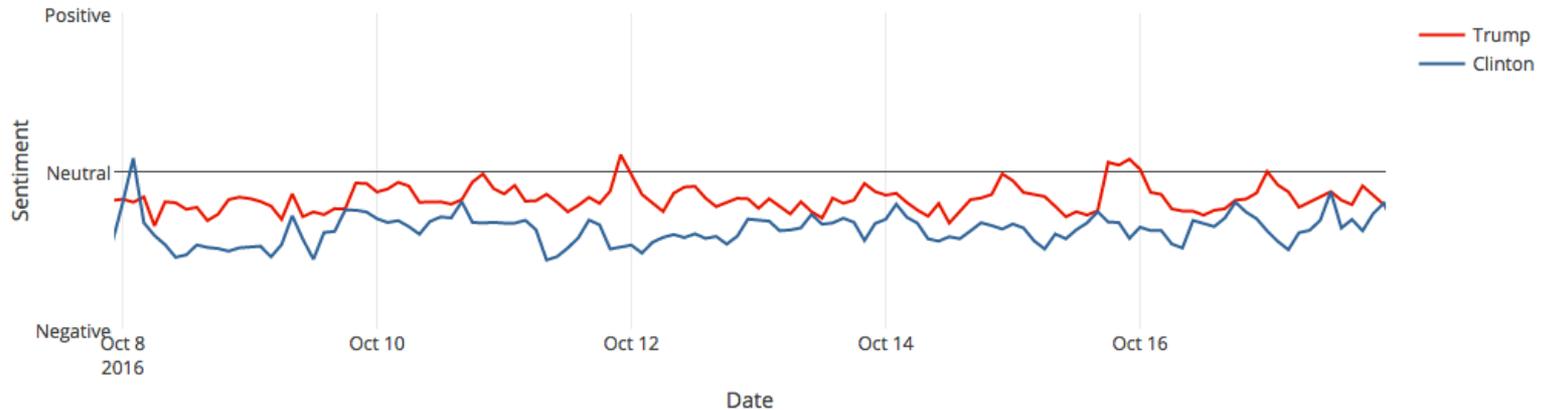
Popular vote

How Popular Is Donald Trump?

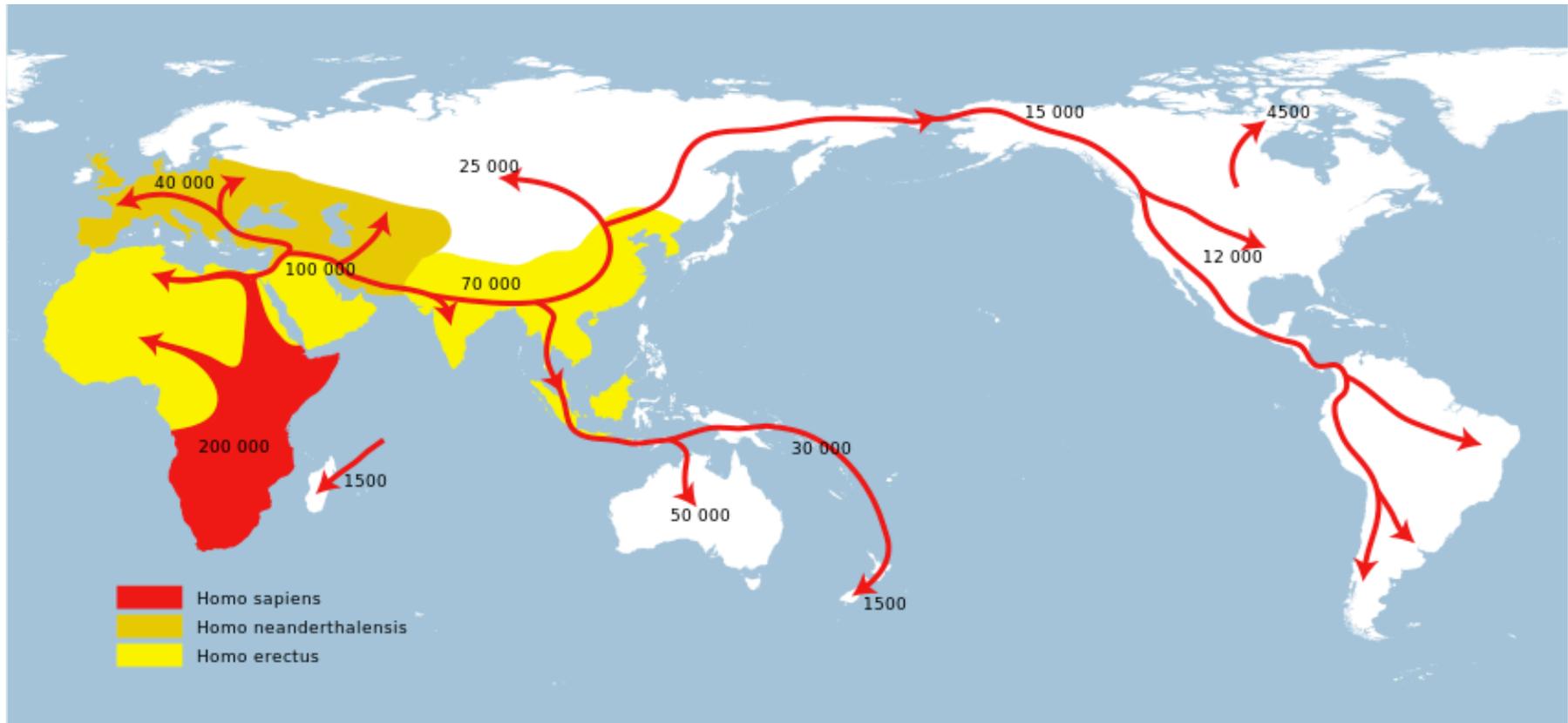
UPDATED 6 HOURS AGO



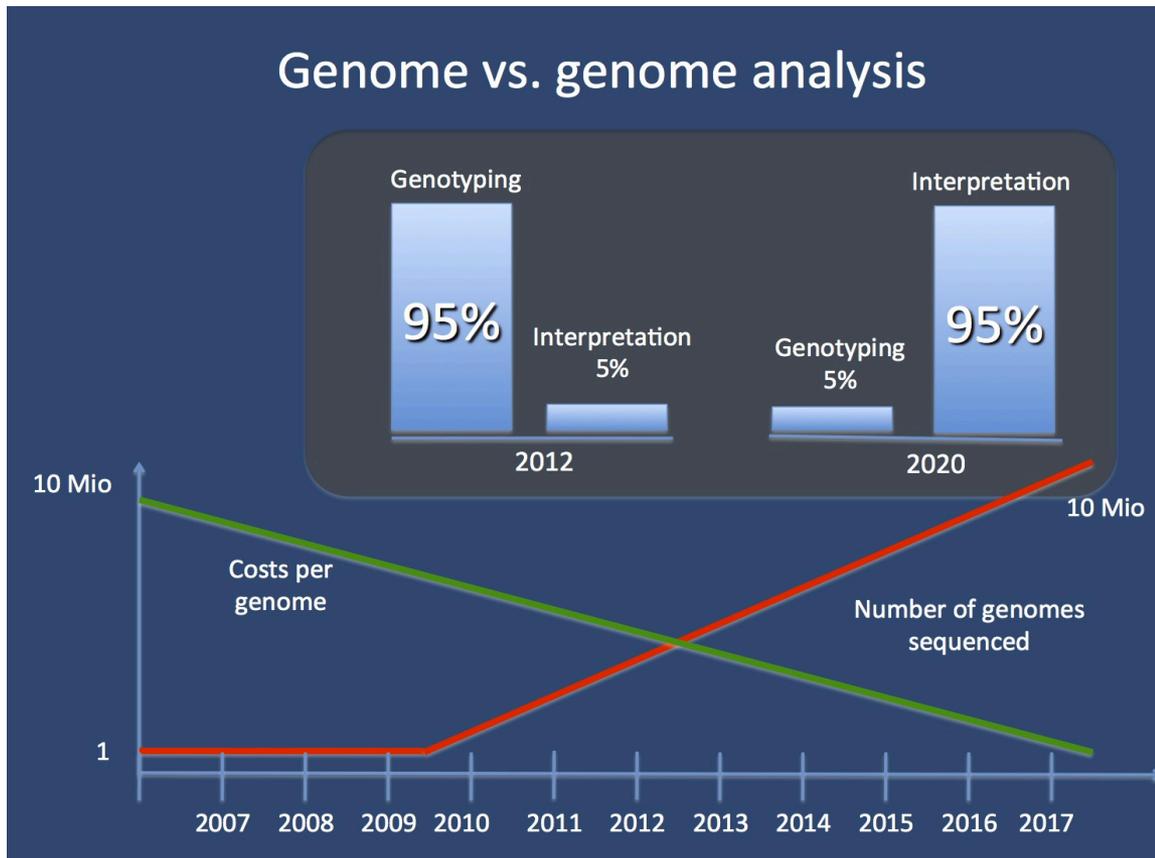
Candidate sentiment over time



Computational Biology: Origin of Modern Humans



Bioinformatics

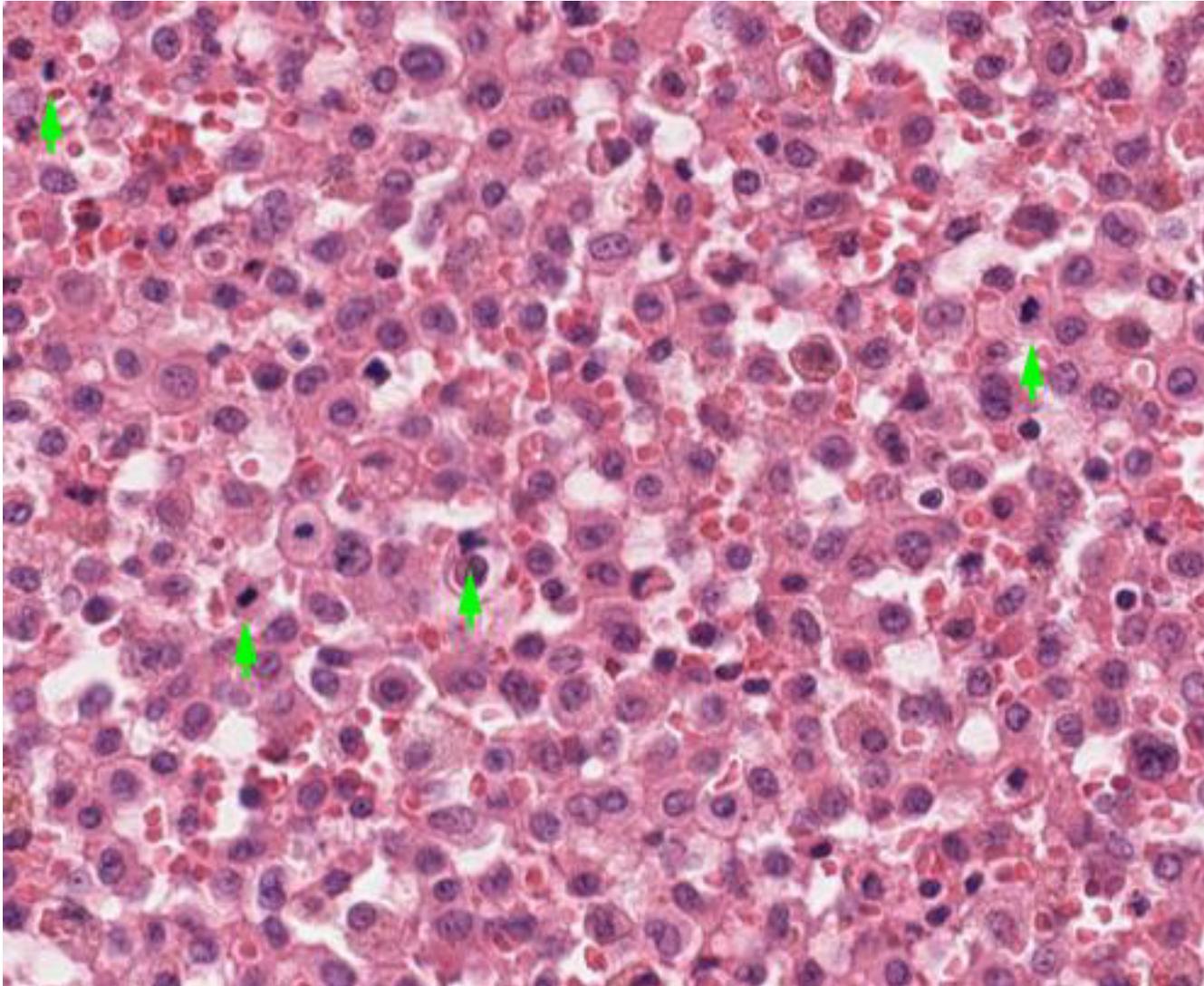


Has the potential to lead to better screening and understanding of complex syndromes and diseases.

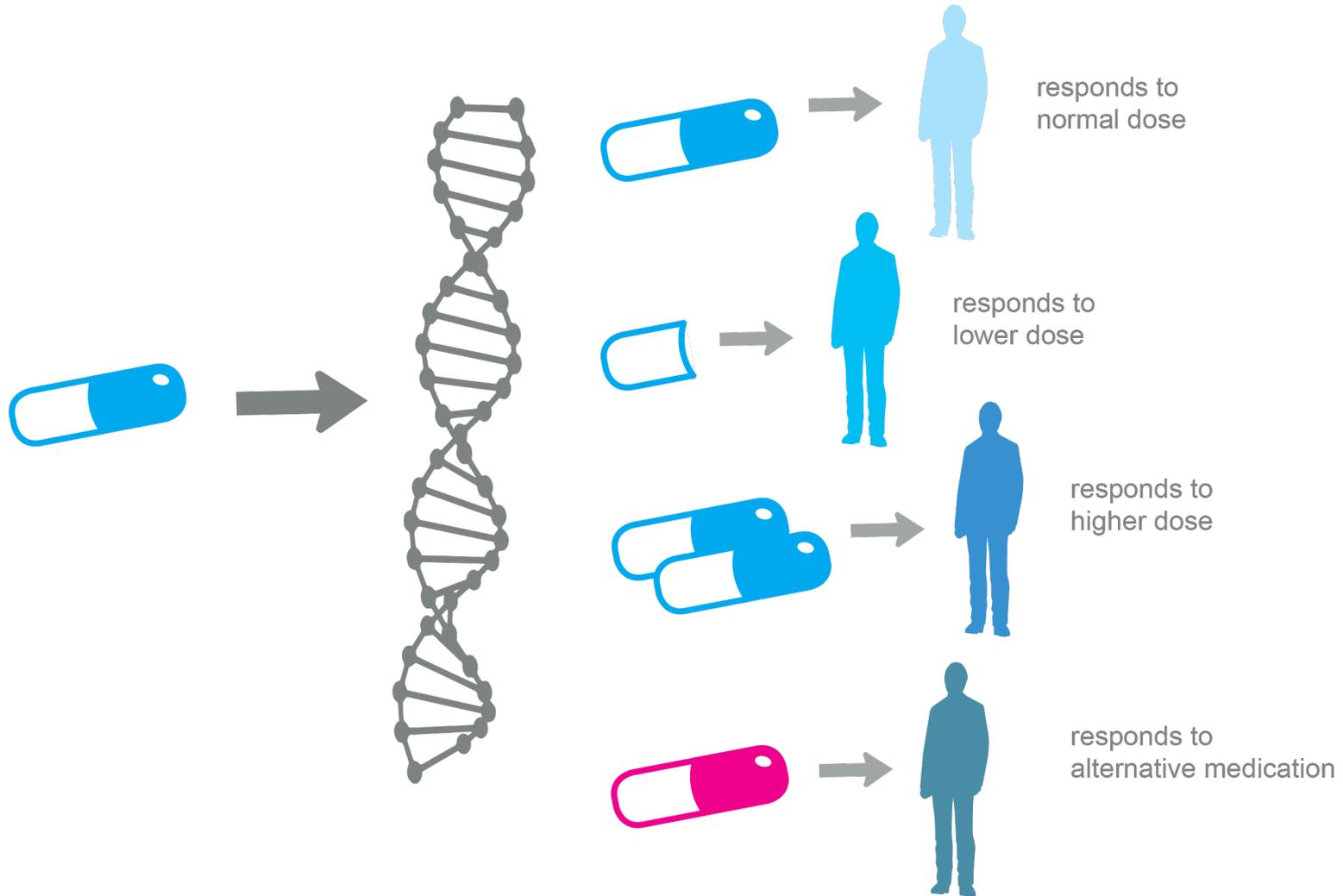
Medical Imaging

- Automated lesion detection
- Computer aided diagnosis of CAT scans of the lung
- Etc.
- <http://ieeexplore.ieee.org/document/7463094/#full-text-section>

Medical Imaging: Histology



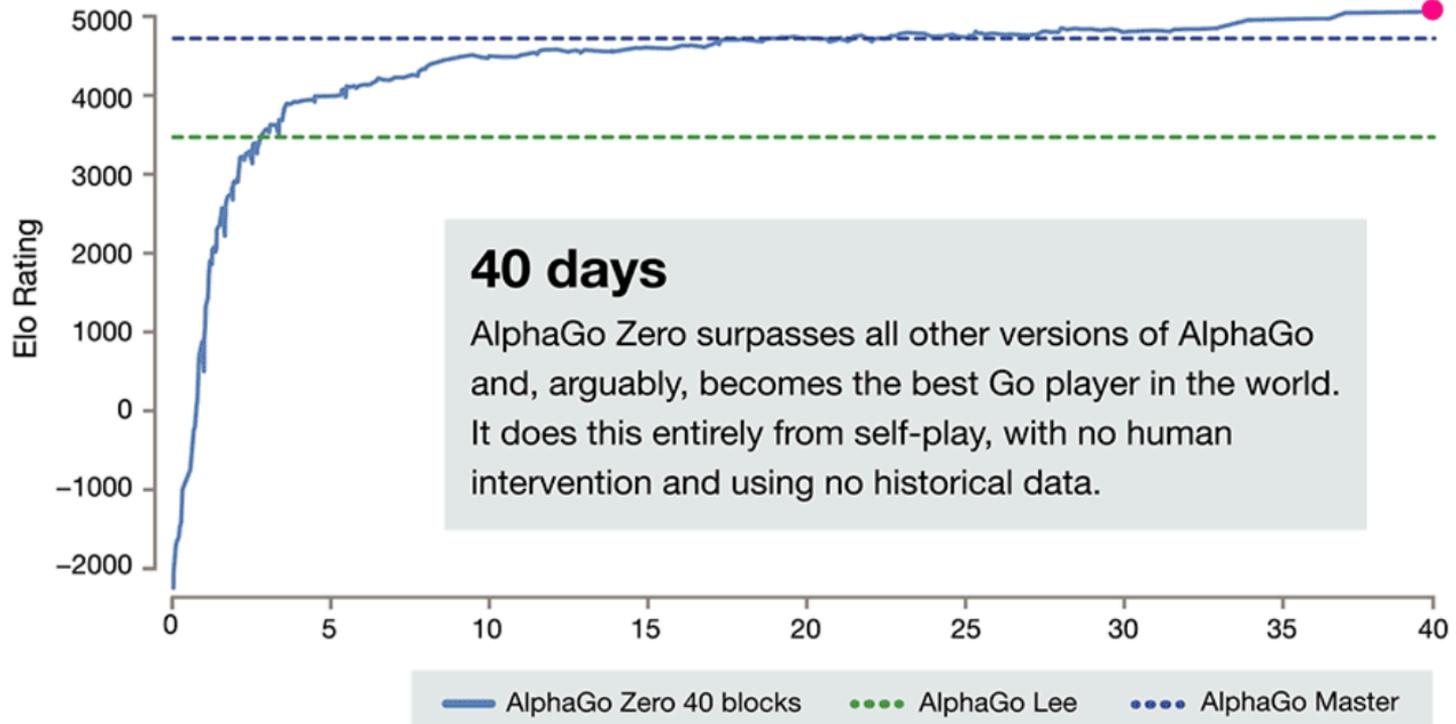
Personalized Medicine



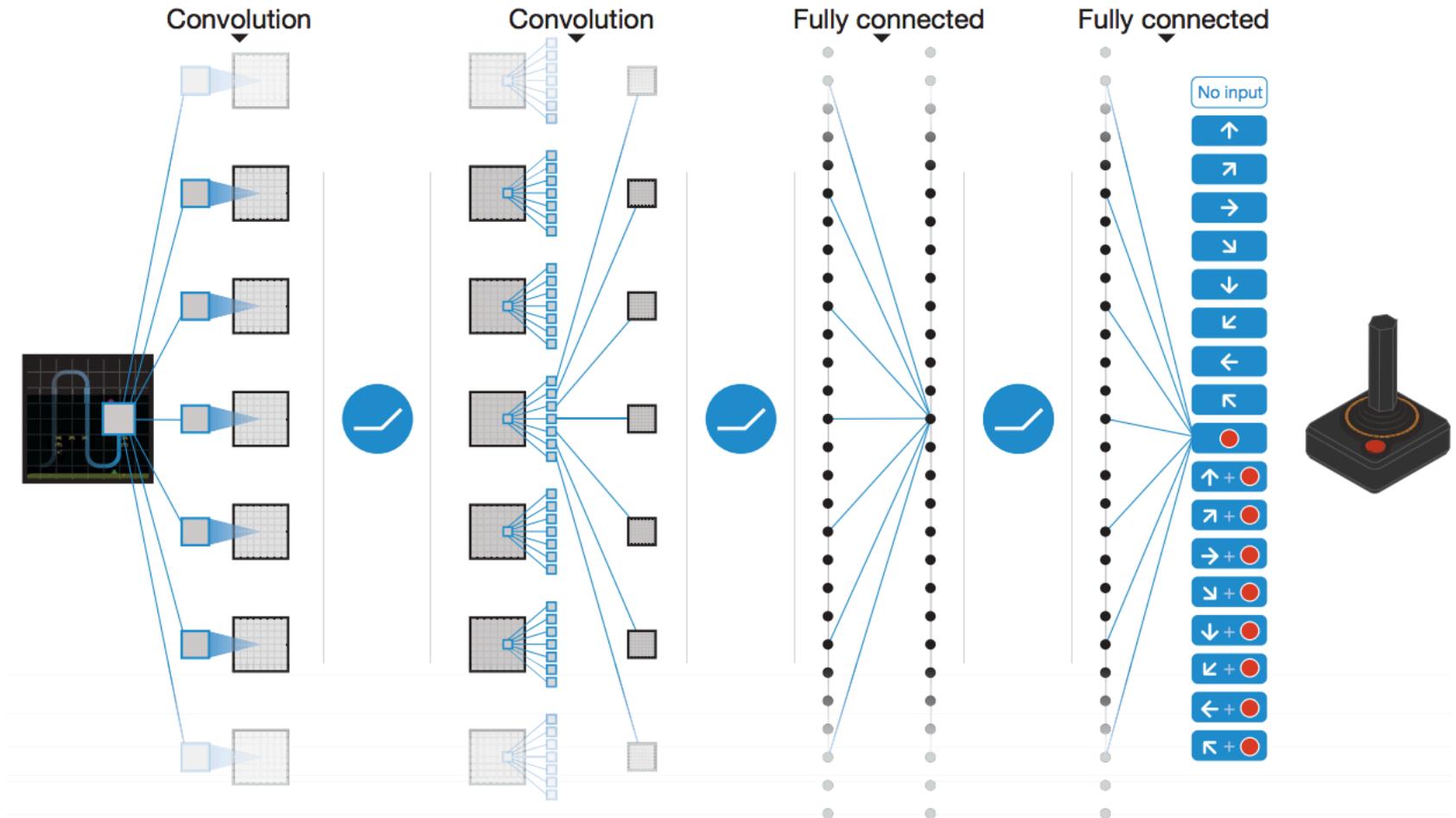
AI / Machine Learning



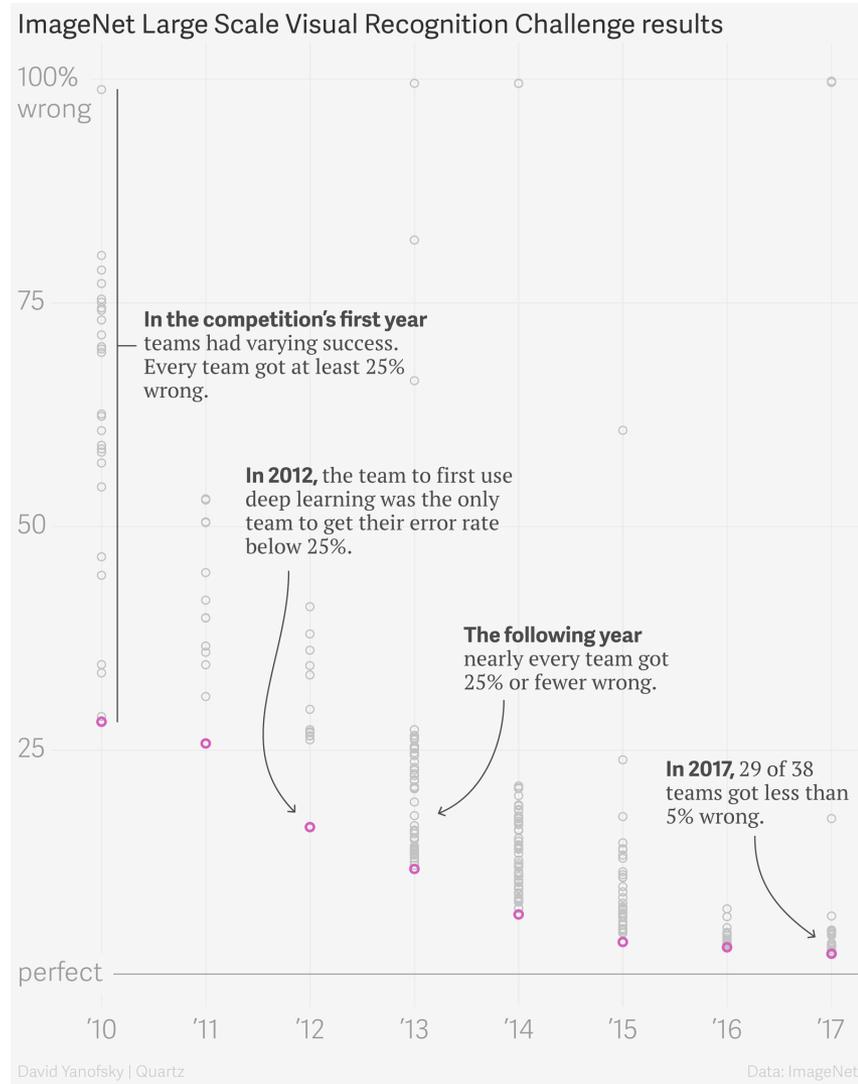
AI / Machine Learning



AI / Machine Learning



AI / Machine Learning



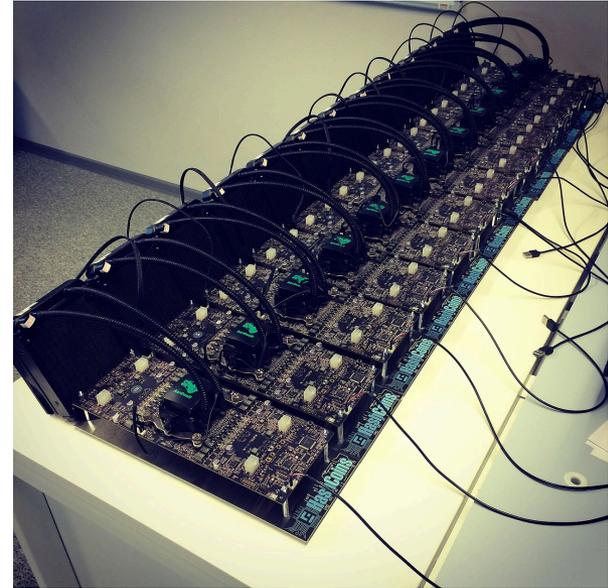
Wearable Sensing



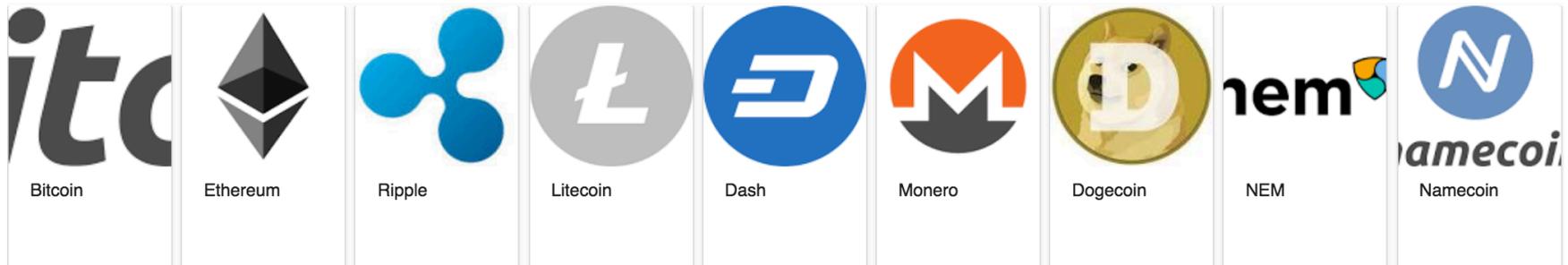
Robotics: DARPA Robotics Challenge



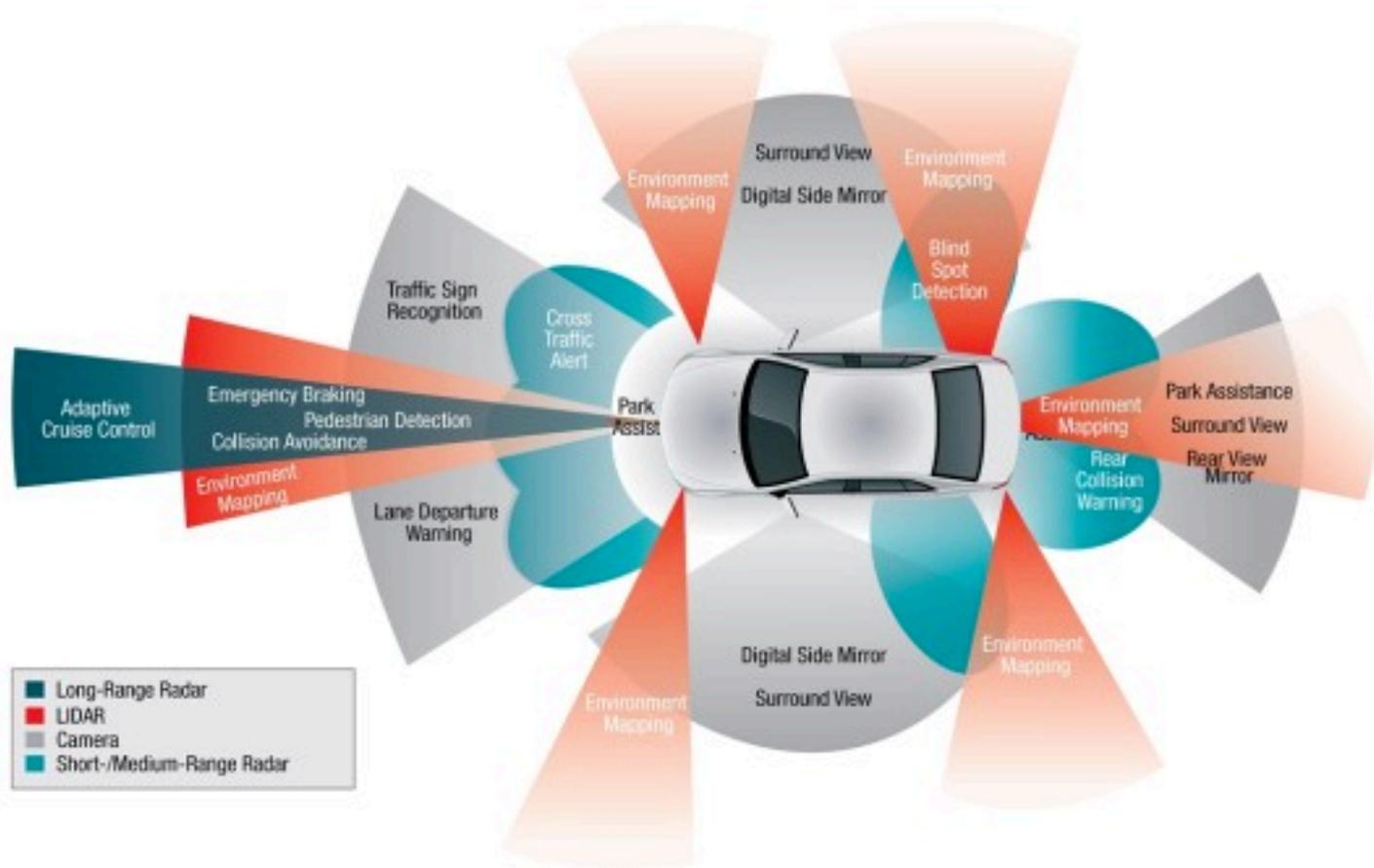
Crypto Currencies



BitCoin mining hardware



Robotics: Self-driving Cars



ART and Music



Protobytes
By Ira Greenberg

For Your Processing

<http://fyprocessing.tumblr.com/>

ART and Music

“The Triumph of the Cyborg Composer”

<http://www.psmag.com/mustread/triumph-of-the-cyborg-composer-8507/>

Excerpts from Light and Darkness
By Emily Howell