

+ 1 LEVEL UP

CODESTOCK

2018



Paige Bailey

Sr. Cloud Developer Advocate



Work Experience

- Focus at Microsoft is *machine learning* and *artificial intelligence*.
- Prior to joining Microsoft, was a *data scientist* and *geophysical application developer* in the energy industry for 5 years.
- *GIS Technician* (Esri products) for two years.

Toolkit

- Python (*10 years*)
- R (*4 years*)
- Spark, Kafka, Hive, HBase (*2 years*)

Location: Bellevue, WA

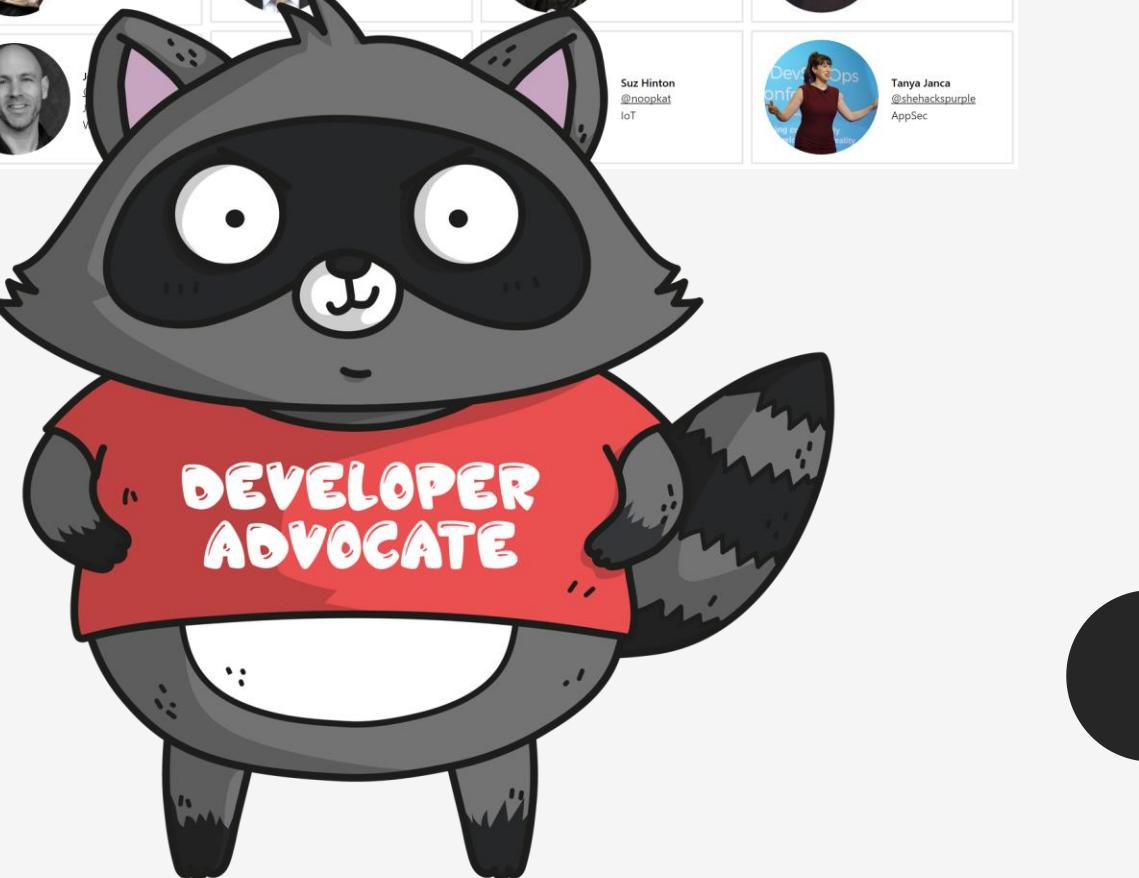
Twitter: @DynamicWebPaige



 Aaron Wislang @as_w Linux	 Abel Wang @AbelSquidHead DevOps	 Alena Hall @lenandroid High Scale / Big Data	 Bryan Liston @listonb Linux	 Burke Holland @burkeholland JavaScript / Node.js	 Cecil Phillip @cecilphillip .NET	 Jonathan Giles @jonathanGiles Java	 Laurent Bugnion @LBugnion .NET / Xamarin	 Matthew Soucoup @codemillmatt .NET / Xamarin
 Anthony Chu .NET	 Ashley McNamara @ashleymcnamara Linux	 Asim Hussain @jawahe JavaScript / Node.js / Python	 Christina Warren @film_girl HTML	 Damian Brady @damovisa DevOps	 David Smith @revdavid AI / Data Science / R	 Maxime Rouiller @maximrouiller .NET	 Paige Bailey @DynamicWebPaige Data / AI / ML	 Prashant Sridharan @CoolAssPuppy Chief Herder
 Bernd Verst @BerndVerst Linux / Containers / Python	 Brandon Minnick @BrandonXamarin Xamarin	 Brian Benz @bbenz Java	 Donovan Brown @DonovanBrown DevOps	 Erik St. Martin @enikstmartin Linux	 Jasmine Greenaway @paladique .NET	 Ruth Yakubu @ruthiyakubu Data / AI	 Sarah Drasner @sarah_edo JavaScript / Node.js / Python	 Scott Cate @ScottCate .NET
 Brian Clark @clarkio JavaScript / Node.js / Python	 Brian Holt @holbt JavaScript / Node.js	 Brian Ketelsen @bketelsen Linux	 Jeff Sandquist @jeffsand Change invigorates the soul	 Jeremy Likness @jeremyLikness .NET	 Jessica Deen @jdeen Linux / Open Source	 Seth Juarez @sethjuarez AI / ML / Quantum / Emerging	 Shayne Boyer @spboyer .NET	 Simona Cotin @simona_cotin JavaScript / Node.js / Python
 Brian Peek @BrianPeek Gaming	 Bridget Kromhout @bridgetkromhout Linux	 Bruno Borges @brunoborges Java	 Jessica Frazelle @jessfraz Linux / Open Source	 Jim Bennett @jimbobbenett Xamarin	 Suz Hinton @noopkat IoT	 Tanya Janca @shehackspurple AppSec		
 Tim Heuer @timheuer .NET / Xamarin	 Vadim Karpusenko @vadi HPC / AI / ML / DL	 Zachary Deptawa @zdeptawa Linux						



Azure



<https://developer.microsoft.com/en-us/advocates/>



@DynamicWebPaige



CodeStock was actually my very first conference talk!

@sethjuarez

Seth Juarez • 2h



CodeStock changed my life. It was both the first technical conference I attended and the first I spoke at. I've been going every year except this one. It's at CodeStock I need Michael Crump who gave me a ton of advice about coming over to Microsoft. I have many friends I made there who continue to be close to this day.

@jeremylikness

Jeremy Likness ⚡ • 6m

i was going to codestock with our friend Jim, and i was very, very frustrated at the time. I told Jim that unless something crazy inspiring happened soon, i was getting out of development that year.

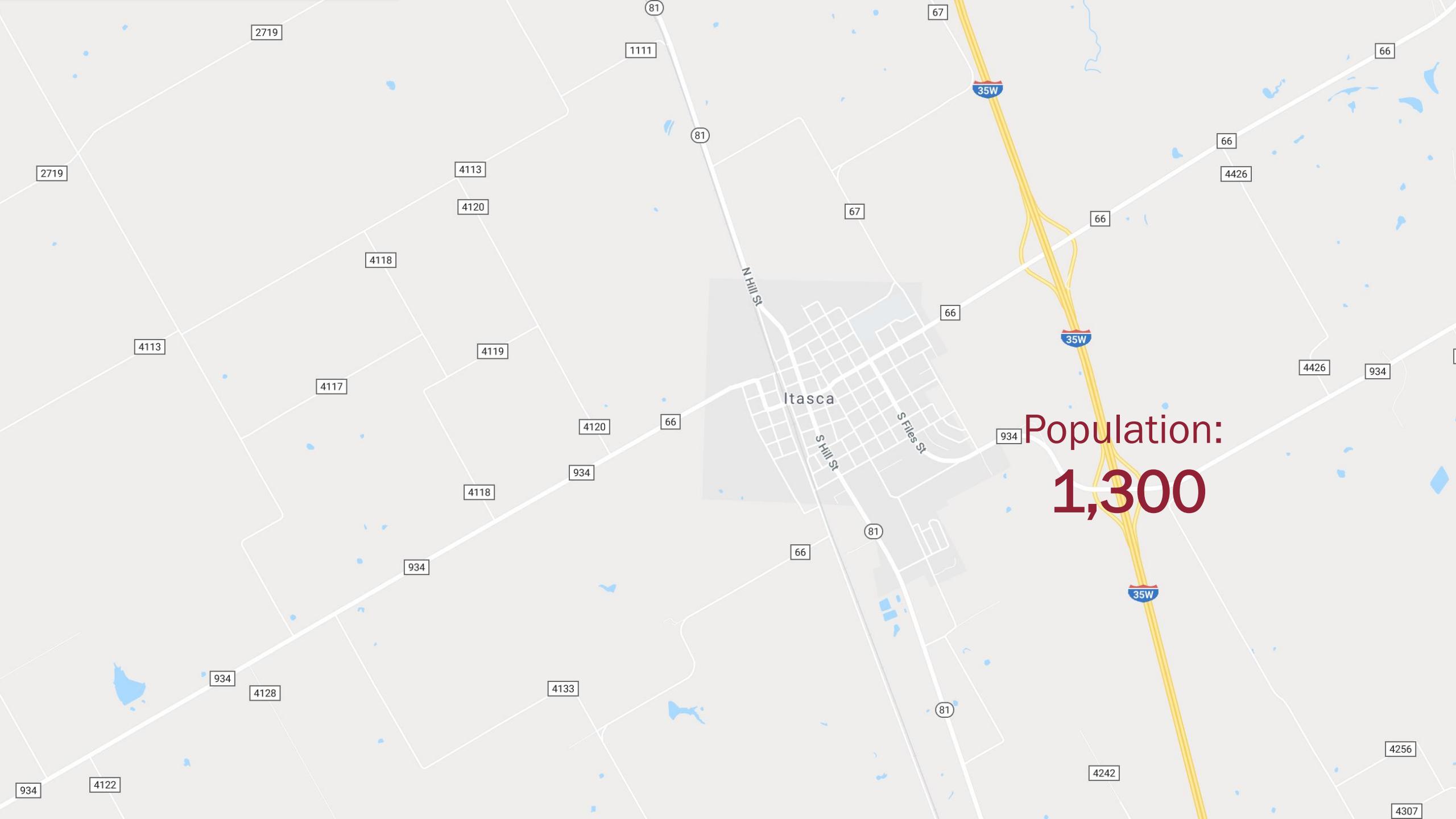
at codestock, i went to Seth's session on Kinect development and was immediately inspired, remembered why i was in dev. then i went to Jamie's Ruby for .NET Devs talk and was hooked again.

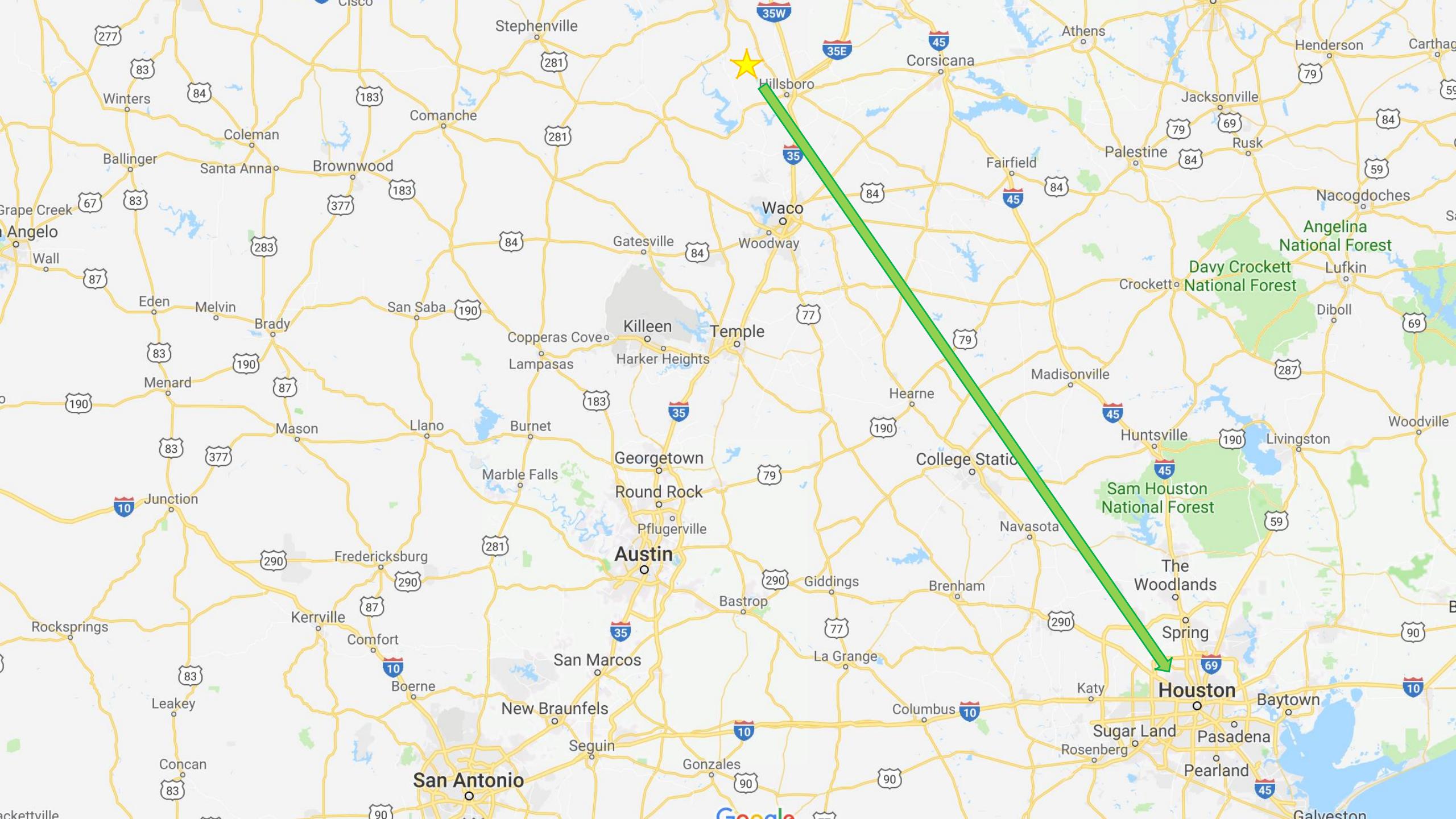


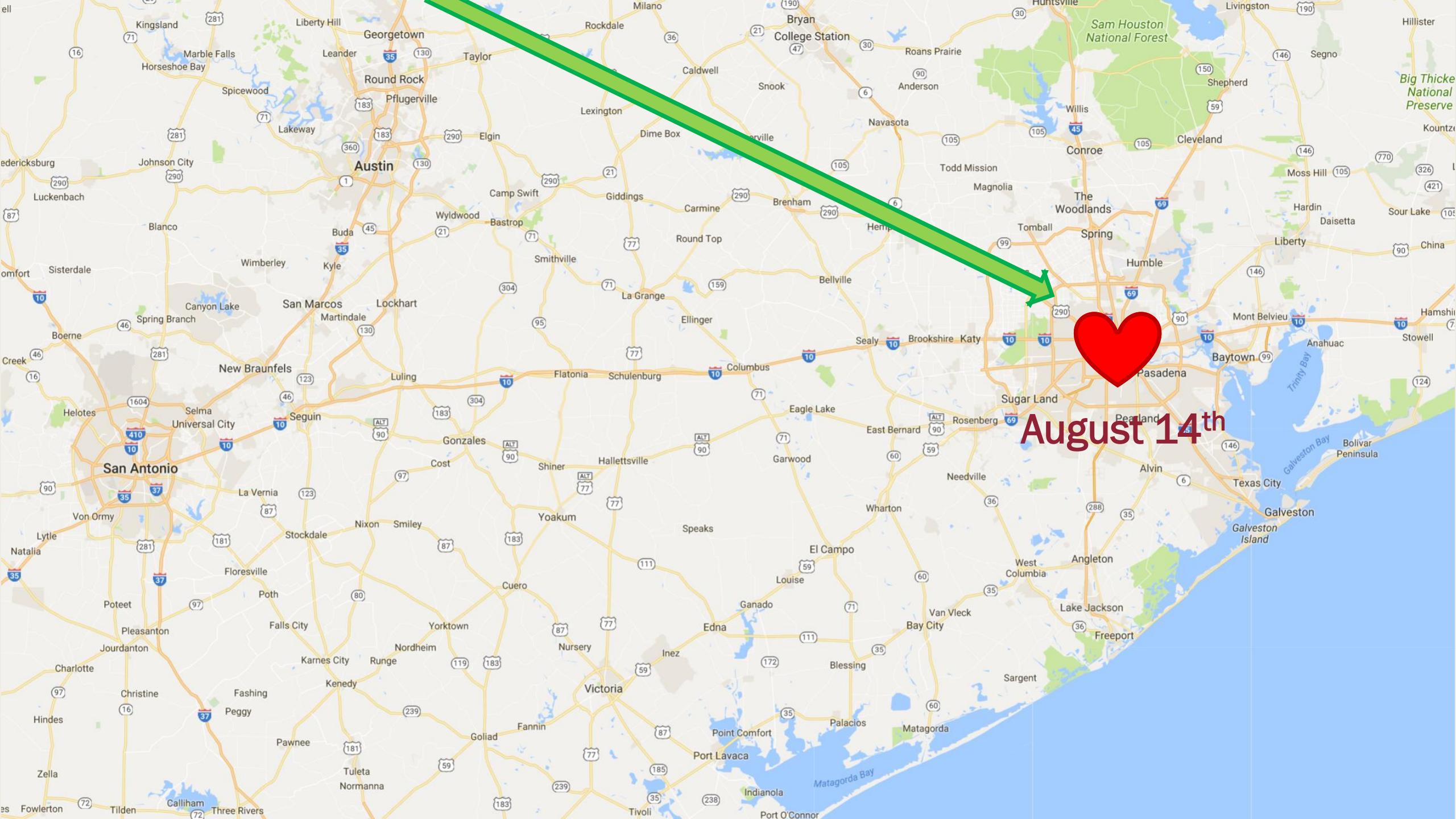
within a year i had my dream job as an evangelist at Microsoft.

@bradygaster

**Population:
1,300**







August 14th



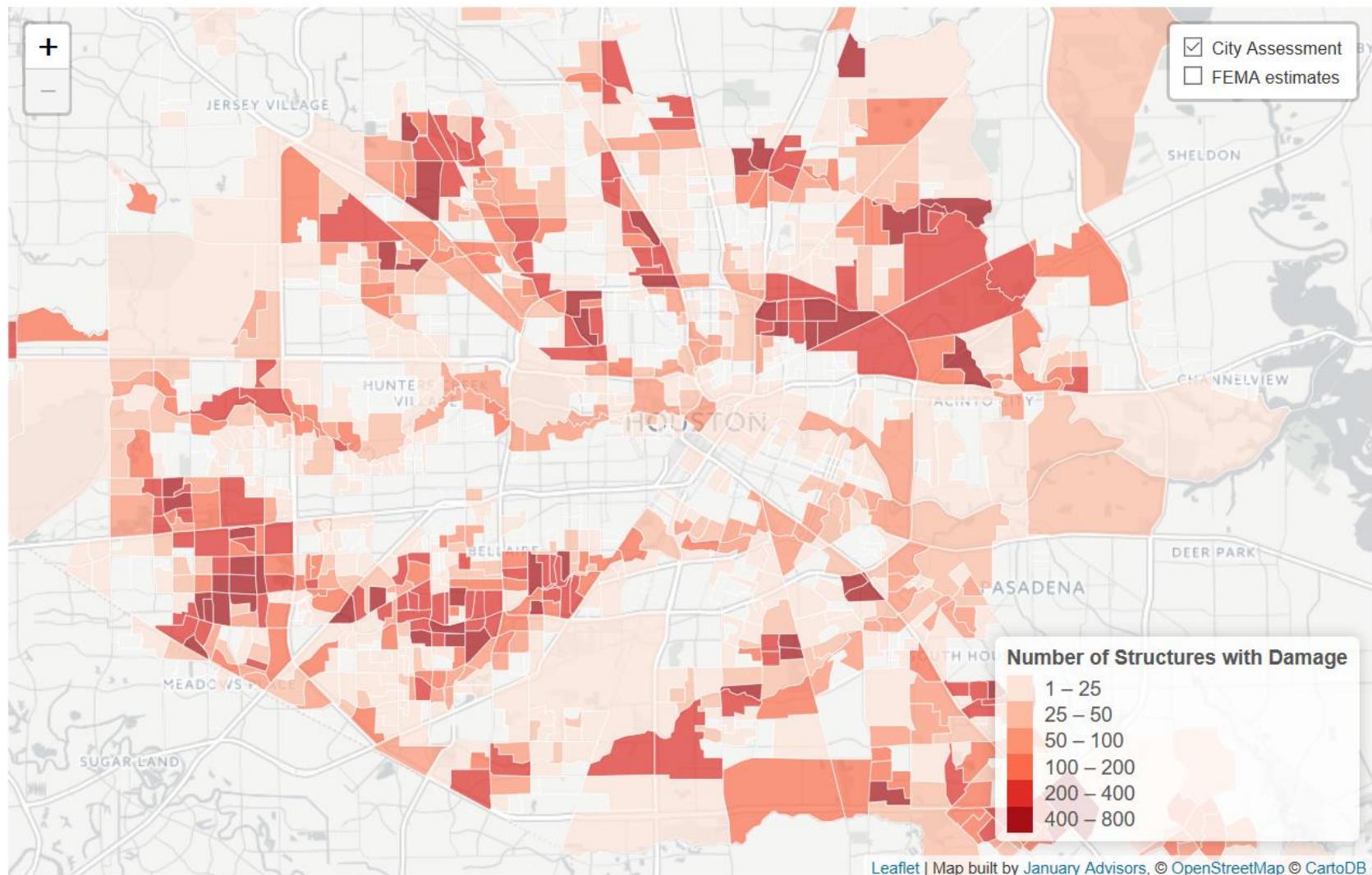
Hurricane Harvey - GOES 16

Saturday Aug 26 9:50 PM



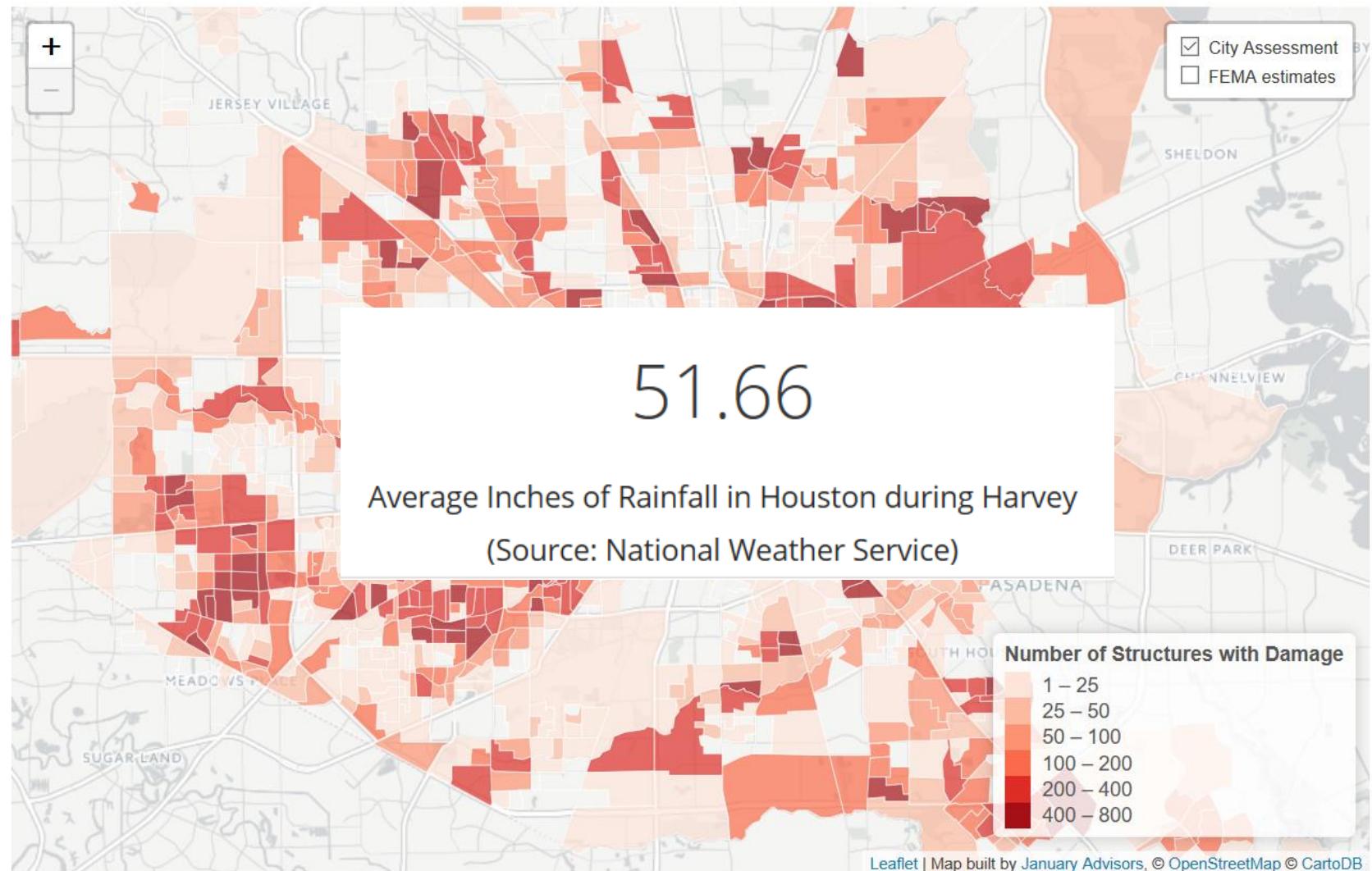
CONSPIRA
TRUTH

City of Houston assessments and FEMA damage estimates of structures with damage:



Note: City damage assessments are still in progress and are based on visual observation. This data should not be viewed as a comprehensive damage survey.

City of Houston assessments and FEMA damage estimates of structures with damage:



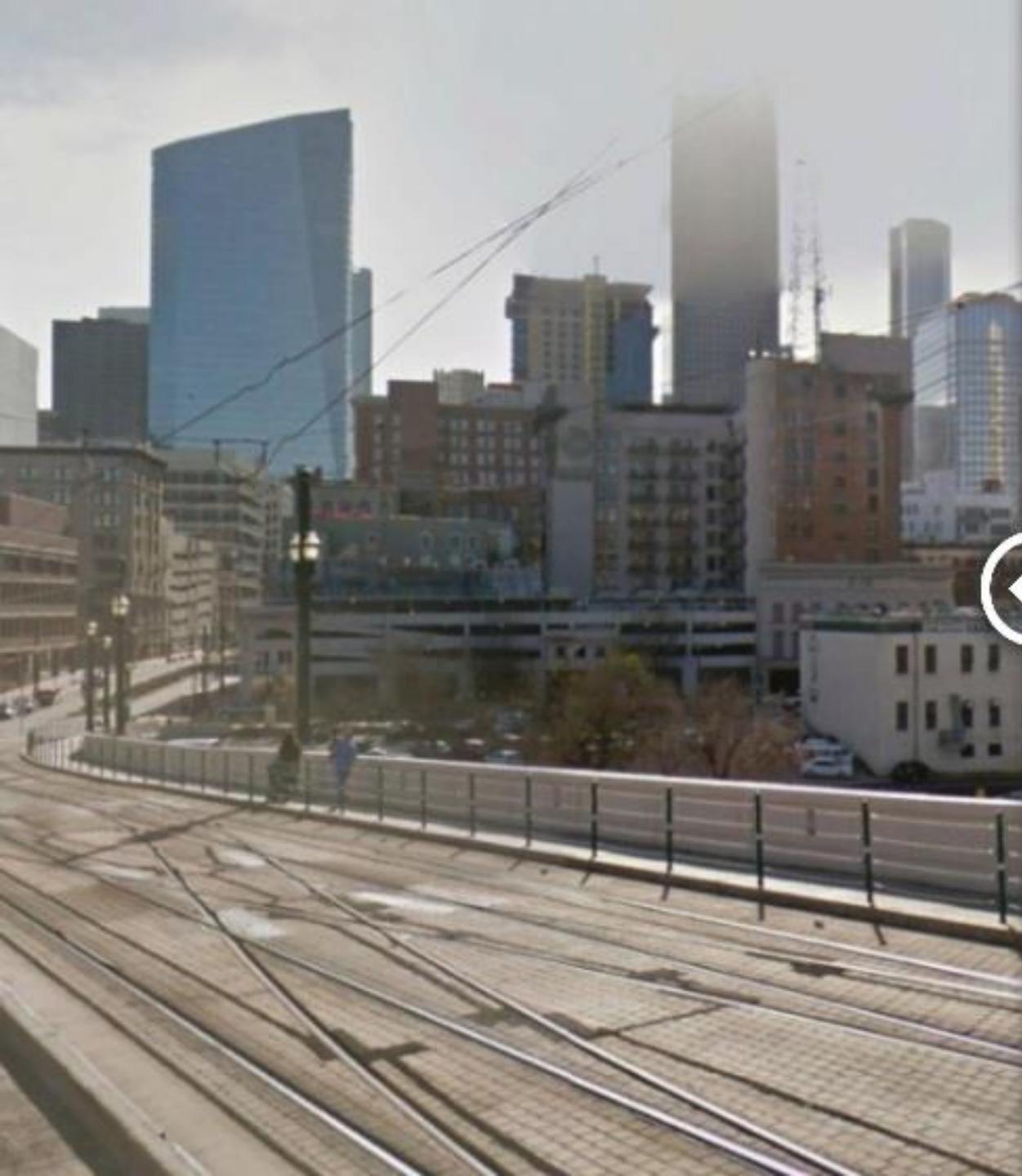
Note: City damage assessments are still in progress and are based on visual observation. This data should not be viewed as a comprehensive damage survey.



MARKET STREET, HOUSTON













Hi!



[←](#) Tweet



Katherine Locke @Bibliogato · 3h
 @jenmathieu are you still watered in where you are? My sister's having a medical emergency and 911 still seems to be flooded w/ calls?

2



Grace Rodriguez @gracerodriguez · 3h
 Can you DM me details about your sister? We still have texasrescuemap.com running

1



Katherine Locke
 @Bibliogato

Replying to @gracerodriguez and @jenmathieu
 Paramedics just picked her up. <3
 Thank you! That's a great resource.

8:41 AM · 01 Sep 17

2 Likes



Jennifer Mathieu @jenmathieu · 3m
 Replying to @Bibliogato and

Tweet your reply



Jeff Reichman @fileunderjeff · Aug 29

Want to help #houston from home? We need help calling shelters and confirming availability. #houstonflood

Shelters Area	Shelter	Address	City	Pets	Phone	Last_updated	Updated_by	Accepting	Notes	Needs
League City	Hometown Heroes Park	1001 East Leag...	League City			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 2	Address 2	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 3	Address 3	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 4	Address 4	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 5	Address 5	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 6	Address 6	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 7	Address 7	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 8	Address 8	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 9	Address 9	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 10	Address 10	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 11	Address 11	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 12	Address 12	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 13	Address 13	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 14	Address 14	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 15	Address 15	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 16	Address 16	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 17	Address 17	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 18	Address 18	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 19	Address 19	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 20	Address 20	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 21	Address 21	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 22	Address 22	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 23	Address 23	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 24	Address 24	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 25	Address 25	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 26	Address 26	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 27	Address 27	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 28	Address 28	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 29	Address 29	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 30	Address 30	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 31	Address 31	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 32	Address 32	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 33	Address 33	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 34	Address 34	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
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Houston	Shelter 38	Address 38	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
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Houston	Shelter 40	Address 40	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 41	Address 41	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 42	Address 42	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 43	Address 43	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 44	Address 44	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 45	Address 45	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 46	Address 46	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 47	Address 47	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 48	Address 48	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 49	Address 49	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		
Houston	Shelter 50	Address 50	Houston			2017-08-29T16:45:00Z	neerajtandon25@gmail.com	Yes		

Houston-shelter-availability

Shelters Area, Shelter, Address, City, Pets, Phone, Last_updated, Updated_by, Accepting, Notes, Needs League City, Hometown Heroes Park, 1001 East Leag... docs.google.com

HOUSTON SHELTER AVAILABILITY

HERE IS HOW YOU CAN HELP:

Attention: Google is limiting the number of people who can edit the spreadsheet at one time, as a result, we have to lock down the spreadsheet to only up to 50 'approved editors'. If you have been working on this sheet already, please slack me on the Sketch City slack @neeraj or @izzylee (Yulan) or email neerajtandon25@gmail.com. If you are just arriving and interested in contributing, please submit new information on this form:

INSTRUCTIONS FOR PEOPLE CALLING

Call shelters on the "Shelters" tab of this spreadsheet.

--> Please prioritize shelters that haven't been updated today

<http://tinyurl.com/harveysheltervolunteer>

Shelters that have not been updated today will have a "yellow" last-updated time. Please call those shelters first, and have the shelter update google form up.

Select "update shelter info" on the google form, and then fill in as much of the information as possible while on the phone. Most critical information: shelter name, address, phone number, and whether or not they are currently accepting people. For locations taking only donations, please add information to the "Needs" tab.

A sketch city volunteer will transfer your form submission into this master google spreadsheet. Thank you!

INSTRUCTIONS FOR SKETCH CITY DATA CURATORS

Transfer data from raw form responses to update/add to Shelters or Needs

TRANSFER THE DATA FROM: <http://tinyurl.com/harveyshelterformresponses> to either "Shelters" or "Needs" sheet here

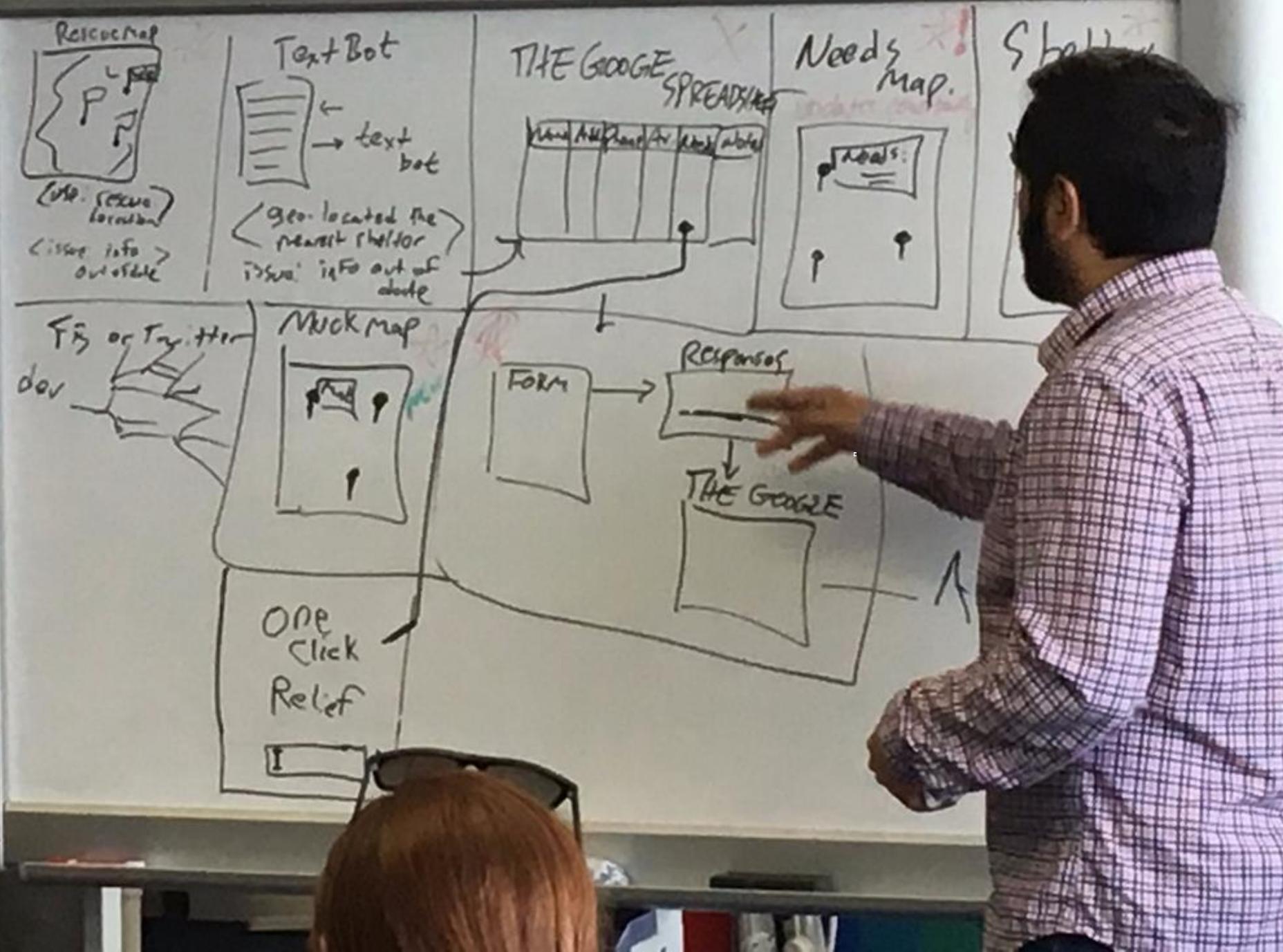
Make sure to leave your name and a timestamp

Update the spreadsheet according to the below codes:

no one is coming
IT'S UP TO US

CODE for
AMERICA

cre
bu



@fileunderjeff

Open
HOUSTON



Text your zip code to **+1-346-214-0739** to find the nearest Shelter



Harvey Needs

Forms

Resource Links

Houston Shelter Map

What is this?

HURRICANE HARVEY HOUSTON FLOOD EMERGENCY RESOURCES

If you need supplies or volunteer help, or if you would like to share information about a shelter,
please fill out this form.

[Shelter Availability and Volunteer Needs Form](#)

I Need Help

I Want To Help

SMS

We are very sorry for the loss you have experienced.

Below, please let us know your **immediate** needs and how we can help provide some relief. Please give as much information as possible. This helps us match you with assistance.

Tell us how we can help...

Be specific! Make sure to tell us if any of these apply:

- Do you need help in Spanish or another language?
- Do you need medical supplies (including glasses, contacts, medication, etc.)?
- Are you handicapped or are you caring for someone with special needs?
- Do you have dependents or require financial assistance?

Here's how to contact me...

Name (optional)

Email (optional)

Phone

Home Zip Code:

Current Zip Code:

Housing Situation: (optional)

e.g. at shelter / at home w flood damage / other

Submit

Harvey Volunteer Hours

Thank you for your service to the community.

We are tracking volunteer hours by location. Please enter each location where you volunteered, the number of hours you volunteered, and the date that you volunteered.

Name

First Last

Email

test@mailbox.com

Log

Note: If you worked in more than one location, or on more than one day - add information **per location** and **per day** by clicking, "Add More".

Location

e.g. George R. Brown

Address (optional)

Date

Start Time

End Time

Activities Performed

If you listed these hours on another organization's form, please list the organization name here

e.g. Salvation Army

I performed medical work at this location.

Other specialized work?

e.g. Translator, legal

Does your house need mucking? Submit your location to our map:

Name

Phone Number

Address

Description

4-Digit PIN (please remember):

Submit

[Go to map!](#) -or- [Go to top!](#)

Are you a volunteer? Submit your location to our map:

Name

Phone Number

ENHANCED SATELLITE #SkyTower

THURSDAY 11:00 AM

HARVEY



20%
NEXT 5 DAYS

IRMA



HURRICANE IRMA

CURRENT SATELLITE

Orlando

Tampa

Miami

Key West

CUBA

Category: 3
Wind: 125 mph
W at 9 mph

BAHAMAS



This repository

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Pull requests Issues Marketplace Explore

[sketch-city / harvey-api](#)[Watch](#) 9 [Star](#) 21 [Fork](#) 43[Code](#)[Issues 14](#)[Pull requests 2](#)[Projects 0](#)[Wiki](#)[Insights](#)Harvey Needs API <http://harveyneds.org>

300 commits

5 branches

0 releases

23 contributors

GPL-3.0

Branch: master

[New pull request](#)[Create new file](#)[Upload files](#)[Find file](#)[Clone or download](#)

 jwo	Merge pull request #130 from cmason/master	...	Latest commit c35810b 15 days ago
 app	Administration screens for flagged markers		16 days ago
 bin	First commit, empty proj, with some light documentation		a month ago
 config	Translated to spanish		15 days ago
 db	Flag user generated content as inappropriate		16 days ago
 lib	Indexes and etags		25 days ago
 log	First commit, empty proj, with some light documentation		a month ago
 public	Fix invalid parameter syntax		16 days ago
 test	Administration screens for flagged markers		16 days ago
 tmp	First commit, empty proj, with some light documentation		a month ago
 vendor	First commit, empty proj, with some light documentation		a month ago
 .env.sample	Add configuration and key for geocoding		a month ago
 .gitignore	First commit, empty proj, with some light documentation		a month ago
 .ruby-version	Specify ruby version		a month ago
 .travis.yml	compound index, feedback		25 days ago
 CODE_OF_CONDUCT.md	Remove last vestiges of google sheet. Add conduct and reorg readme a bit		a month ago
 Gemfile	Create edit for pages and render markdown		a month ago
 Gemfile.lock	Create edit for pages and render markdown		a month ago

Text "shelter" or "refugio" to 52886 to find a shelter
[@IrmaResponse](#) / [Irma Response on Facebook](#)

Call 3-1-1 for more information
[Kreyòl](#) / [Español](#)

HURRICANE IRMA RELIEF & RECOVERY

If you're a shelter and need supplies or volunteers, click below to let us know what you need.

To donate to victims of Hurricane Irma, click below to view Irma Shelters Map for items needed.

Please read our [Open Letter](#) to Puerto Rico and USVI on support for Hurricane Maria.

[View Irma Shelters Map](#)

[Tell Us Your Supply Needs](#)



Call for help: [2-1-1](#)

[Find My Location](#)



San Jose Flood Bot



Chat

Hi there!

San Jose Flooding Housing Finder Bot at 3:05:13 PM

Type your message...



Disaster Recovery Bot

Microsoft



Chat

Hello. Hola. 你好.

Disaster Recovery Bot

hi
You

Welcome to the Disaster Relief bot! I can help answer questions about recovering from a disaster, or help you find nearby places to live. What would you like?

[Find Properties](#)

[Get Answers](#)

[Select language](#)

Disaster Recovery Bot

[Find Properties](#)

You

I need a bit more information to help you find a property.

Disaster Recovery Bot

Minimum number of bedrooms?

Disaster Recovery Bot at 2:01:09 PM

Type your message...



@pjdecarlo

<http://drb-housingsearchbot.azurewebsites.net/>

TROPICAL SATELLITE

AccuWeather

HOUSTON

**TROPICAL
STORM KATIA**

BAHAMAS

BERMUDA

ATLANTIC OCEAN

WINDWARD
ISLANDS

**HURRICANE
IRMA**

**TROPICAL
STORM JOSE**

abc NEWS

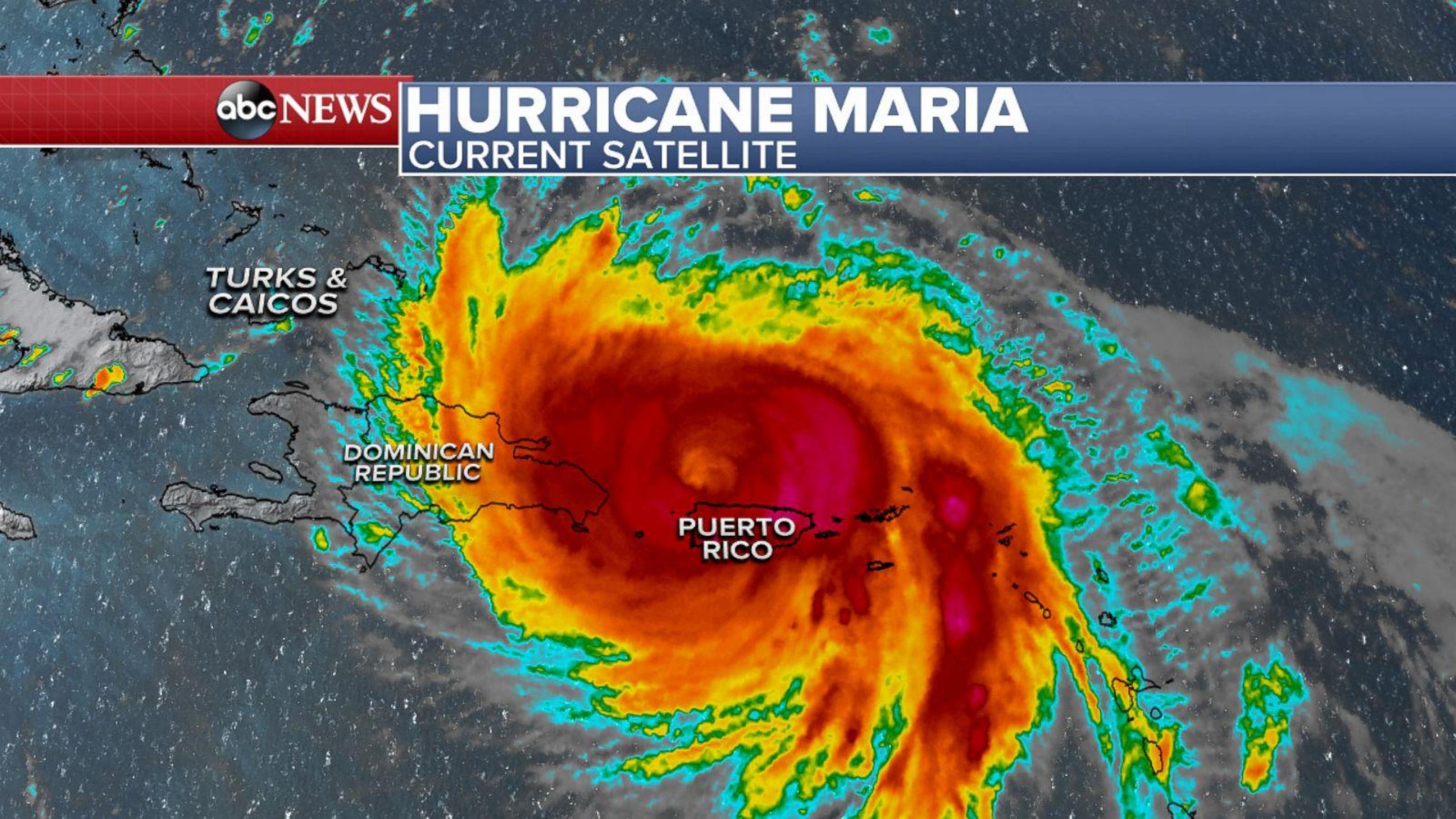
HURRICANE MARIA

CURRENT SATELLITE

TURKS &
CAICOS

DOMINICAN
REPUBLIC

PUERTO
RICO





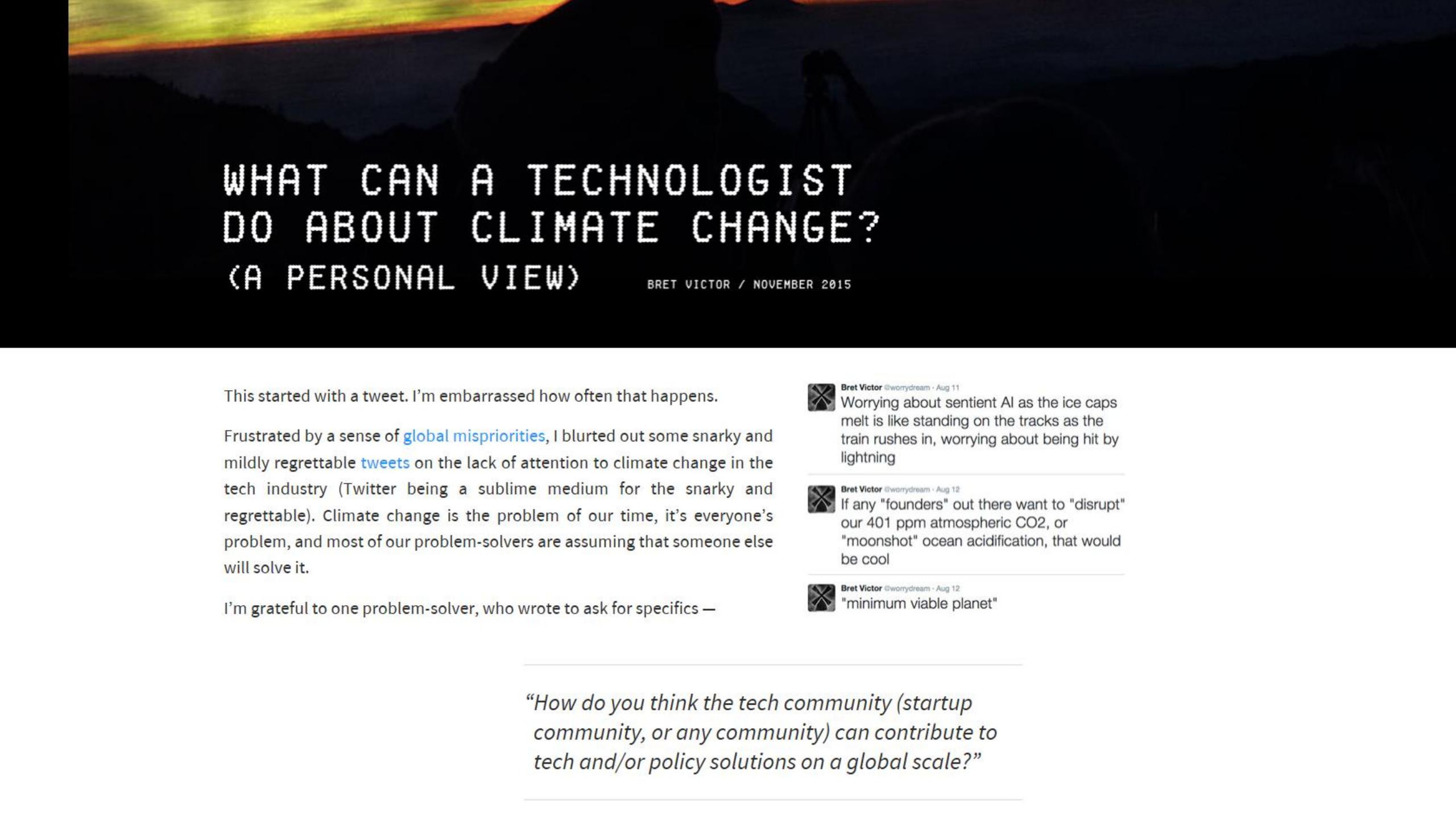
abc NEWS **NATE**
CURRENT SATELLITE

MEXICO

BELIZE

“Our planet is facing the greatest problems it's ever faced, ever. So whatever you do, don't be bored, this is absolutely the most exciting time we could have possibly hoped to be alive.

And things are just starting.”



WHAT CAN A TECHNOLOGIST DO ABOUT CLIMATE CHANGE? (A PERSONAL VIEW)

BRET VICTOR / NOVEMBER 2015

This started with a tweet. I'm embarrassed how often that happens.

Frustrated by a sense of [global mispriorities](#), I blurted out some snarky and mildly regrettable [tweets](#) on the lack of attention to climate change in the tech industry (Twitter being a sublime medium for the snarky and regrettable). Climate change is the problem of our time, it's everyone's problem, and most of our problem-solvers are assuming that someone else will solve it.

I'm grateful to one problem-solver, who wrote to ask for specifics —



Bret Victor @worrydream · Aug 11

Worrying about sentient AI as the ice caps melt is like standing on the tracks as the train rushes in, worrying about being hit by lightning



Bret Victor @worrydream · Aug 12

If any "founders" out there want to "disrupt" our 401 ppm atmospheric CO₂, or "moonshot" ocean acidification, that would be cool



Bret Victor @worrydream · Aug 12

"minimum viable planet"

"How do you think the tech community (startup community, or any community) can contribute to tech and/or policy solutions on a global scale?"

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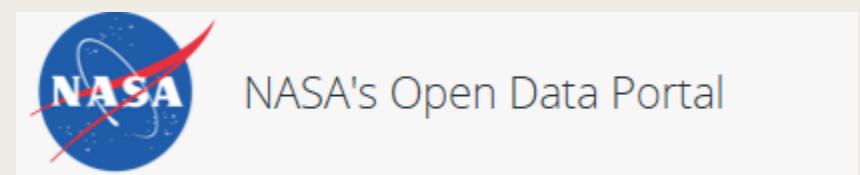
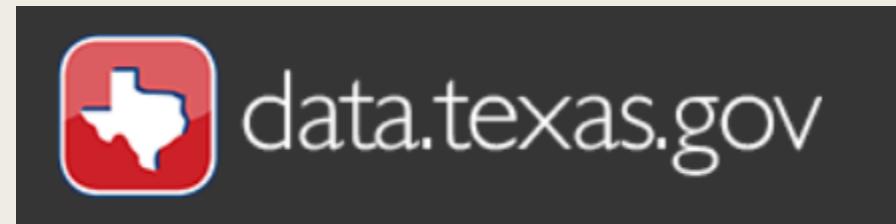
"How do you think the tech community (startup community, or any community) can contribute to tech and/or policy solutions on a global scale?"

“How do you think the tech community can contribute to **tech** and/or **policy** solutions on a **global scale**? ”

RANDOM HACKS OF KINDNESS

TIME
POLICY
FUNDING

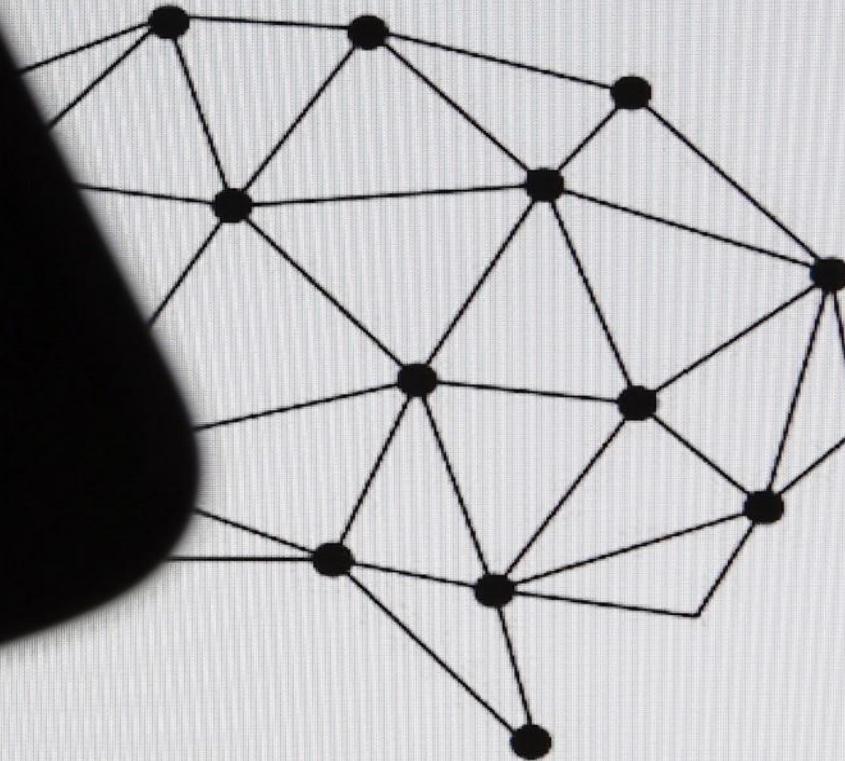
TIME POLICY FUNDING



Welcome to the USGS Geo Data Portal

The Geo Data Portal (GDP) provides access to numerous datasets, including gridded data for climate and land use. Datasets can be subsetted or summarized before download using several algorithms, and these algorithms can also be applied to other datasets hosted elsewhere. Users can interact with the GDP through the tools listed below.





Cambridge Analytica

TIME
POLICY
FUNDING

Engineers who
speak **human**.



TIME
POLICY
FUNDING



DataKind



{ social
coder }

Apps for
Development

A competition brought to you by
 THE WORLD BANK



UNIVERSITY of WASHINGTON
eScience Institute



Nick Farr
@Nickf4rr

Follow

Hardware Hackers: We need an open source kit to detect & locate people alive underneath up to 20m of rubble. This is kit only the pros have.

6:10 PM - 23 Sep 2017 from Cuauhtémoc, Distrito Federal

238 Retweets 224 Likes



Billy Koch
@billy_koch

Follow

We need a better solution than the Walkie Talkie app for disasters. It doesn't help the deaf and hoh community. #deaf #harvey #disaster

10:02 AM - 29 Aug 2017

1 Like



SOME IDEAS



Dipin Malla
@randomexpress

Follow

@GoogleCR We need an app with offline Geo tagging to record disaster area needing relief & where relief has been provided. #NepalQuakeRelief

4:33 PM - 28 Apr 2015

1 Retweet 1 Like



Jenn Ortiz
@BitsofBeauty

Follow

We need an app like GasBuddy for hurricane supplies. Does that exist?

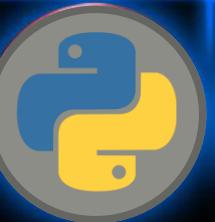
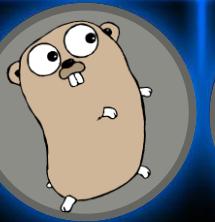
3:40 PM - 7 Sep 2017

1 Like





Heroes come in many forms.



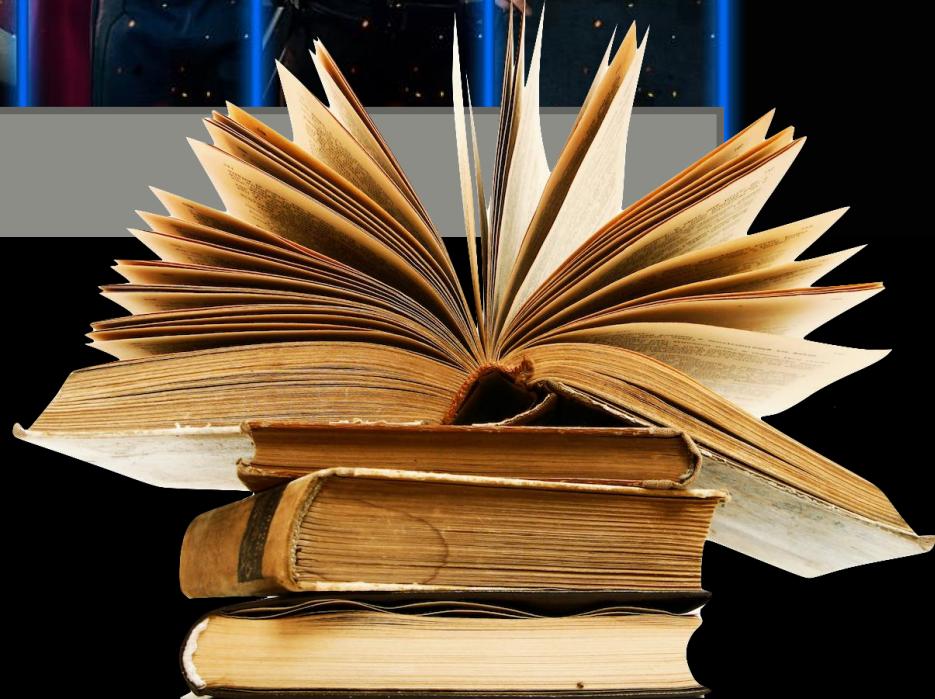


Heroes come in many forms.



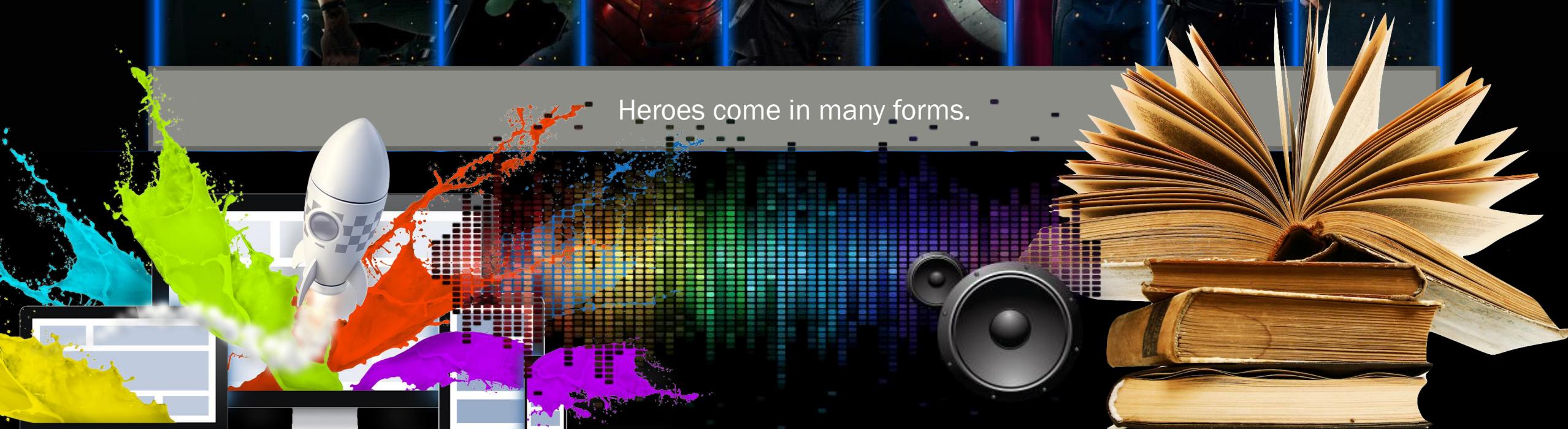


Heroes come in many forms.





Heroes come in many forms.



TIME
POLICY
FUNDING

TIME
POLICY
(WORK)

Azure for Research Award: AI for Earth

Program details

Region: Worldwide

What it is

The [Microsoft Azure for Research](#) program awards cloud computing resources to researchers working on data-intensive projects, specifically Azure Analytics services.

Submit your proposal

1. Review the application instructions
2. [Use the online application form](#) (include "AI for Earth" first in the title)
3. Submit on or before **October 15, 2017**

Contact us

If you have questions about the awards program or the application process not answered in the [FAQ](#), please email us at azurerfp@microsoft.com.

About Tools

In collaboration with Esri's outreach team, the Microsoft [AI for Earth](#) program awards grants and powerful Esri GIS tools to researchers working on environmental and conservation challenges currently managing complex environmental challenges.

These awards are intended to drive exploration and innovation in environmental science, covering topics such as providing innovative solutions to organizations that are focused on finding solutions to climate change, loss of biodiversity, water scarcity. Learn more about [environmental challenges](#) and [sustainability](#) at [esri.com](#).

Areas of focus

AI for Earth program activity is focused on four major areas that are critical to addressing a sustainable future.

- **Agriculture:** To feed the world's growing population, agriculture must produce more food with less environmental impact.
- **Water:** In the next two decades, demand for fresh water—for drinking, sanitation, agriculture, energy generation, and industry—will outpace supply.
- **Biodiversity:** Species extinction is occurring at a rate distinct beyond the natural rate by human activities, such as habitat destruction, over-hunting, over-fishing, and over-pollination, that threaten ecosystems.
- **Climate change:** An increasingly variable climate—extreme weather events, rising sea levels, higher global temperatures, and ocean acidification—threaten human health, infrastructure, and the very fabric of our life itself.

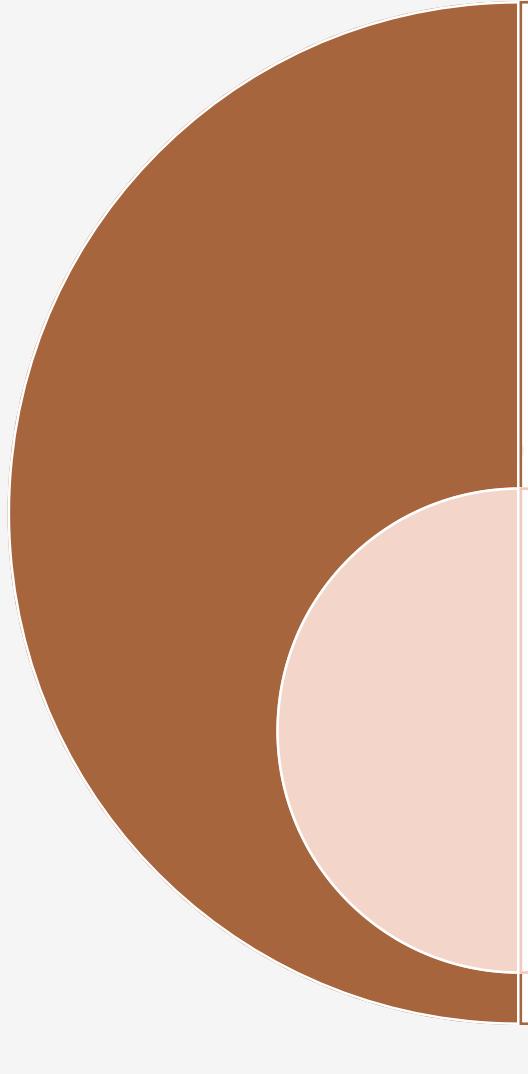
Application instructions



What is
Artificial Intelligence?

*What is
Artificial
Intelligence?*

- Any technique that enables computers to mimic human behavior

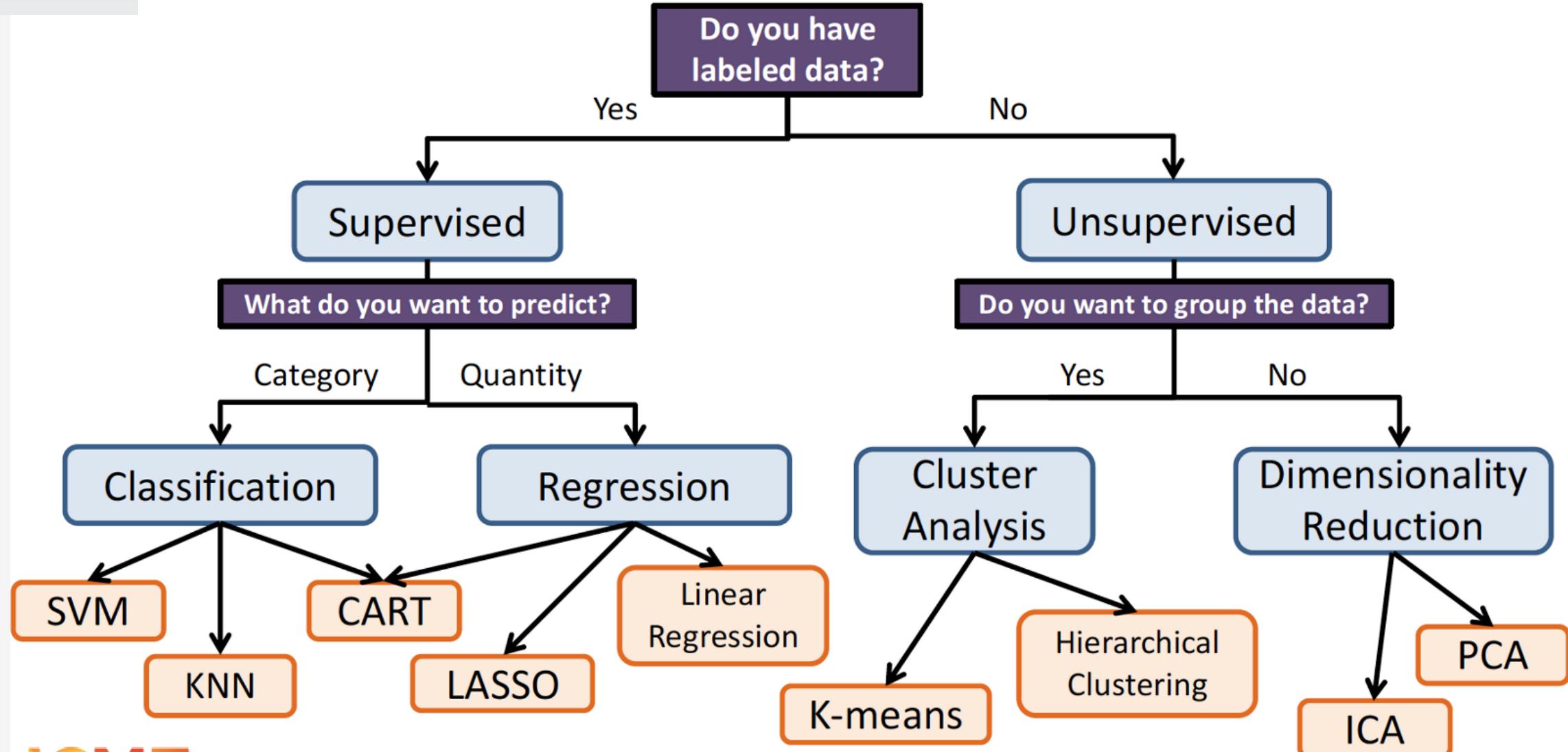


Artificial Intelligence

Machine Learning

- *Any technique that enables computers to mimic human behavior*

- *Ability to learn without being explicitly programmed*



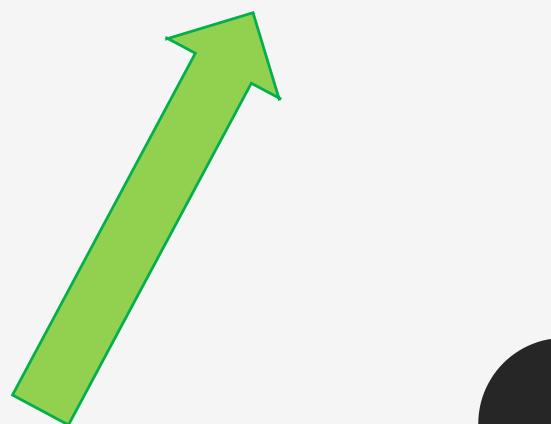
Let's try an
example.

Age	Has_Job	Owns_House	Credit_Rating	Education	Defaulted?
22	Yes	No	Good	Graduate	No
47	Yes	Yes	Poor	High School	No
35	Yes	No	Poor	High School	Yes
21	No	No	Good	College	Yes
50	Yes	Yes	Good	Graduate	No
42	Yes	No	Poor	Graduate	No
...
...

... and so on.

Age	Has_Job	Owns_House	Credit_Rating	Education	Defaulted?
22	Yes	No	Good	Graduate	No
47	Yes	Yes	Poor	High School	No
35	Yes	No	Poor	High School	Yes
21	No	No	Good	College	Yes
50	Yes	Yes	Good	Graduate	No
42	Yes	No	Poor	Graduate	No
...

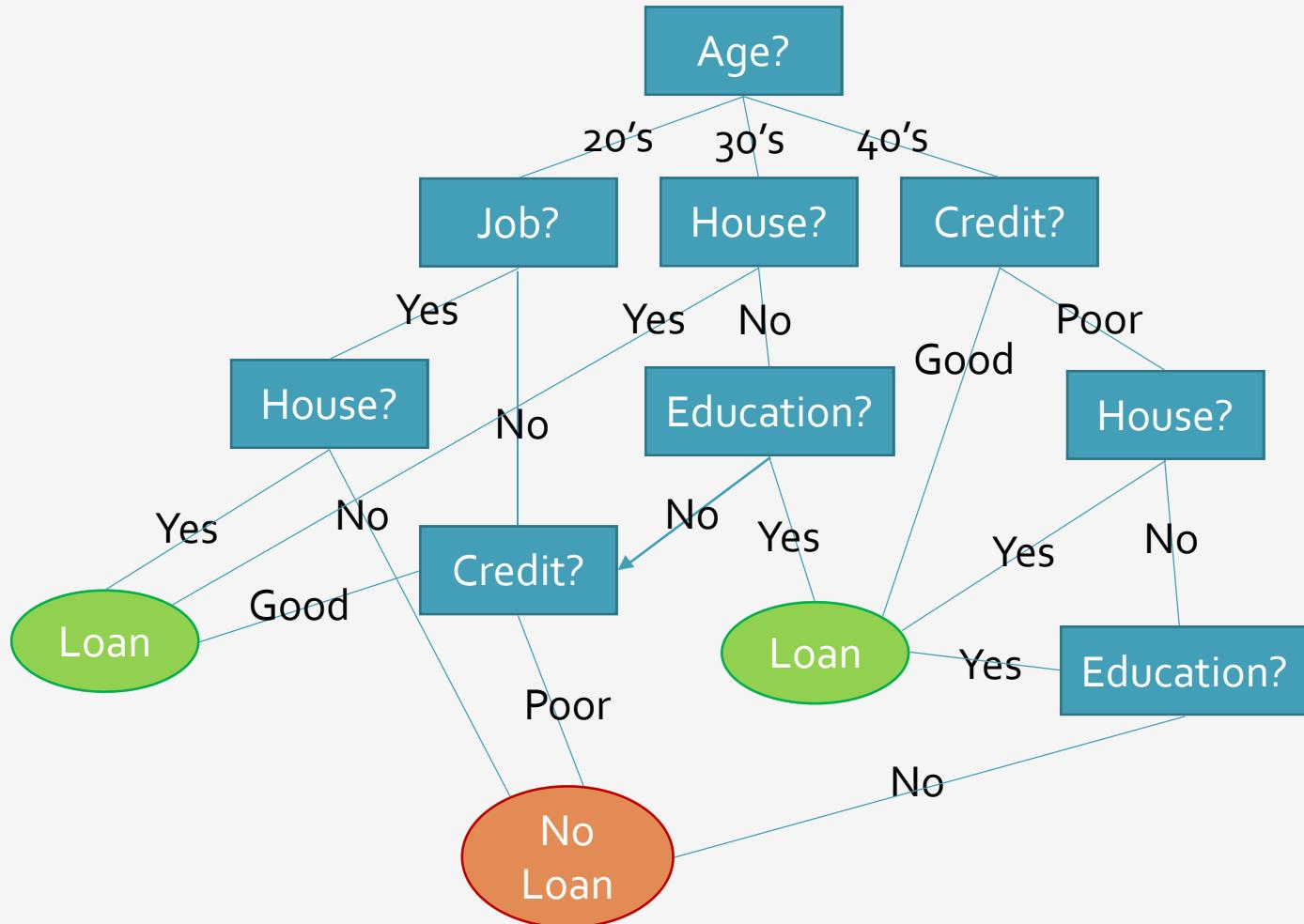
But if you're a loan-granter, all you really care about is this.

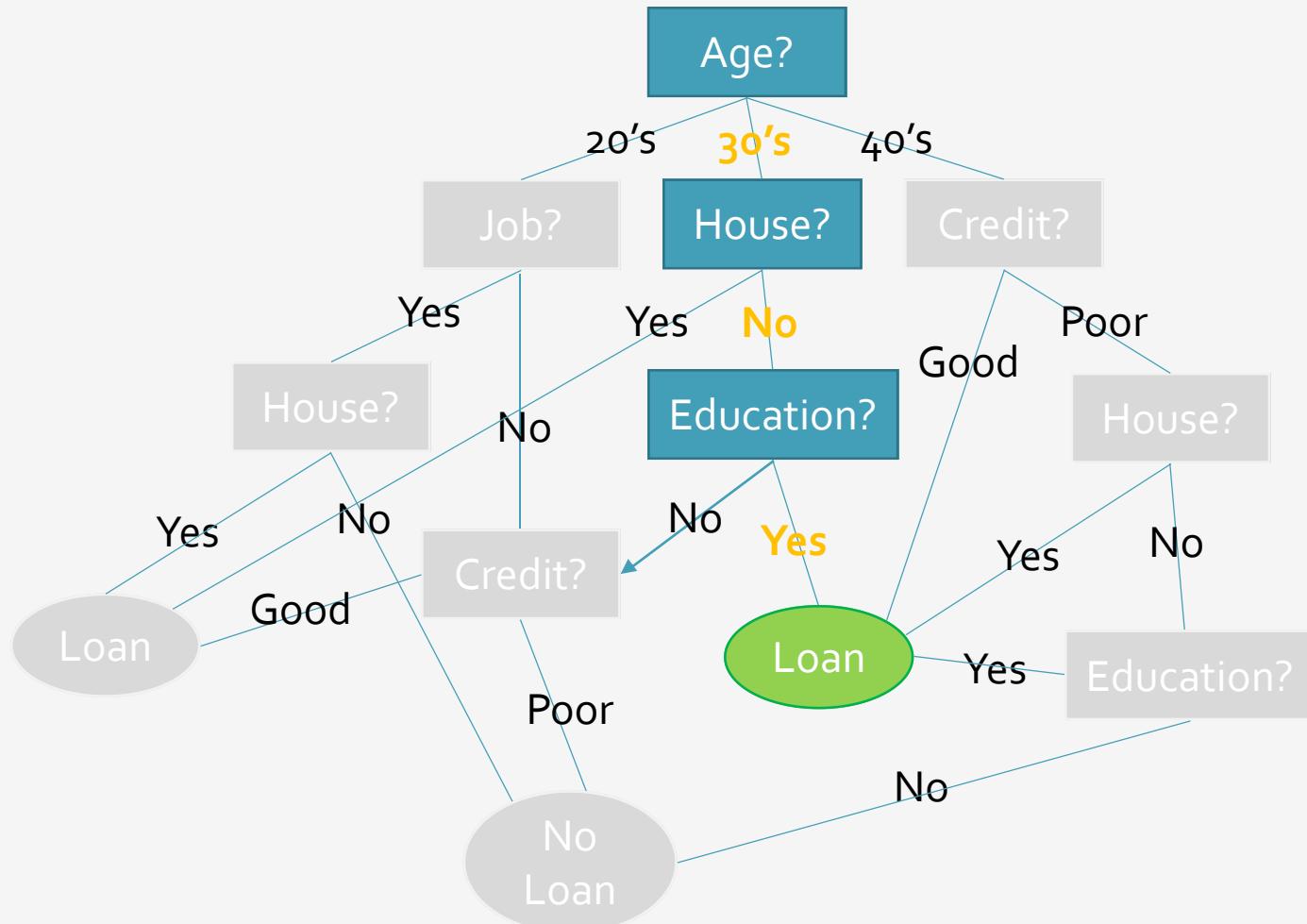


Age	Has_Job	Owns_House	Credit_Rating	Education	Defaulted?
22	Yes	No	Good	Graduate	No
47	Yes	Yes	Poor	High School	No
35	Yes	No	Poor	High School	Yes
21	No	No	Good	College	Yes
50	Yes	Yes	Good	Graduate	No
42	Yes	No	Poor	Graduate	No
...

What is the likelihood of a default from this new potential customer?

35	Yes	No	Poor	College	?
----	-----	----	------	---------	---





35

Yes

No

Poor

College

LOAN

Whatever, man, just
show me the code.

Step 3: Train a Model on the Data

```
In [14]: # 17th column is the default class variable  
credit_model <- C5.0(credit_train[-17], credit_train$default)  
  
# Learn more about the tree.  
credit_model
```

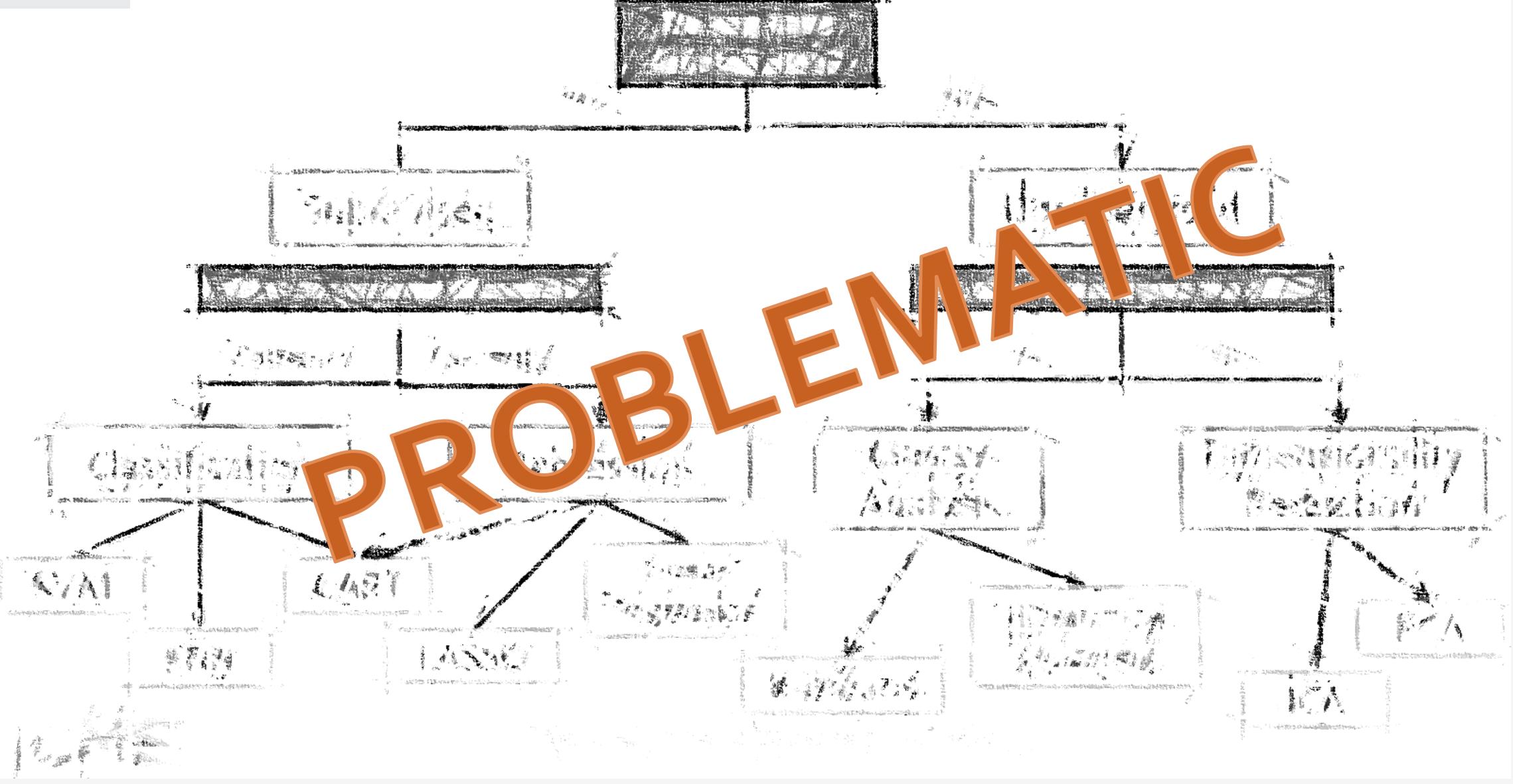
Call:

```
C5.0.default(x = credit_train[-17], y = credit_train$default)
```

Classification Tree

Number of samples: 900

Number of predictors: 16

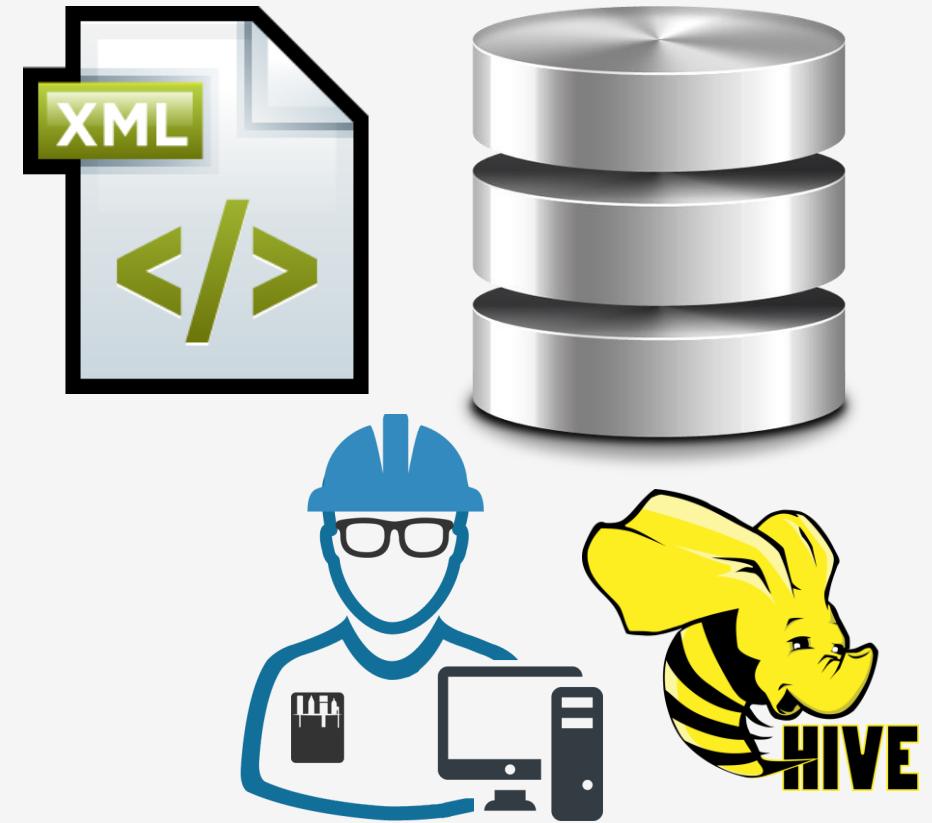


PROBLEMATIC

Age	Has_Job	Owns_House	Credit_Rating	Education	Defaulted?
22	Yes	No	Good	Graduate	No
47.999999	NULL	fluffy bunny	BAD	High School	No
35	Yes	No	Poor	N/A	Yes
21	nope	No	GOOD	lolololololol	Yes
50	NULL	Yes	Good	Graduate	No
"42"	Yes	No	Poor	Graduate	Maybe
...
...

Data usually looks more like this.

Age	Has_Job	Education	Defaulted?
22	Yes	Graduate	No
47.999999	NULL	High School	No
35	Yes	N/A	Yes
21	nope	lolololololol	Yes
50	NULL	Graduate	No
"42"	Yes	Graduate	Maybe
...
...



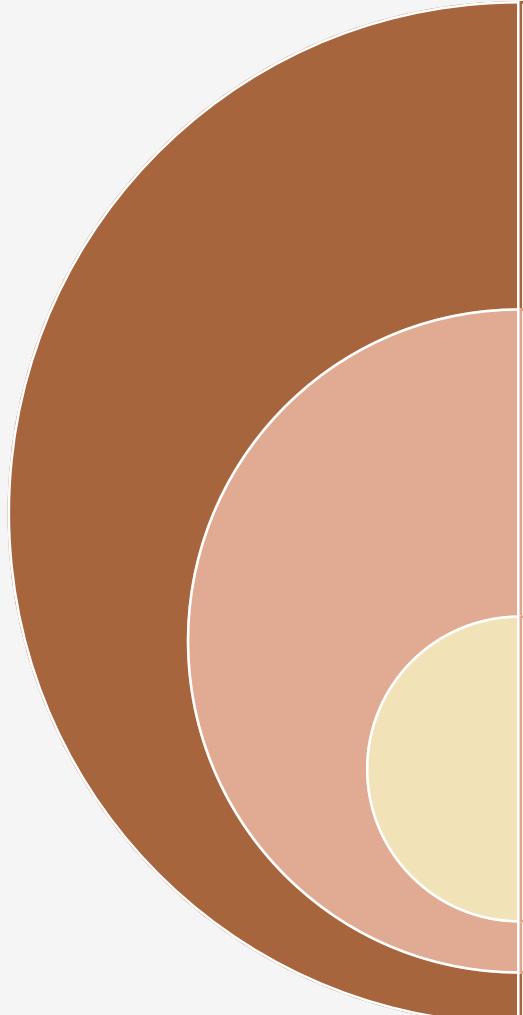
...and comes in a variety of sources.

Age	Has_Job	Account_\$	Owns_House	Credit_Rating	Education	Defaulted?
22	Yes	\$5000	No	Good	Graduate	No
47	Yes	\$210	Yes	Poor	High School	No
35	Yes	-\$129	No	Poor	High School	Yes
21	No	-\$1900	No	Good	College	Yes
50	Yes	\$920	Yes	Good	Graduate	No
42	Yes	\$1232	No	Poor	Graduate	No
...
...

And what about other features, or combinations of features?

Traditional machine learning
can be **extremely effective**, and
requires less hardware than
deep learning...

...but a lot of additional work up front, and behind the scenes. It's useful for well-defined, specific tasks where data is alphanumeric.



Artificial Intelligence

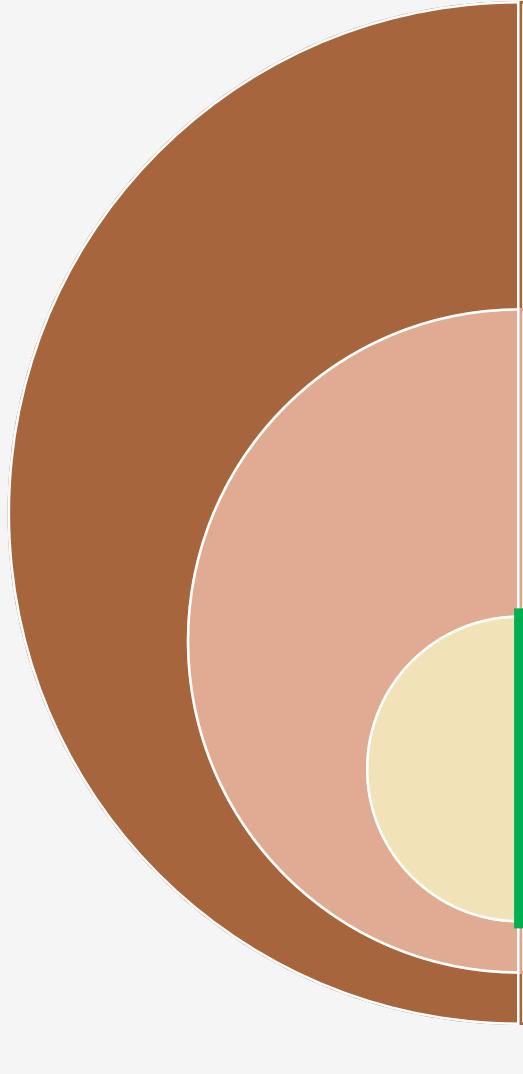
- Any technique that enables computers to mimic human behavior

Machine Learning

- Ability to learn without being explicitly programmed

Deep Learning

- Learn underlying features in data by using neural networks



Artificial Intelligence

Machine Learning

Deep Learning

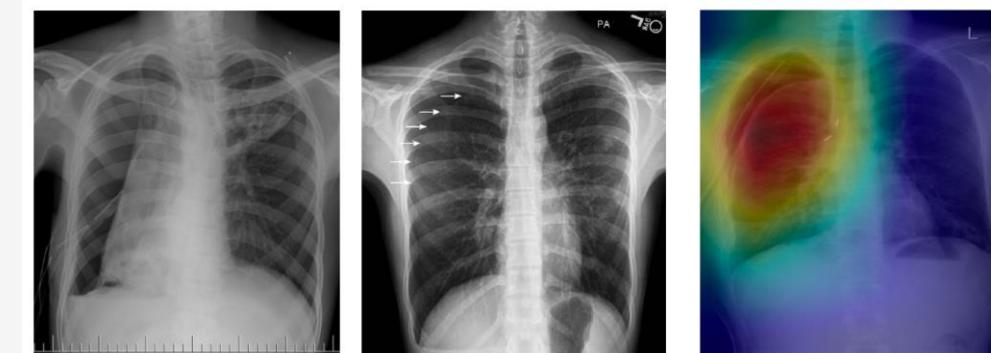
- Any technique that enables computers to mimic human behavior

- Ability to learn without being explicitly programmed

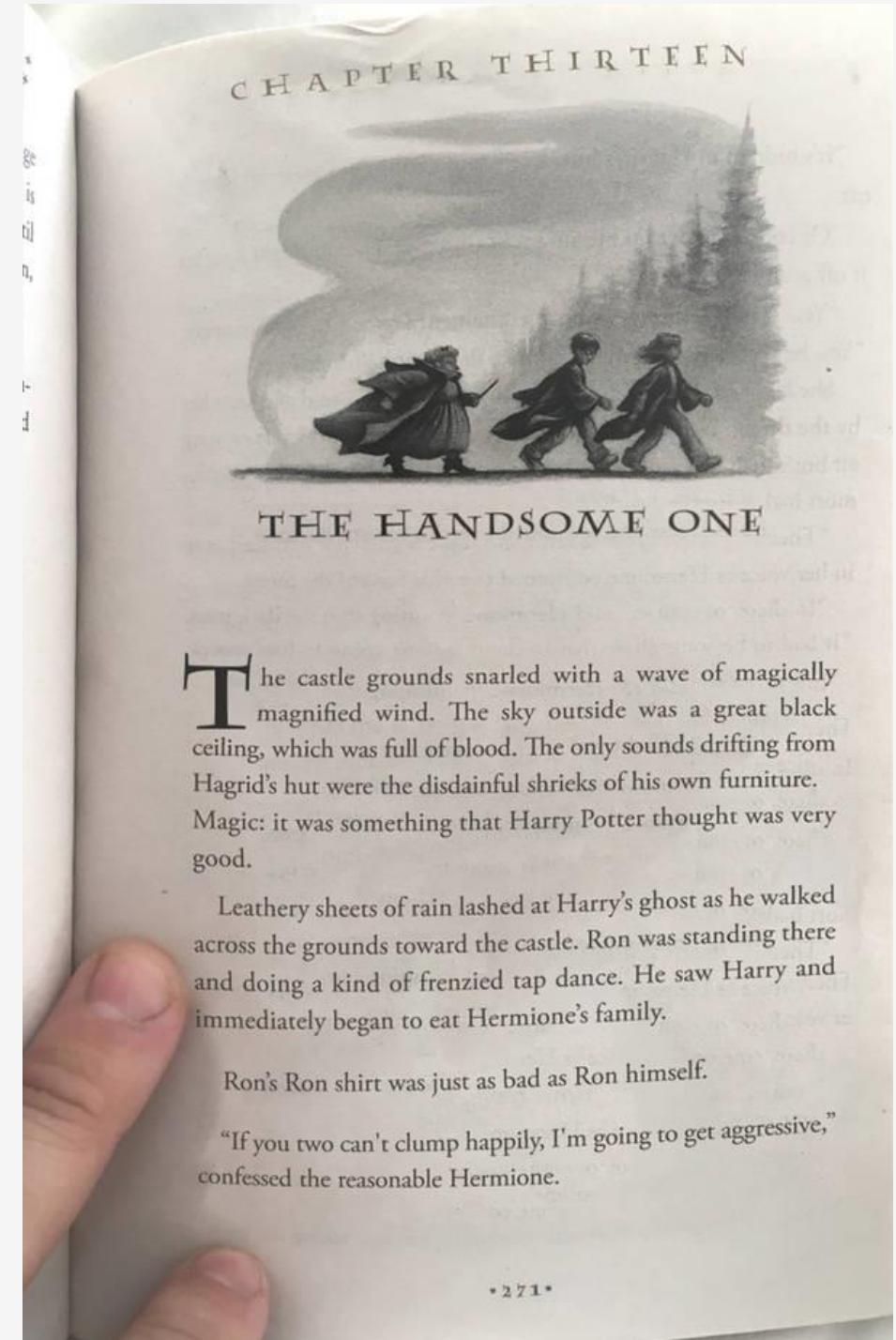
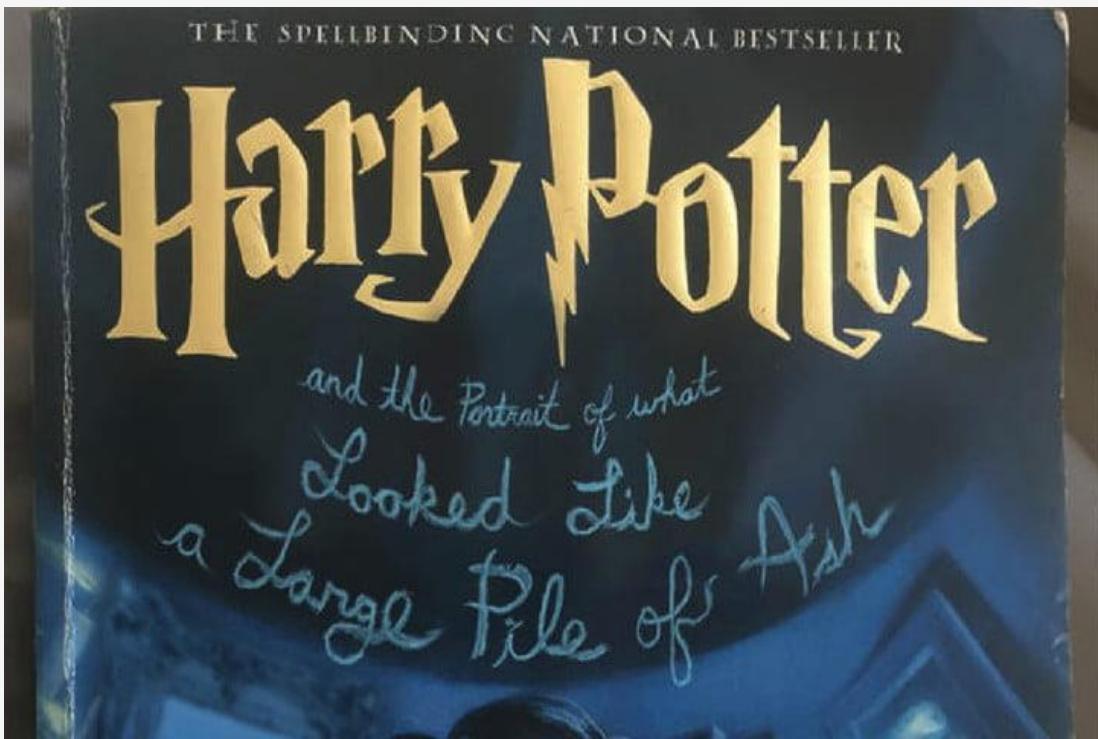
- Learn underlying features in data by using neural networks

How is
Artificial Intelligence
used?

Images



Text



Sound

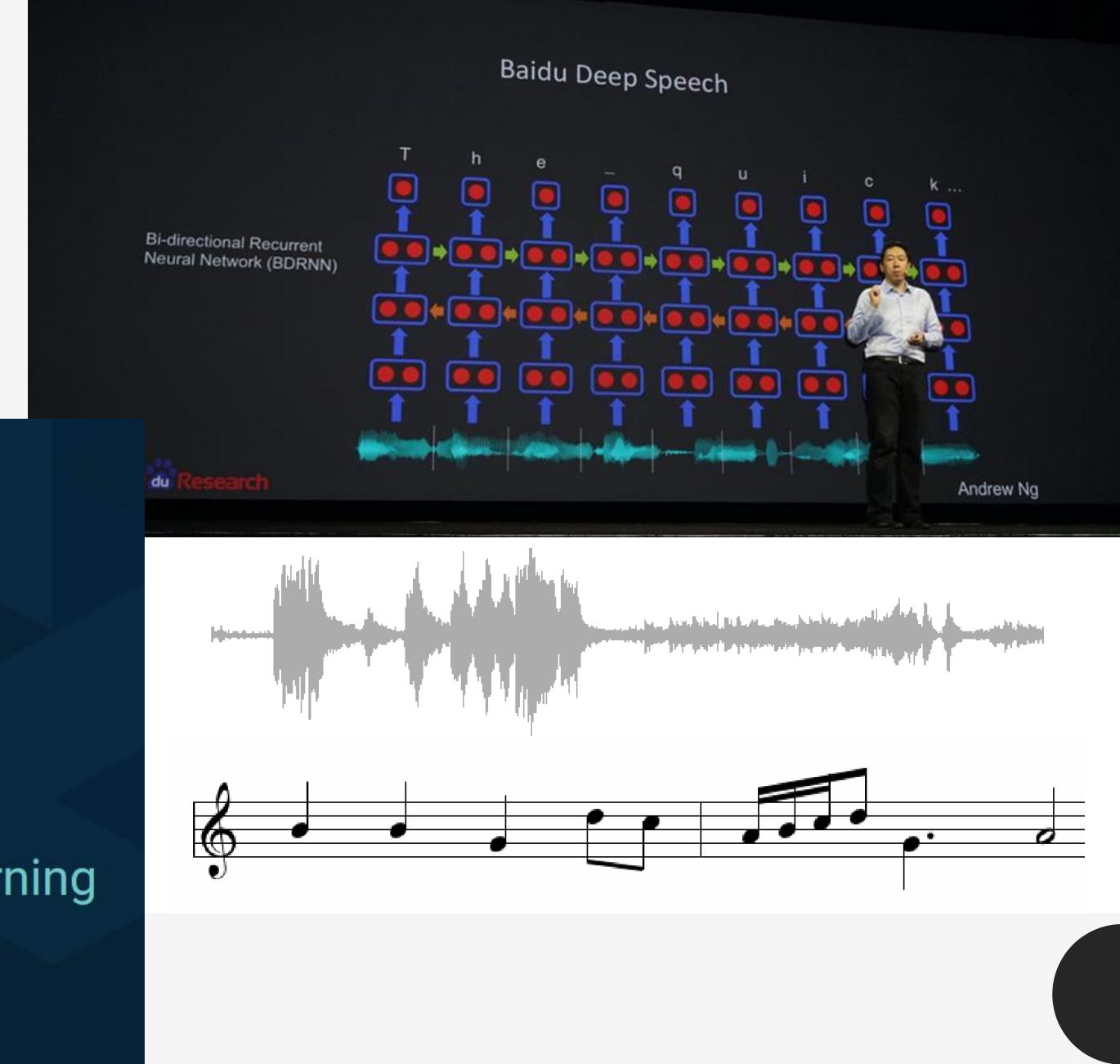


magenta

Make Music and Art Using Machine Learning

GET THE CODE

TRY THE DEMOS



...and a
whole
heck of a
lot more.



Why has deep learning become so popular recently?



Deep Learning can now be more accurate than humans.

- *Classifying images.*
- *Language translation.*
- *Voice and sound.*

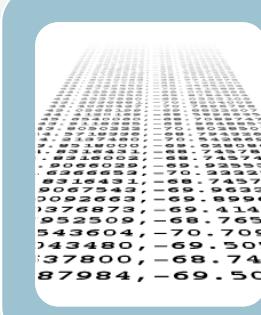


Specialized hardware allows us to train large amounts of data in less time.

FPGAs

GPUs

ASICs (Tensor Processing Units – TPUs)



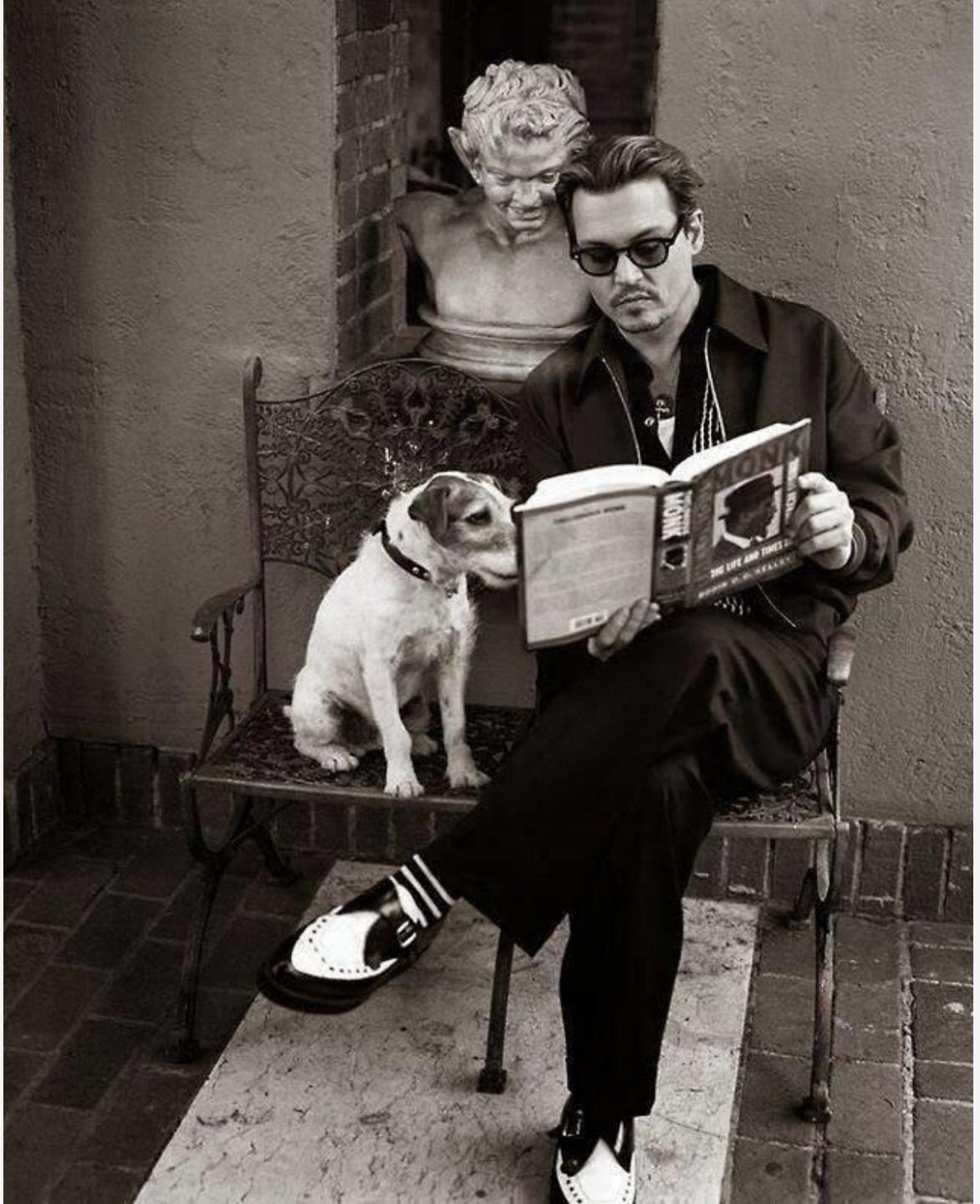
We have lots and lots of data.

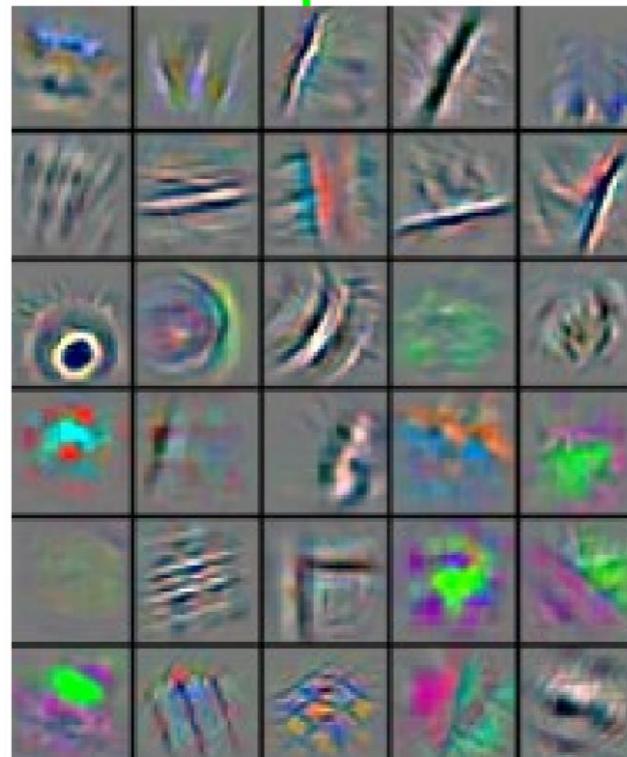
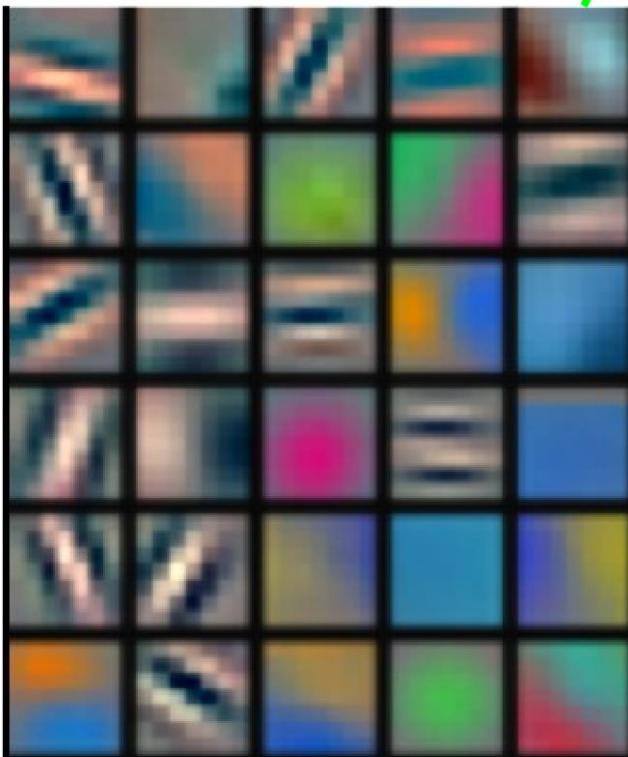
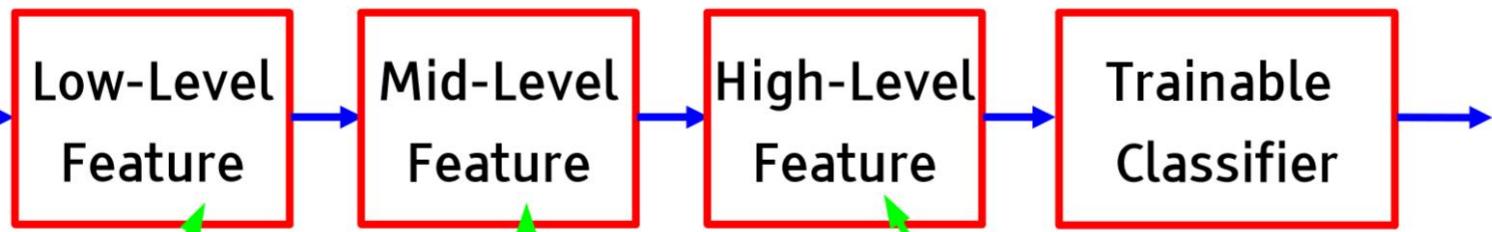
A ton of it!

And having access to large quantities of classified data is vital to the success of a deep learning project.

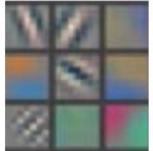
Let's try another
example.

*What is in this
image?*

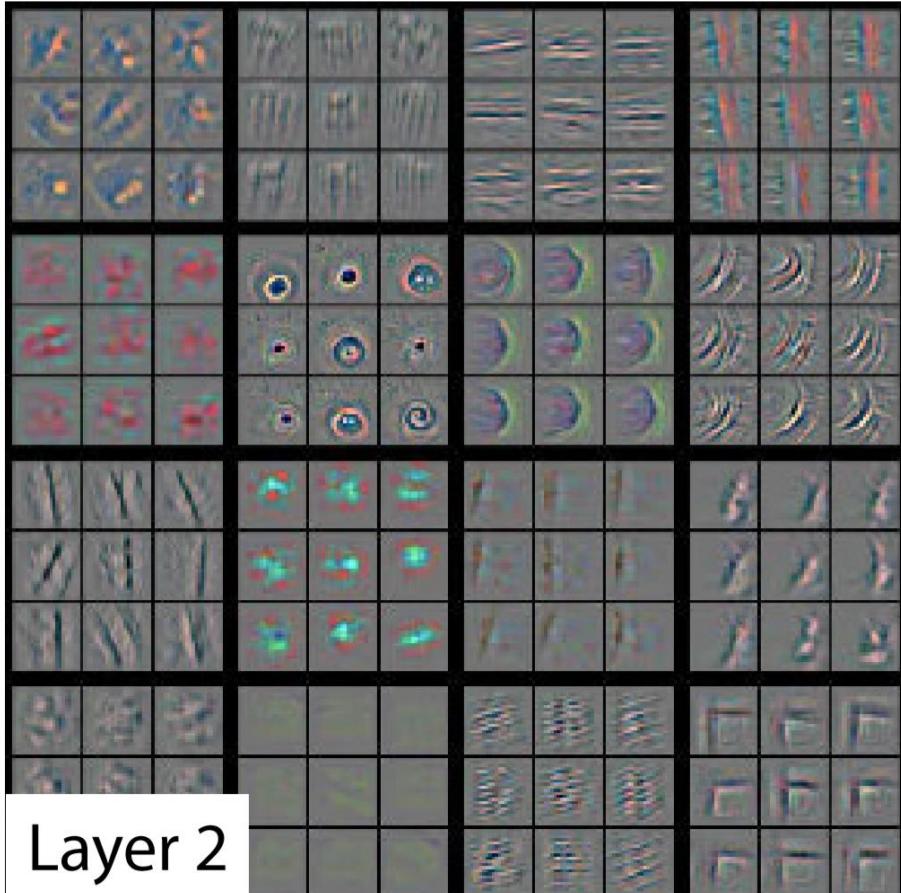
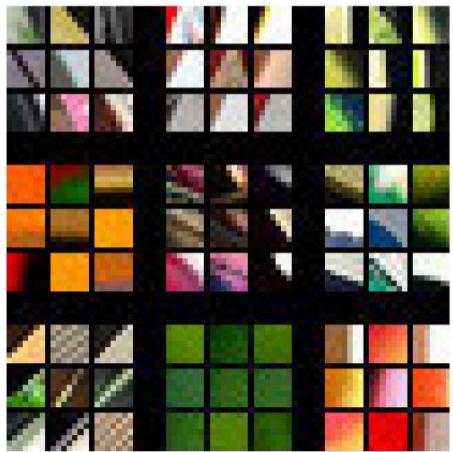




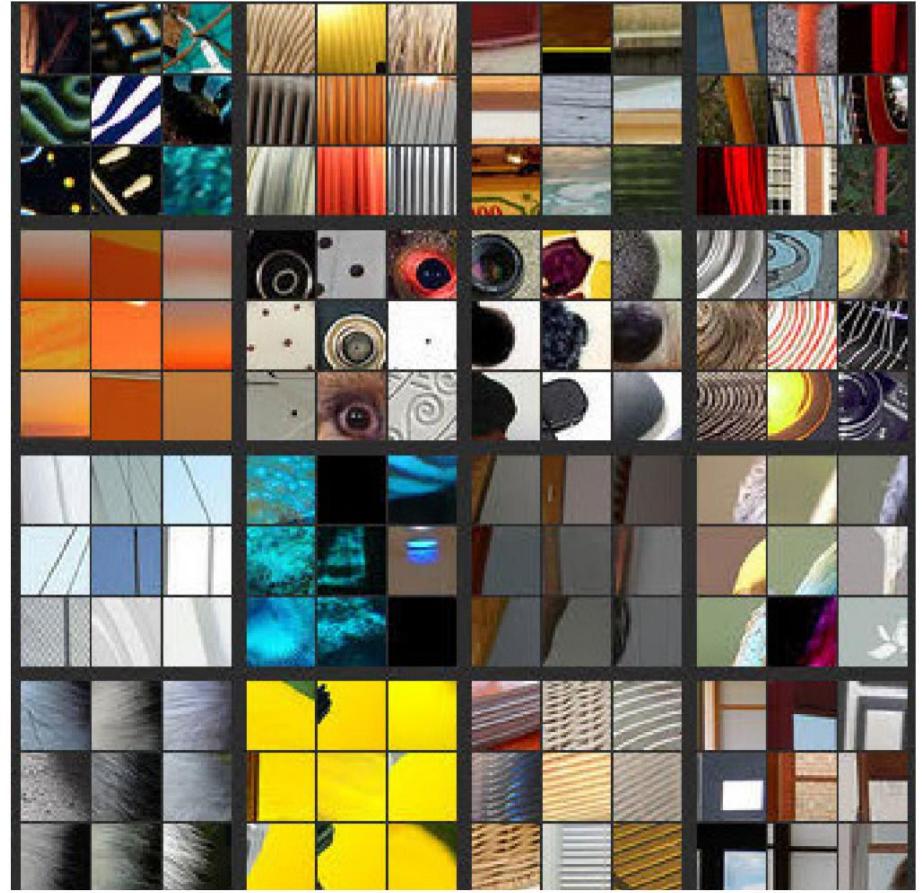
Feature visualization of convolutional net trained on ImageNet from [Zeiler & Fergus 2013]

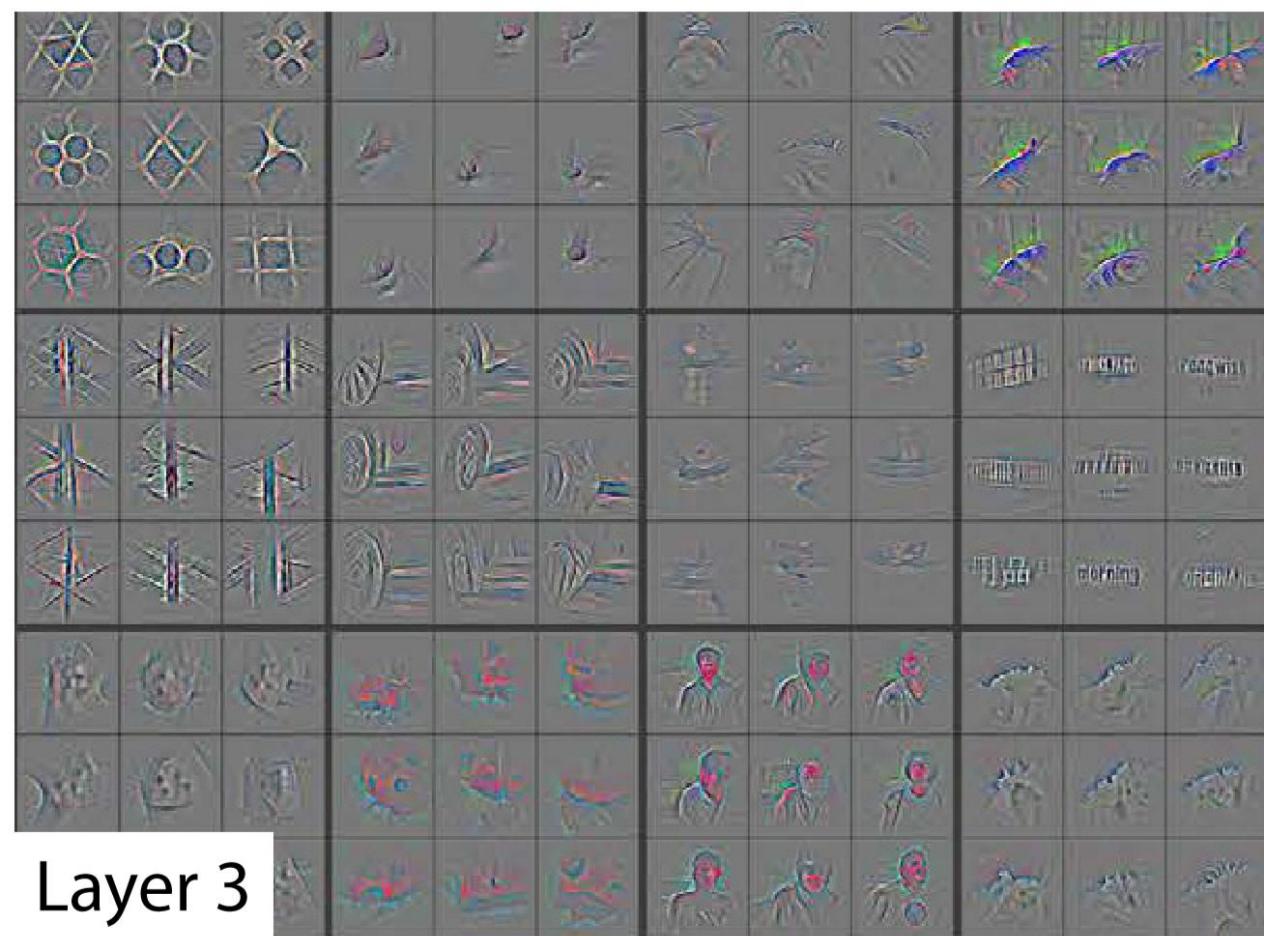


Layer 1



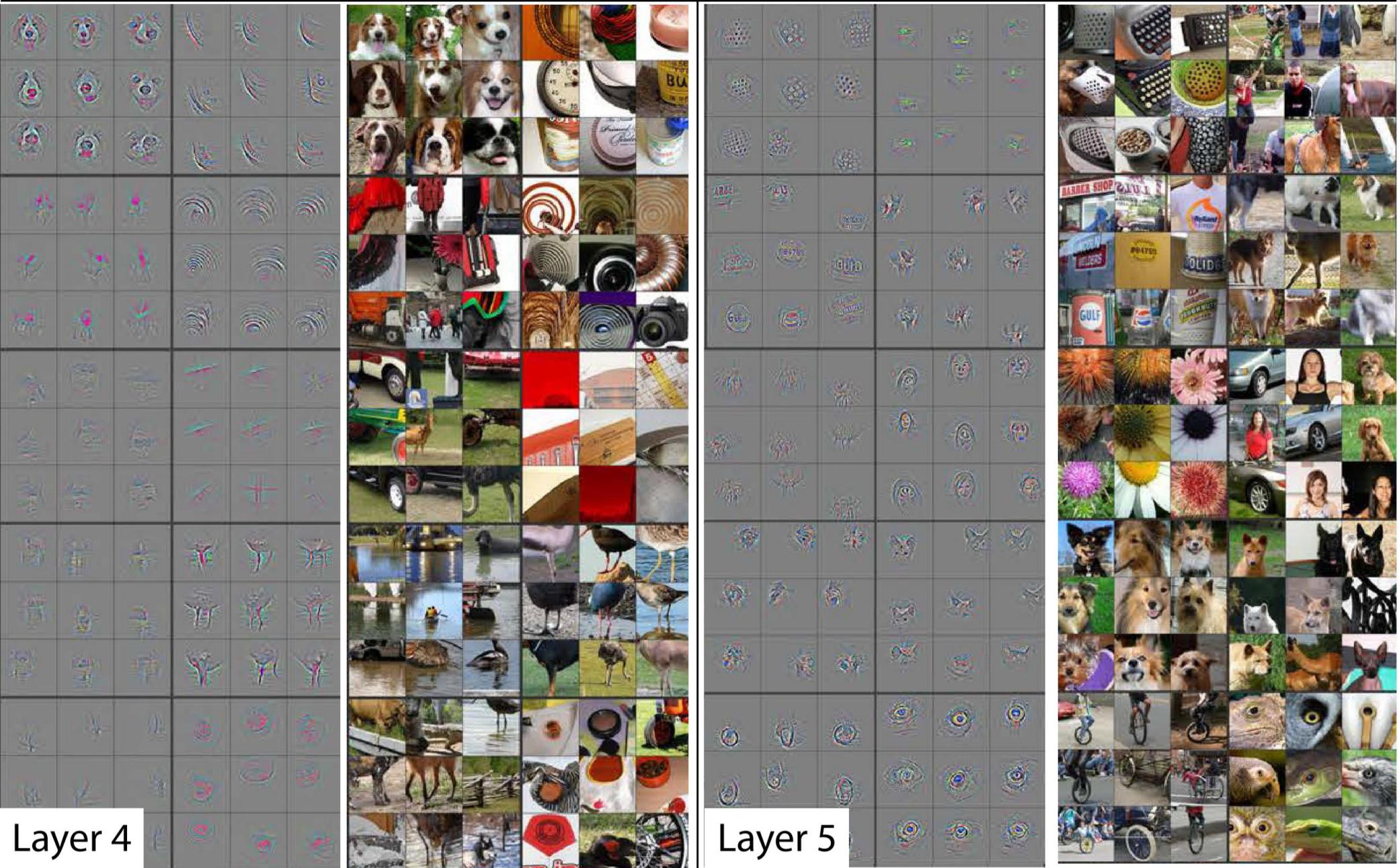
Layer 2

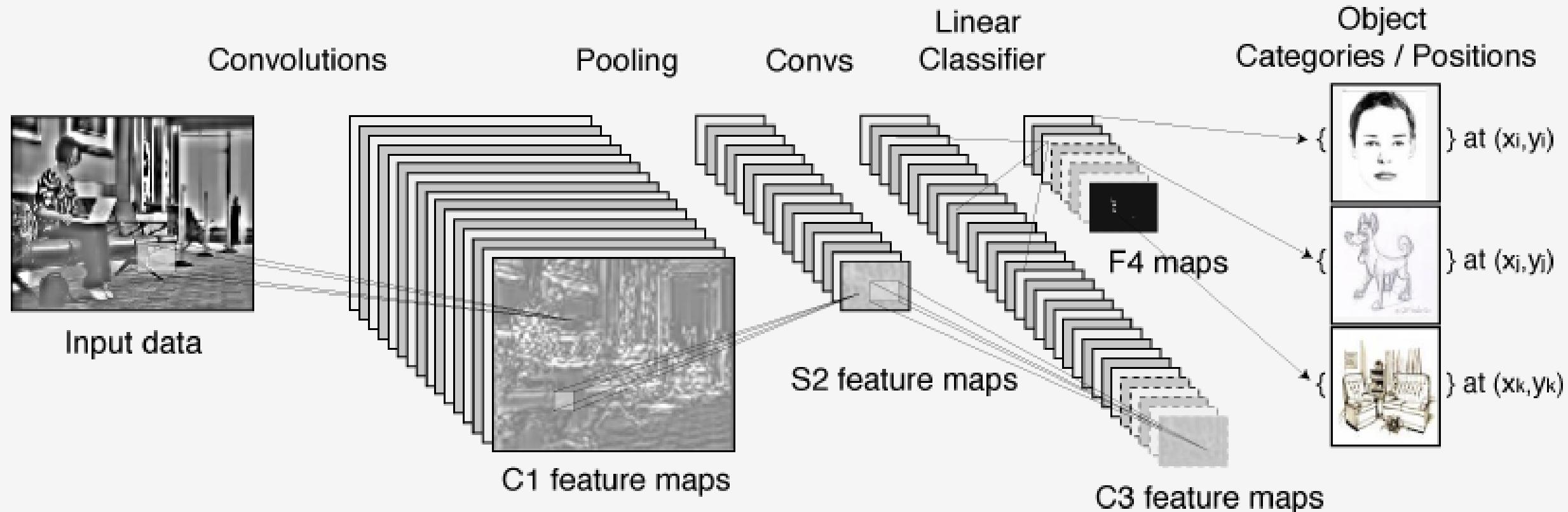




Layer 3

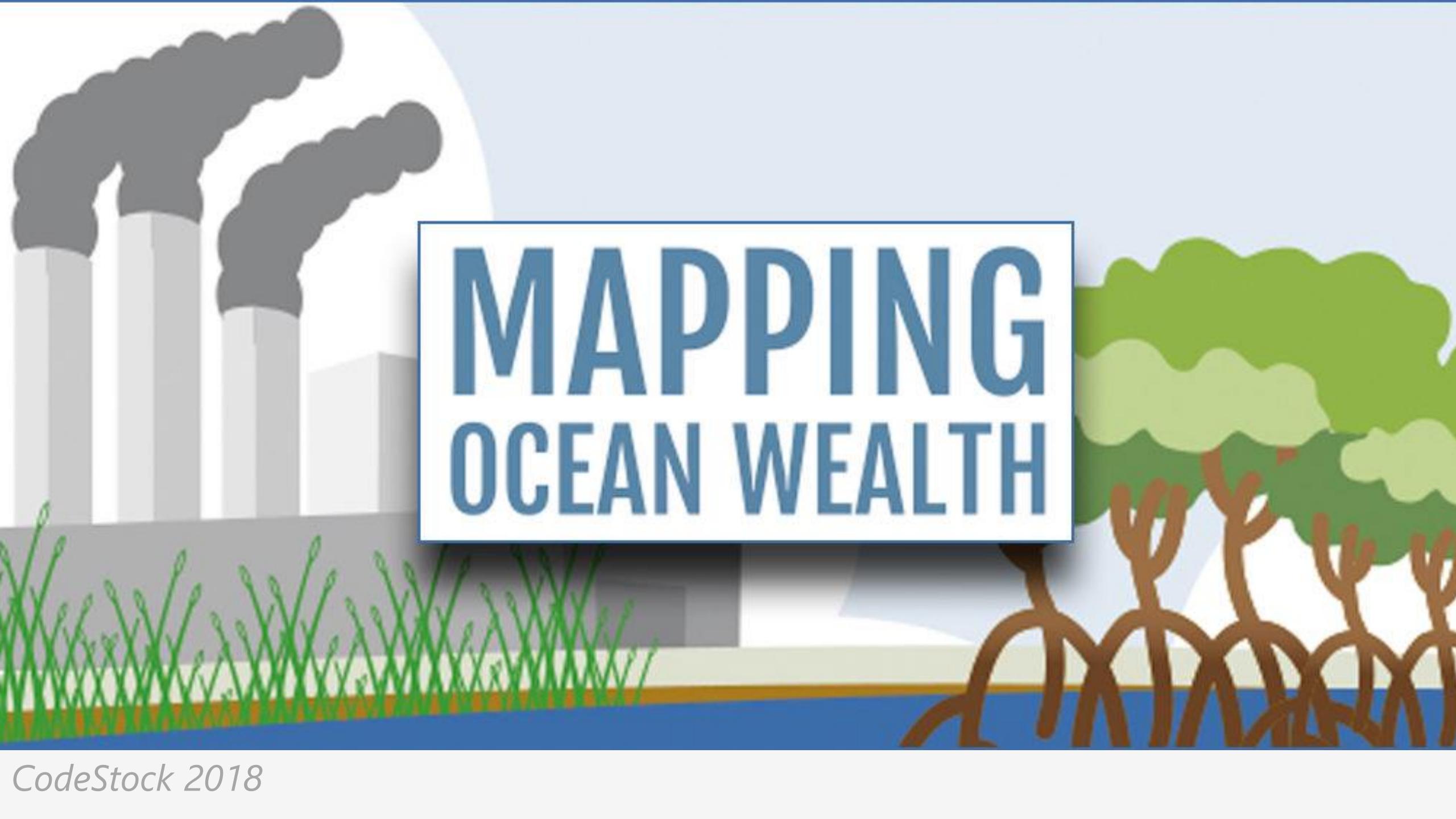






Show me some

Use Cases



MAPPING OCEAN WEALTH

The Nature Conservancy

Detecting Coral Reefs and Scuba Diving Imagery

Background

This proof of concept will be focused on detecting corals, scuba diving equipment, and other reef-related images located in user-defined geospatial locations. We will also explore a potential edge case with skydiving, as colors and gear visually is similar to scuba diving.

First Image: Coral Reef

Our first image is very obviously a photo of a coral reef with wildlife and fish; the keyword `reef` is included in the JSON response that we obtain from Cognitive Services. To extract similar images from your corpus of files, you would first filter by geospatial location and then search for `reef` in Cognitive Services JSON responses.



```
In [7]: # Define the Subscription key for making API calls.  
secret = 'INSERT YOUR API KEY HERE'
```

```
In [14]: # Import required libraries for request headers and json extraction.  
import http.client, urllib.request, urllib.parse, urllib.error, base64, json
```

```
"captions": [  
    {  
        "confidence": 0.266922154795059,  
        "text": "a group of colorful underwater"  
    }  
,  
    "tags": [  
        "nature",  
        "covered",  
        "colorful",  
        "orange",  
        "reef",  
        "lot",  
        "colored",  
        "many",
```

The Nature Conservancy





```
{  
  "confidence": 0.8847015046488436,  
  "text": "a man flying through the air on a cloudy day"  
}
```

Diabetic Retinopathy

642m

ADULTS LIVING
WITH DIABETES

415m

ADULTS LIVING
WITH DIABETES

145m (35%)

HAVE SOME
FORM OF DR

45m (11%)

HAVE VISION-
THREATENING DR

YEAR
2015

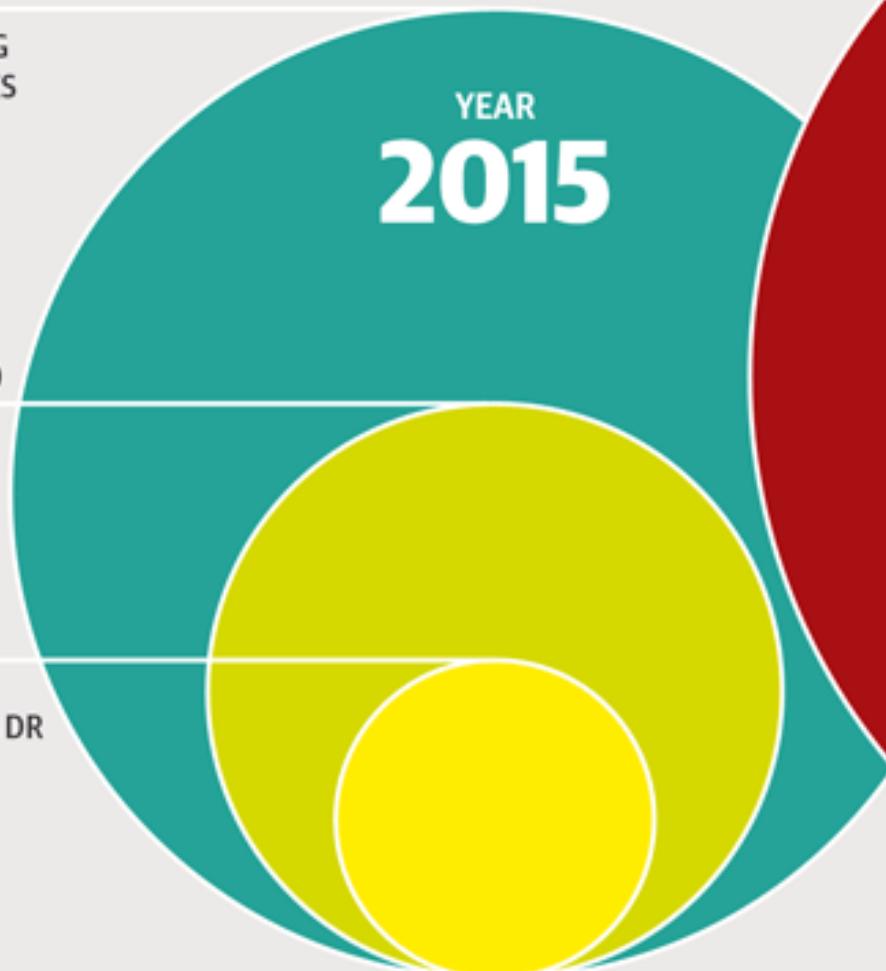
YEAR
2040

(35%) 224m

HAVE SOME
FORM OF DR

(11%) 70m

HAVE VISION-
THREATENING DR



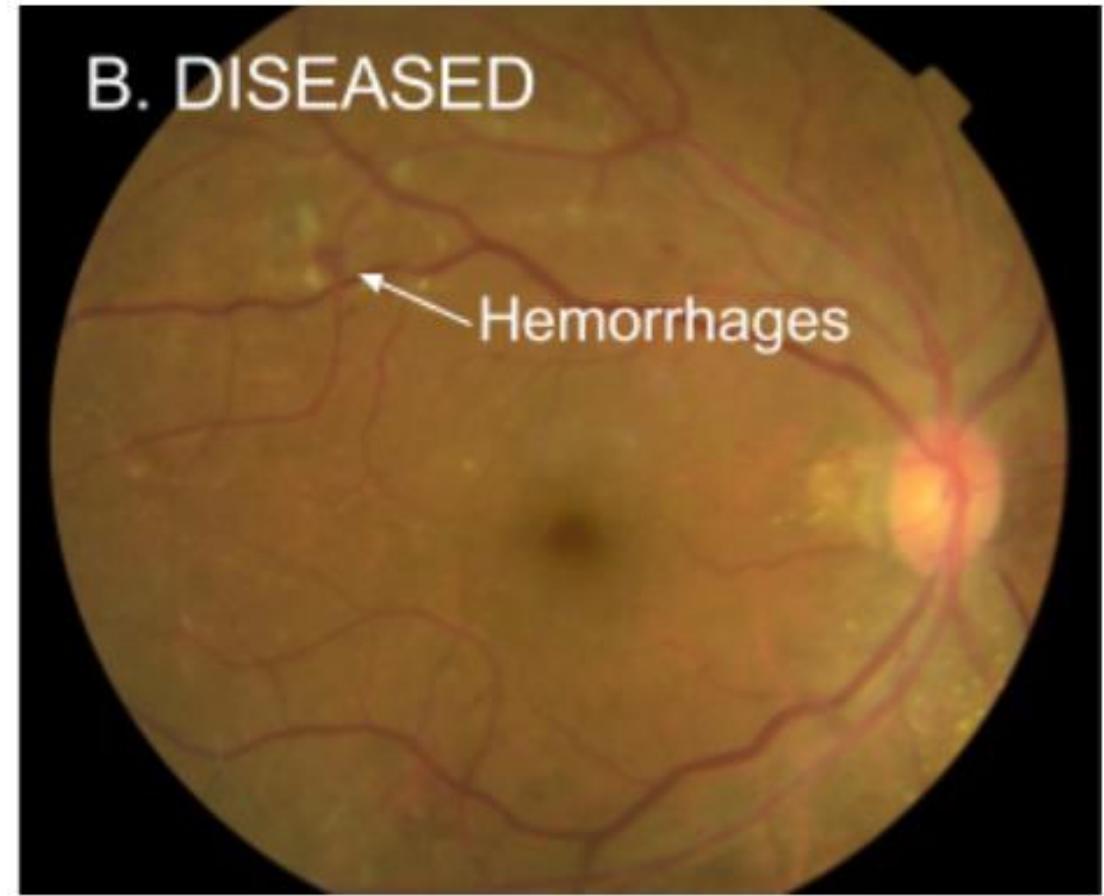
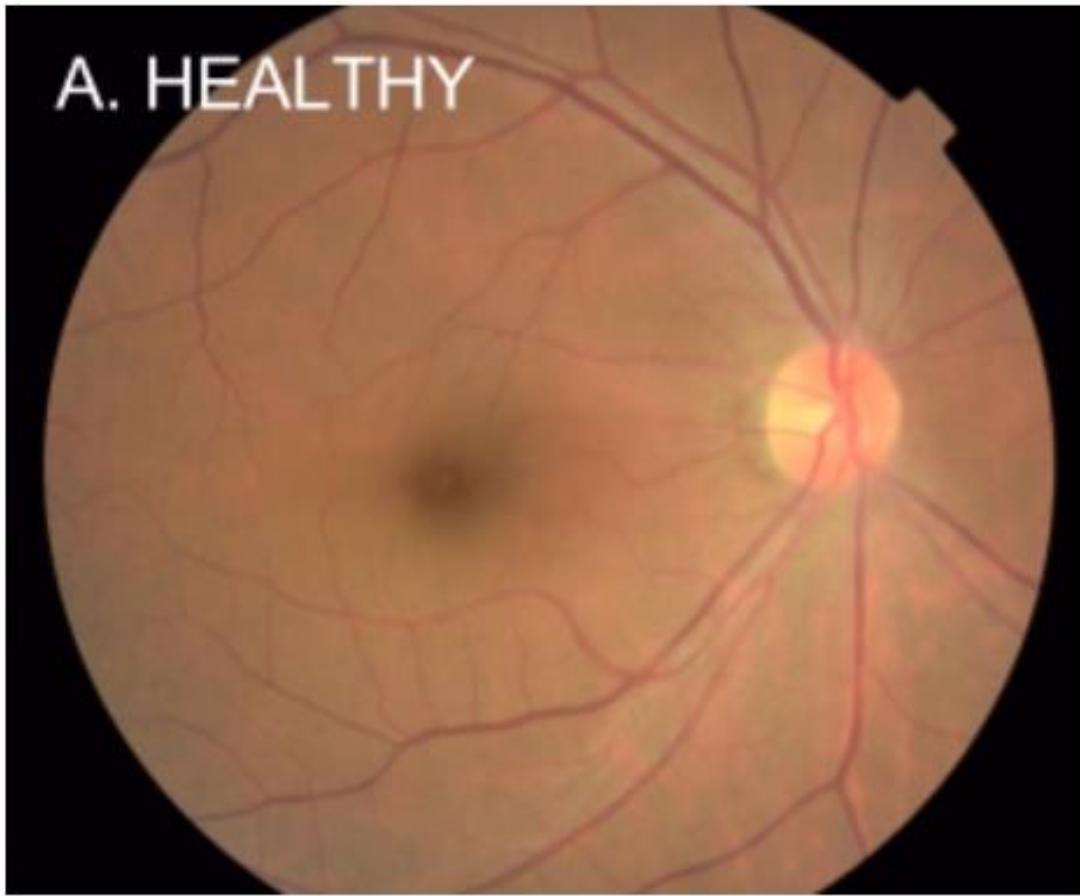
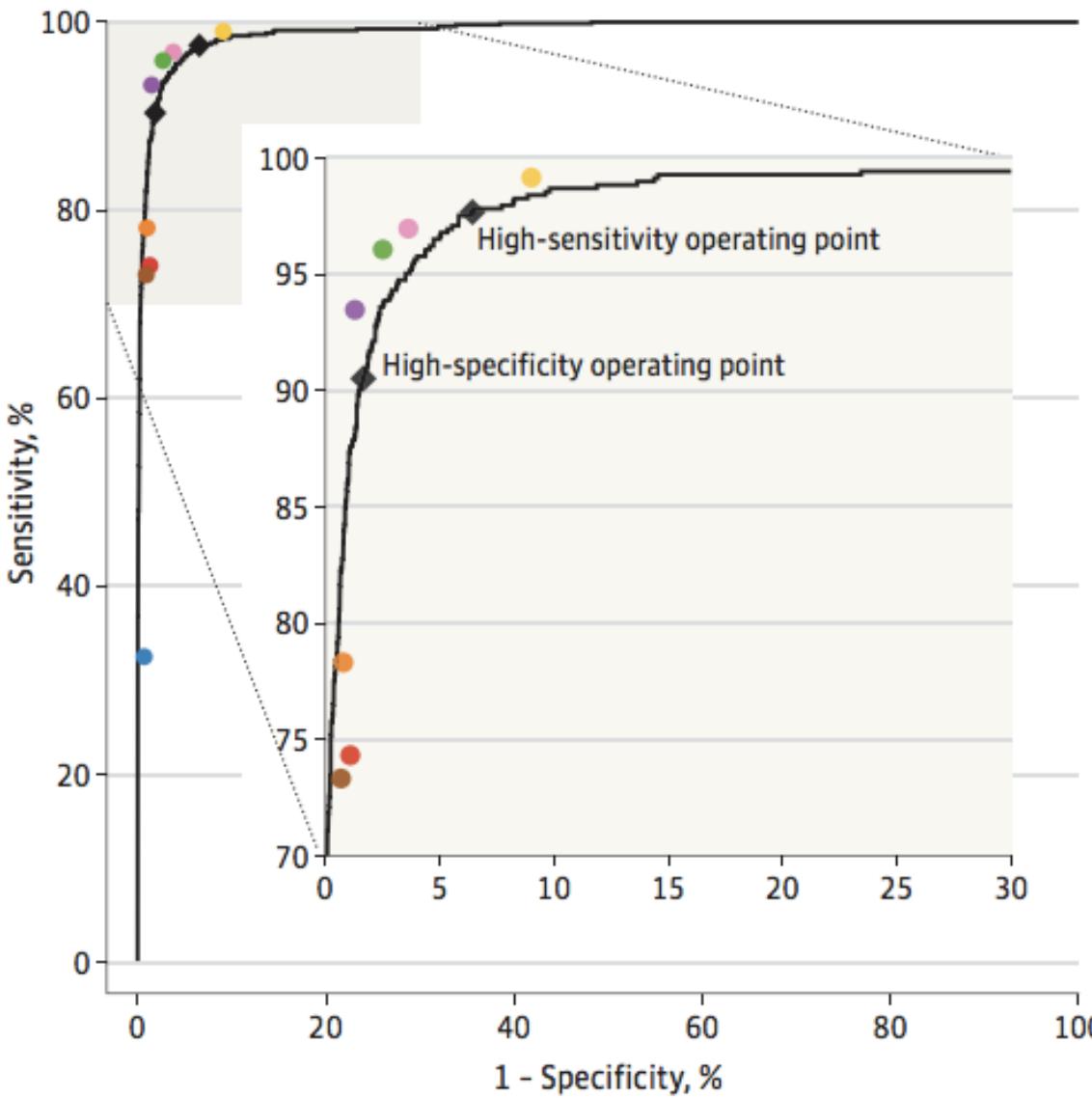


Figure 1. Examples of retinal fundus photographs that are taken to screen for DR. The image on the left is of a healthy retina (A), whereas the image on the right is a retina with referable diabetic retinopathy (B) due to a number of hemorrhages (red spots) present.

 TensorFlow™

A EyePACS-1: AUC, 99.1%; 95% CI, 98.8%-99.3%



Original Investigation | Innovations in Health Care Delivery

FREE

December 13, 2016

Development and Validation of a Deep Learning Algorithm for Detection of Diabetic Retinopathy in Retinal Fundus Photographs

Varun Gulshan, PhD¹; Lily Peng, MD, PhD¹; Marc Coram, PhD¹, et al

» Author Affiliations | Article Information

JAMA. 2016;316(22):2402-2410. doi:10.1001/jama.2016.17216

Editorial Comment

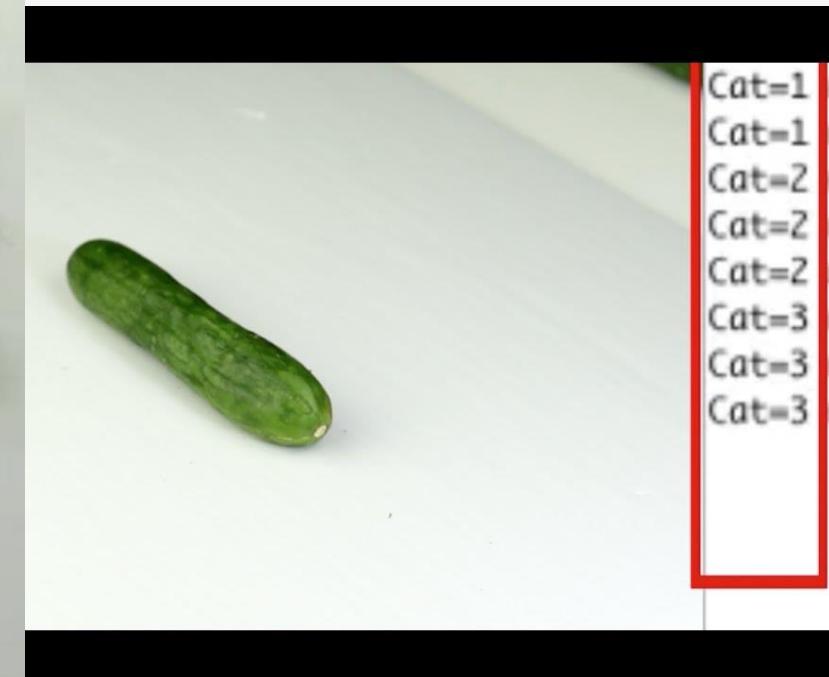
Key Points

Question How does the performance of an automated deep learning algorithm compare with manual grading by ophthalmologists for identifying diabetic retinopathy in retinal fundus photographs?

Finding In 2 validation sets of 9963 images and 1748 images, at the operating point selected for high specificity, the algorithm had 90.3% and 87.0% sensitivity and 98.1% and 98.5% specificity for detecting referable diabetic retinopathy, defined as moderate or worse diabetic retinopathy or referable macular edema by the majority decision of a panel of at least 7 US board-certified ophthalmologists. At the operating point selected for high sensitivity, the algorithm had 97.5% and 96.1% sensitivity and 93.4% and 93.9% specificity in the 2 validation sets.

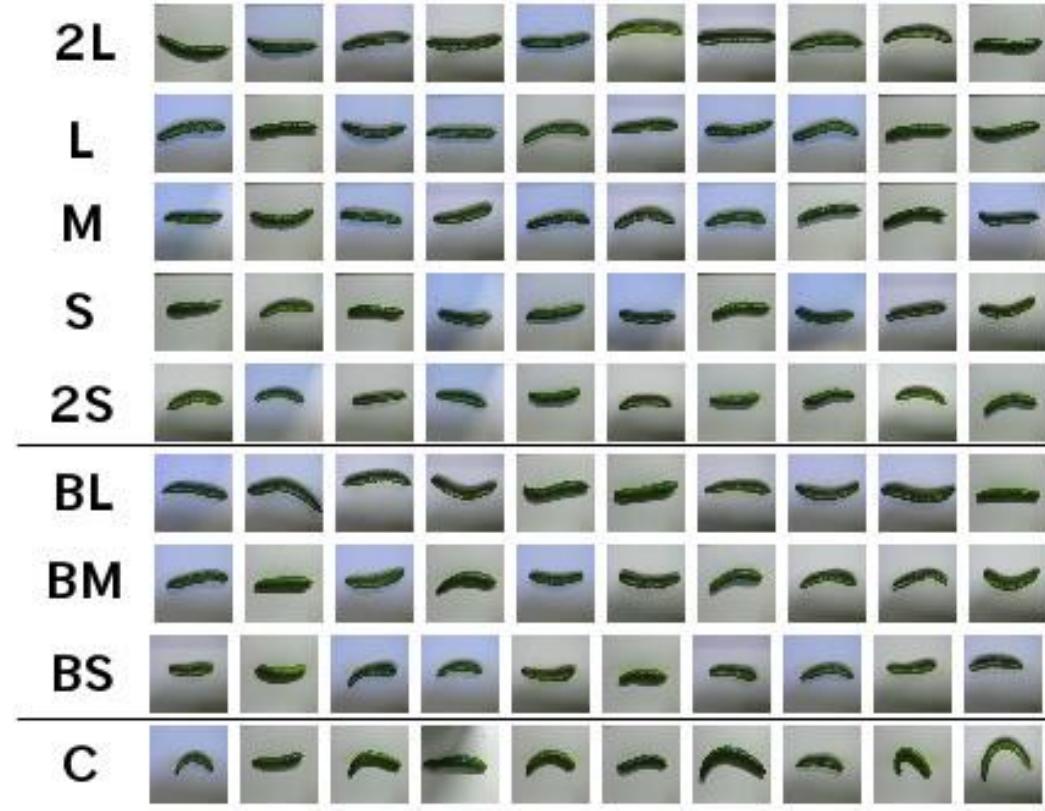






Cat=1
Cat=1
Cat=2
Cat=2
Cat=2
Cat=3
Cat=3
Cat=3







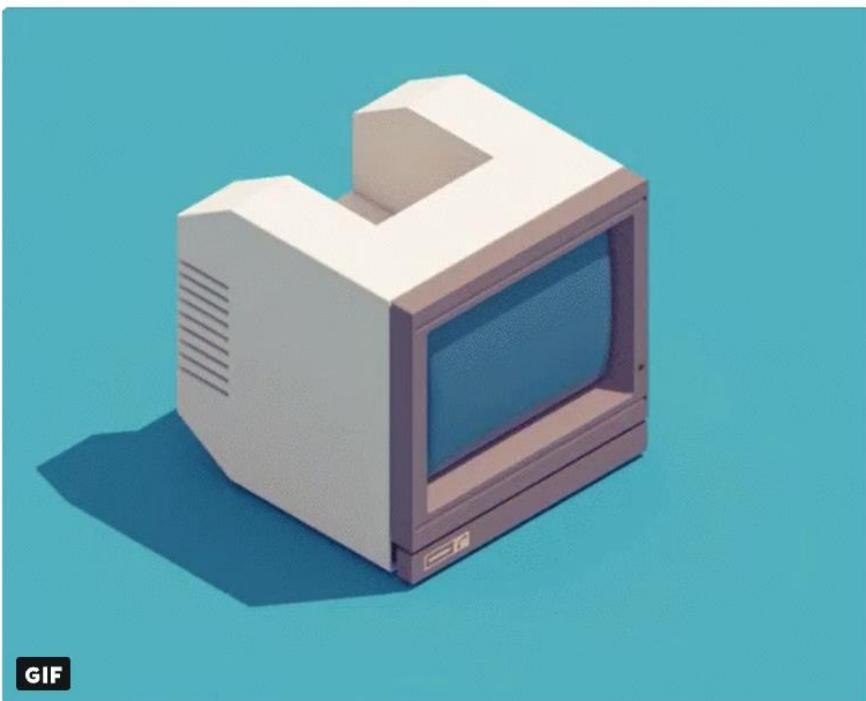
@DynamicWebPaige

@DynamicWebPaige

👏 Raise your hand if you grew up in
the middle of nowhere -

or in a community, home, or
environment where you felt alone -

and computers were your way to create,
to express yourself, to learn and to grow;
a way out.



4:00 PM - 17 Apr 2018 from Bellevue, WA



No matter who you are

who you are

No matter where you are

who you are
No matter **where you work**
where you are

who you are
where you work

No matter **your background**

where you are

who you are
where you work

Your work can have global impact.

your background
where you are

The background of the image is a dramatic, cloudy sky. The clouds are white and grey, with some darker, more turbulent clouds visible at the bottom. The overall mood is mysterious and powerful.

CLOUD PRIVILEGE

http://aka.ms/save_the_world



Thanks!

http://aka.ms/save_the_world

@DynamicWebPaige

Getting Started

“The goal of our efforts is to see governments [and] nonprofits use data to improve what they do,” said DSSG Director Rayid Ghani at the group’s annual conference in Chicago last month. “Data is not going to give them all the answers, but it will help them improve.”

- [Sketch City Harvey API GitHub Repo](#)
- [Code for America](#)
- [Data Science for Social Good Conference](#)
- [SumAll](#)
- [UN Global Pulse Challenges](#)
- [DataKind](#)
- [Social Coder](#)
- [eScience Institute](#)
- [Data4Democracy](#)
- [Apps for Development](#)
- [Random Hacks of Kindness](#)
- [KDD Cup](#)
- [AI for Earth – Climate Data Grant](#)