

Pushing frontiers thru Machine Learning

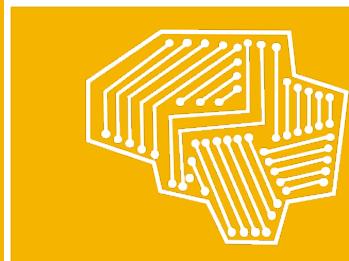
October 10 2016



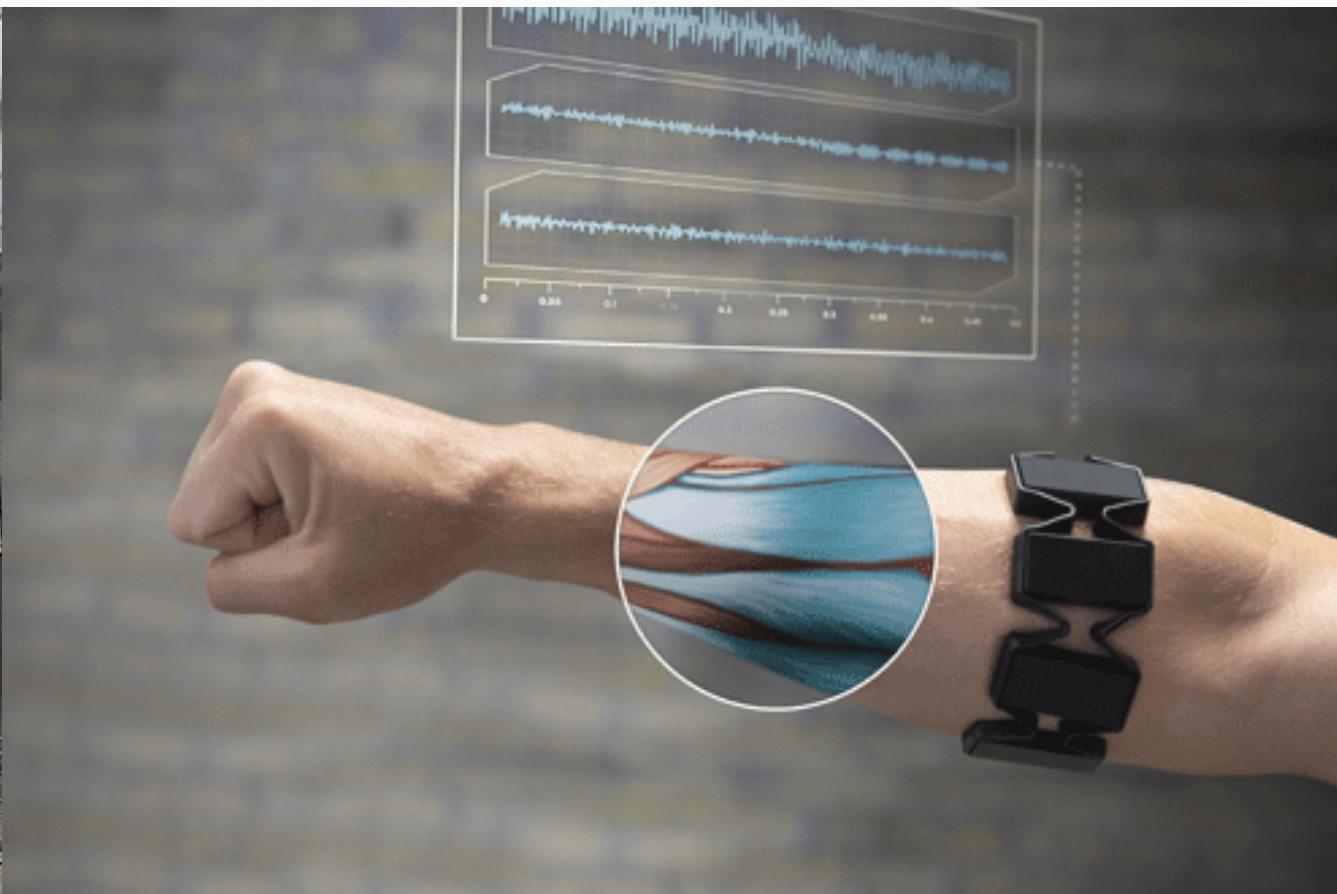
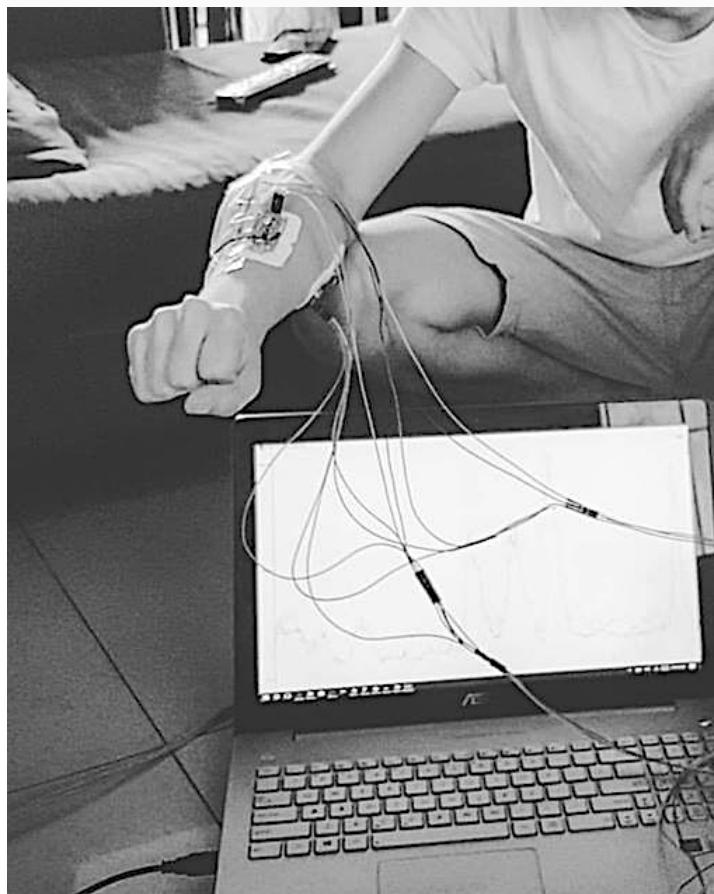


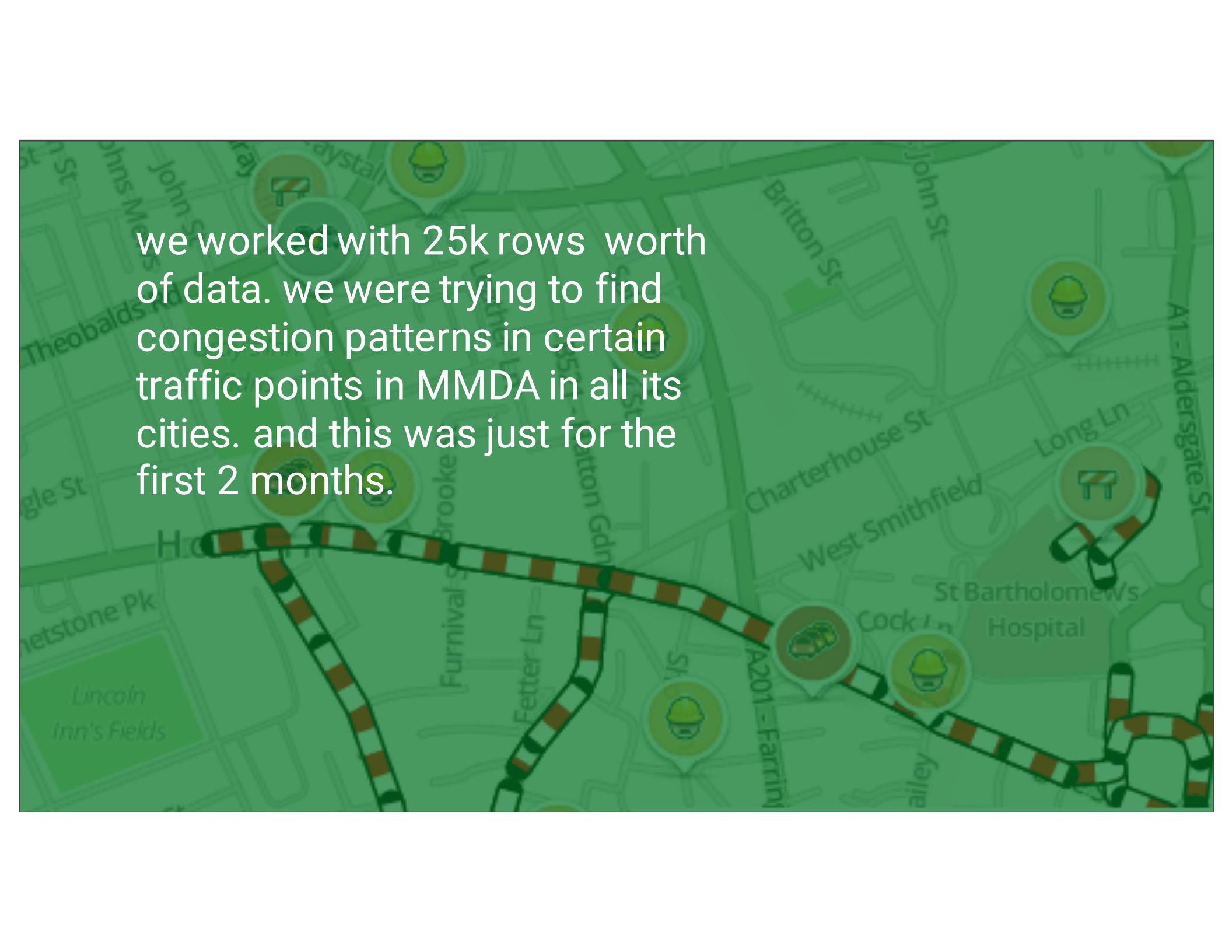
Hi, I'm **Jordan!**

I'm part of a lab where we do research in
machine learning and hci



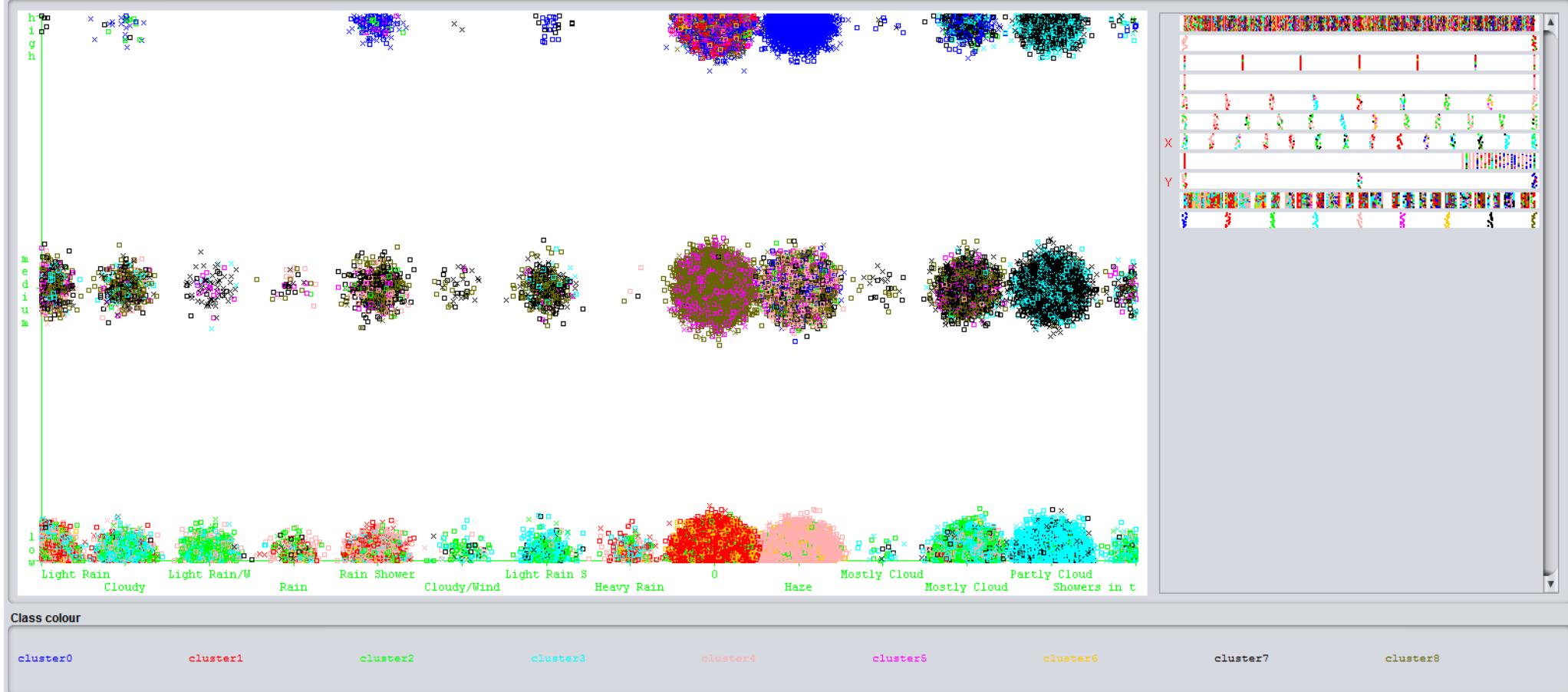
CENTER FOR
COMPLEXITY &
EMERGING
TECHNOLOGIES



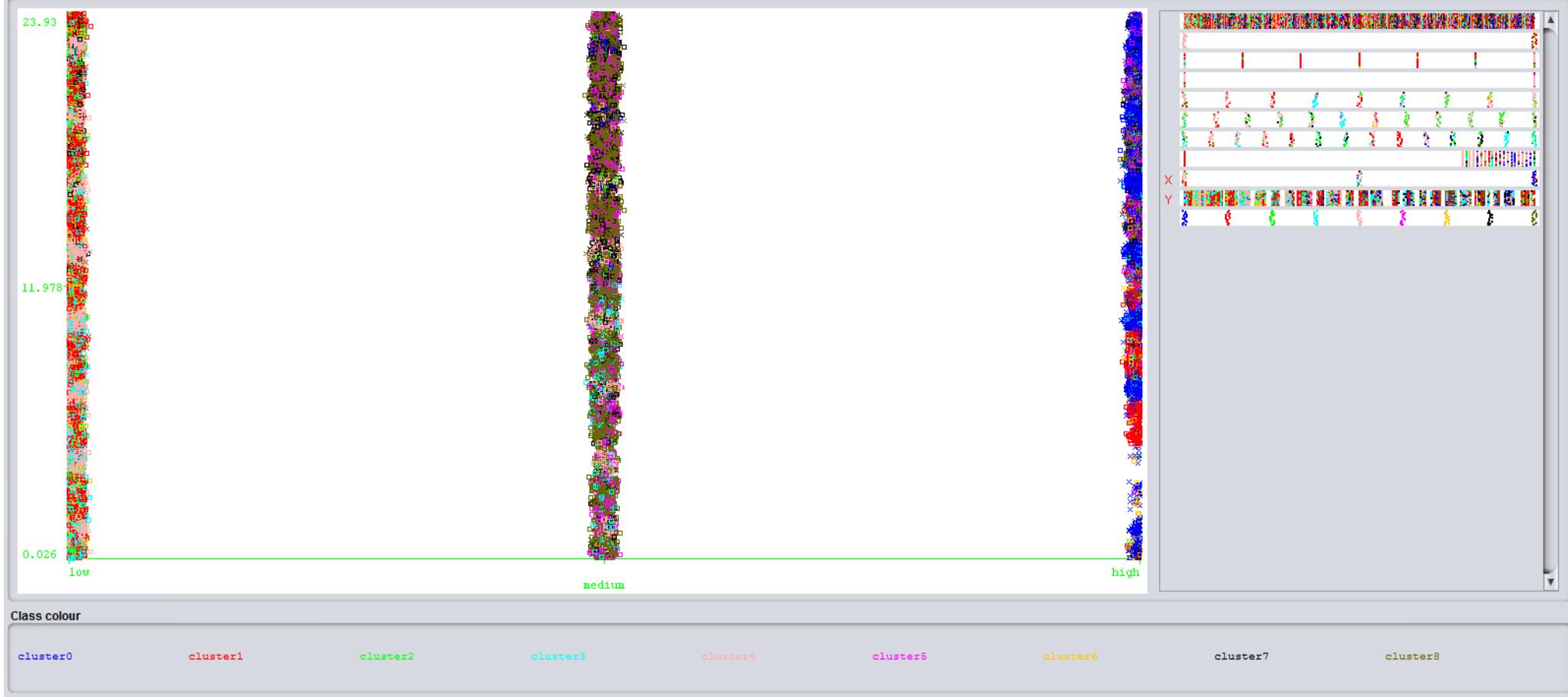


we worked with 25k rows worth of data. we were trying to find congestion patterns in certain traffic points in MMDA in all its cities. and this was just for the first 2 months.

Plot: MASTER-weka.filters.unsupervised.attribute.Remove-R1,4_clustered



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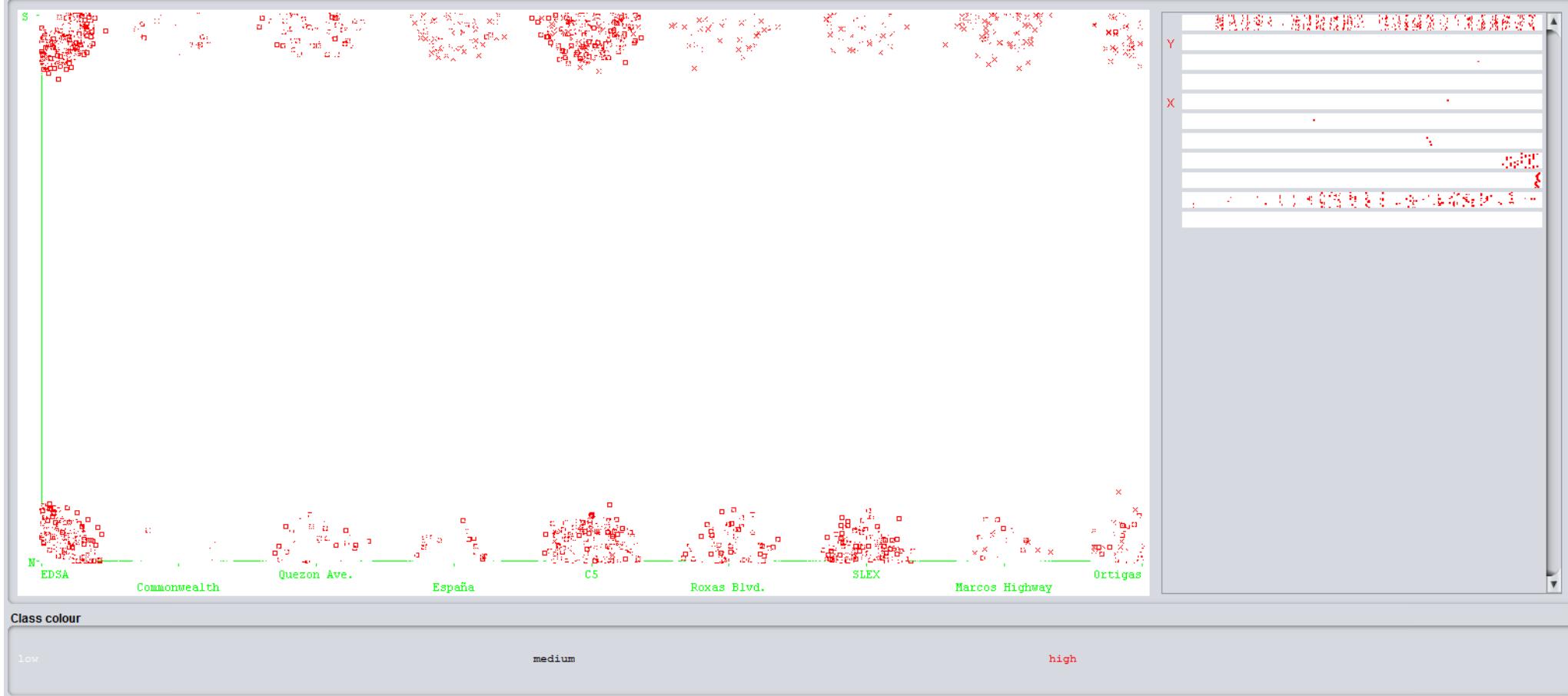


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VISIT ME <http://spark.adobe.com/page/A1gpP/>

Plot: MASTER-weka.filters.unsupervised.attribute.Remove-R1,4_clustered



why talk about Machine Learning?

computer scientists **need** it

Beyond software and data there should be a **model** for it

Machine Learning

Is a subfield of computer science that gives the computers the ability to learn without being explicitly programmed - Arthur Samuel



“ A computer program is said to learn from an experience **E** with respect to some task **T** and some performance measure **P** , If its performance on T as measured by P , improves by some experience E.

- Tom Mitchell



where has
Machine Learning
been applied?

1994

ALVINN

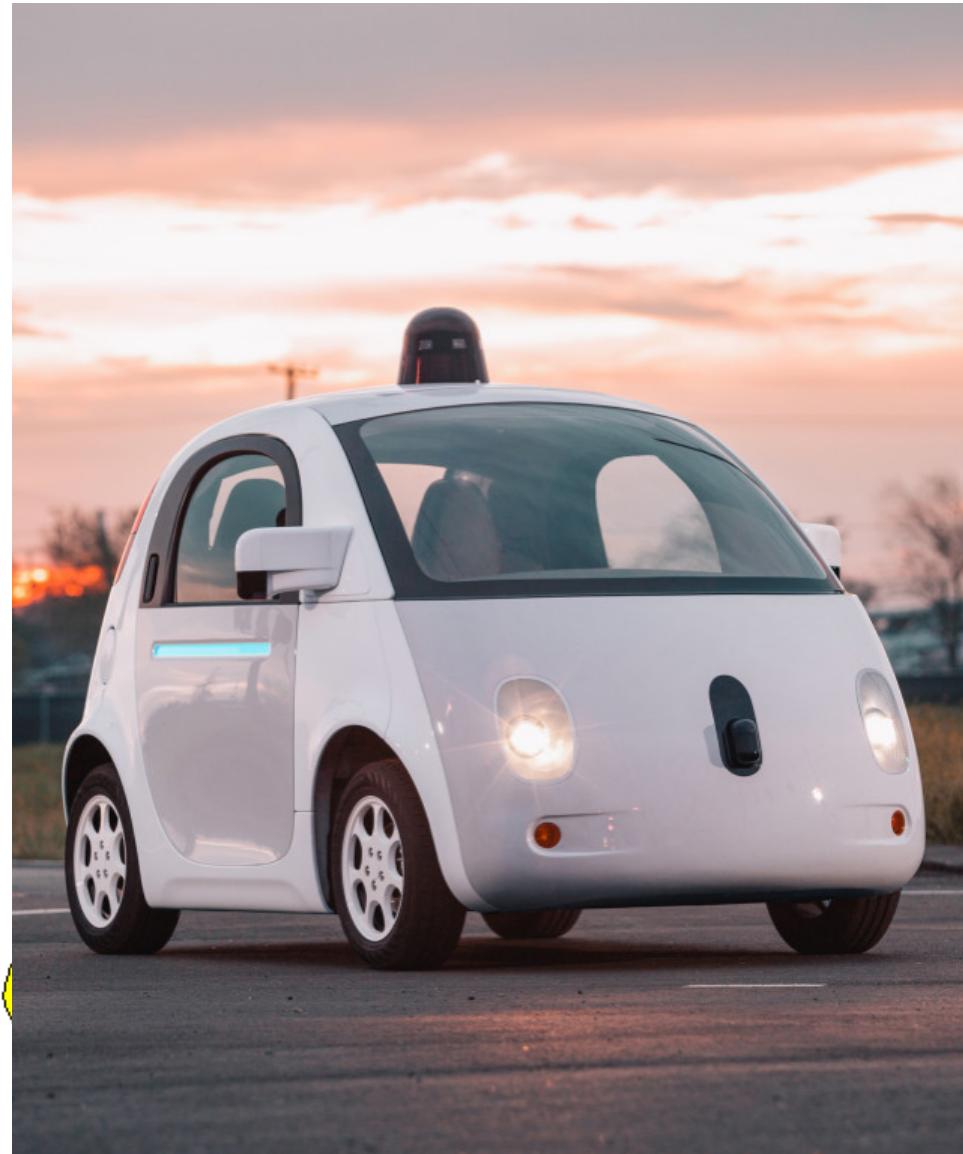
- Automated Land Vehicle with Neural Network
- First vehicle to cross the US Coast in 6 days totally unmanned



2016

Google Self Driving Car

- Integrates cloud, gps and video and image processing



1997

Deep Blue

Deep Blue II defeated
Gary Kasparov,
long time Chess
Grandmaster

May 11th, 1997

Computer won world champion of chess

(Deep Blue)

(Garry Kasparov)



(Reuters = Kyodo News)

2016

Google DeepMind wins Alpha Go

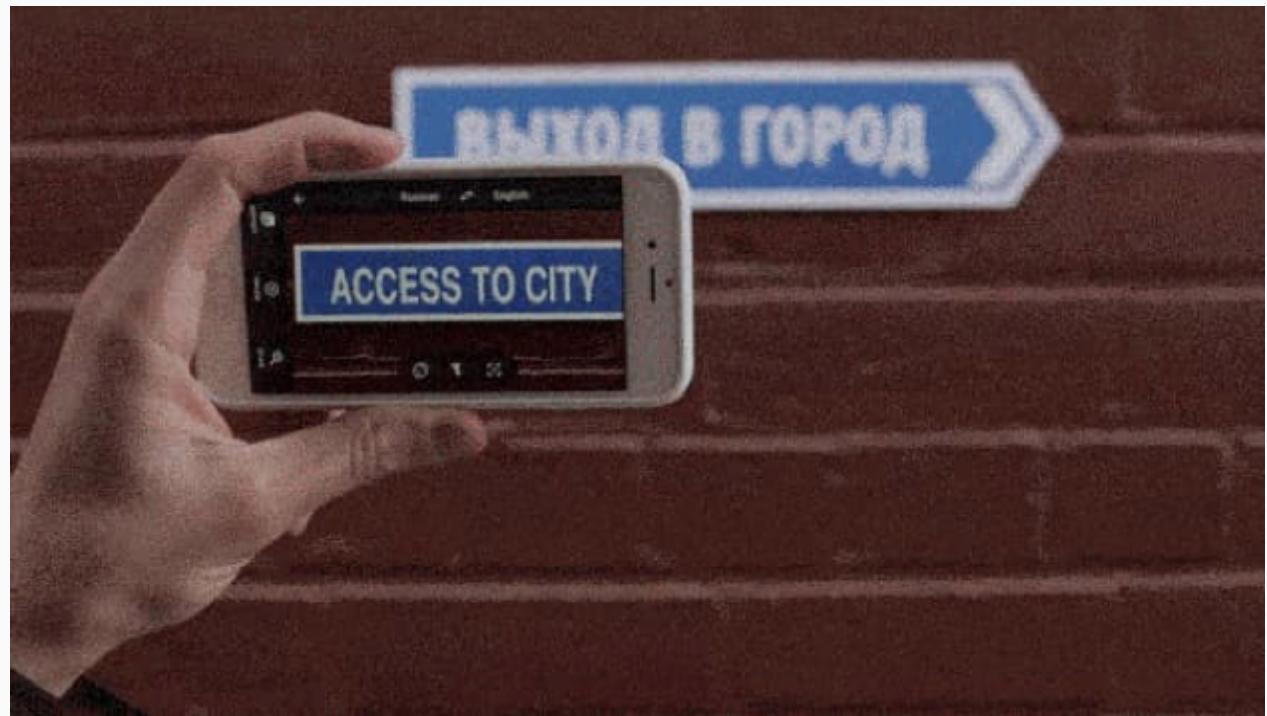


so now we ask..

how can computer
scientists make
use of machine
learning?

On images translation

Instantly translate
foreign words into
your preferred
language



On surveying “drones”

Like the ADARNA project for aerial surveying, remote navigation and monitoring



The ADARNA Project
Computer Technology Department
College of Computer Studies
De La Salle University

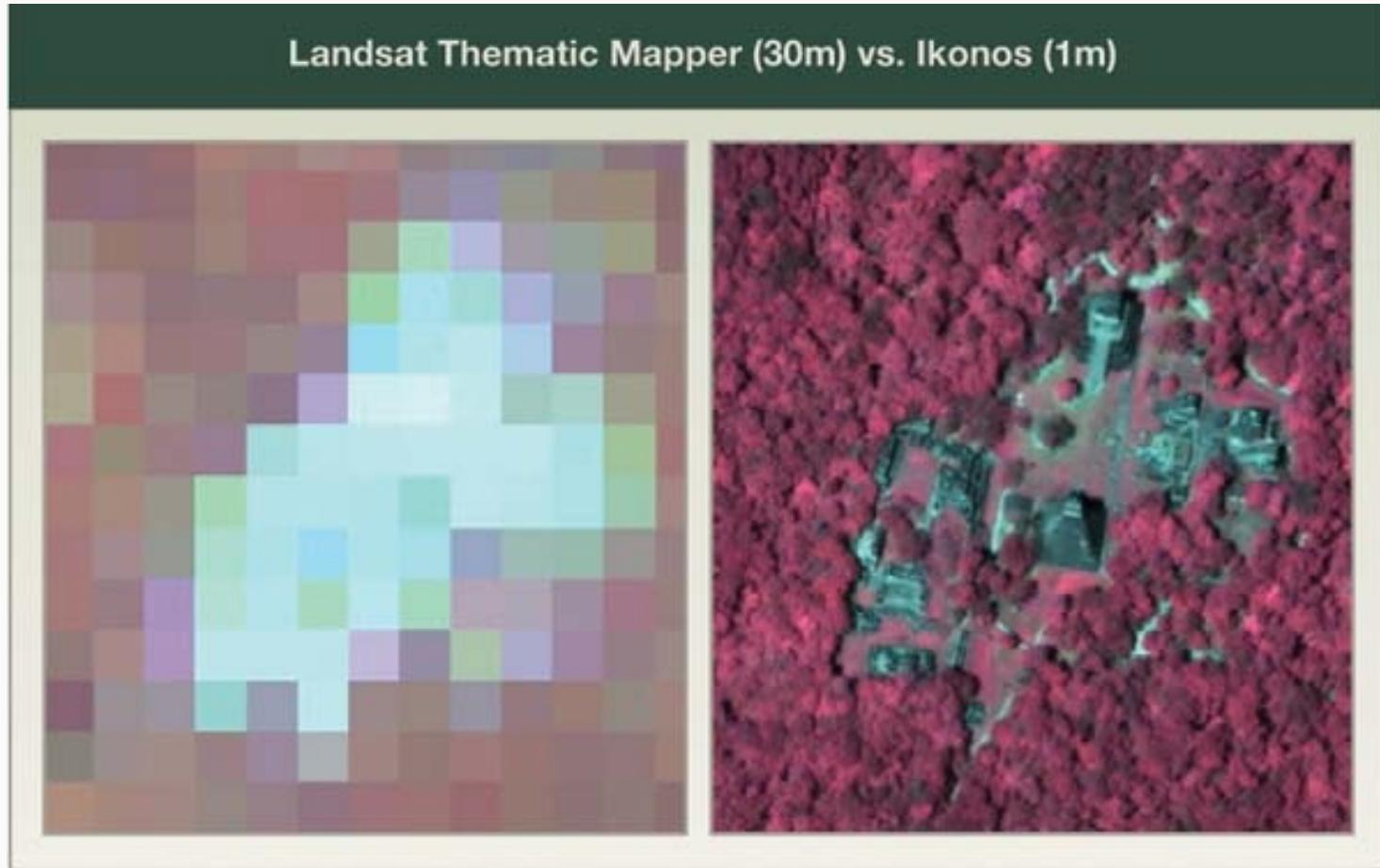
Or better yet

Sky-catch drones



See what NASA did

Used Satellites to find Mayan ruins



Remember the PH satellite?

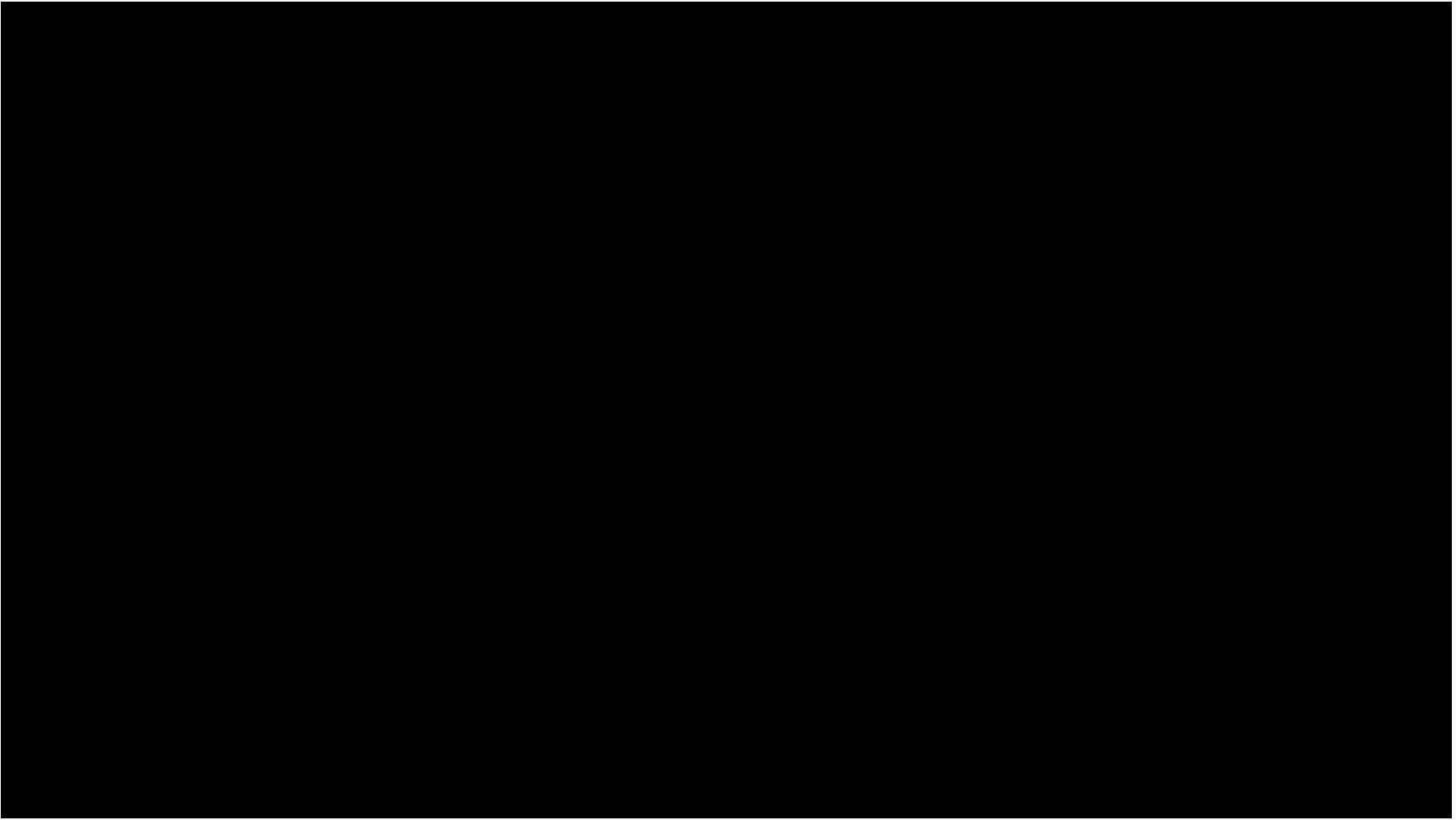
Diwata?



Processing:

Machine learning can enable us to integrate **technologies** with **intelligent code** so we can try out new “interactions”

check out Myo



A man with a mustache and glasses is shown from the chest up. He is wearing a dark blue polo shirt with a yellow logo on the left chest. A Myo armband is attached to his right forearm. A robotic arm is attached to his hand, and it is pointing upwards. The background is blurred, showing some white lights.

Myo has been integrated
with prosthetic arms
to allow smoother control



“Em sense” senses thru touch an items electromagnetic waves and provides a suggestion on how to use that object

EM-Sense

Touch Recognition of Uninstrumented,
Electrical and Electromechanical Objects

Gierad Laput
Alanson Sample

Chouchang Yang
Chris Harrison

Robert Xiao

Carnegie
Mellon
University

 Disney Research

A man with a shaved head and a goatee is lying on his back on a bed. He is wearing a light-colored, ribbed shirt. His hands are clasped behind his head, and he is looking upwards with a contemplative or thoughtful expression. The background is a plain, light-colored wall.

think of it:

There are jobs now that **did**
not exist 5 years ago

Machine Learning

Empowered jobs

**Augmented Reality
designer**

**Artificial Personality
Designer**

Analytics managers

**Embodied Conversational
Agents**

Data Scientist, Engineers

reflection:
but Machine Learning still has
a long way to go

our brains are so complex they're
too difficult to understand. but
they're powerful like that.



www.shutterstock.com - 325209851

playground.tensorflow.org

Speed Dial Technology Games News Shopping Sports Local Travel Business Entertainment International Gr... Deja-PCSC201... Nine Powerful...

Tinker With a Neural Network Right Here in Your Browser.

Don't Worry, You Can't Break It. We Promise.



Iterations
000,000

Learning rate
0.03

Activation
Tanh

Regularization
None

Regularization rate
0

Problem type
Classification

DATA

Which dataset do you want to use?



Ratio of training to test data: 50%



Noise: 0

FEATURES

Which properties do you want to feed in?

x_1 , x_2 , x_1^2

+ - 2 HIDDEN LAYERS



4 neurons

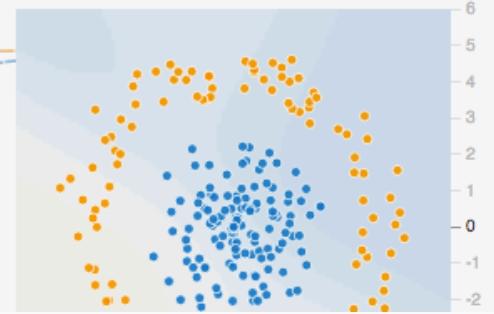


2 neurons

The outputs are mixed with varying weights, shown

OUTPUT

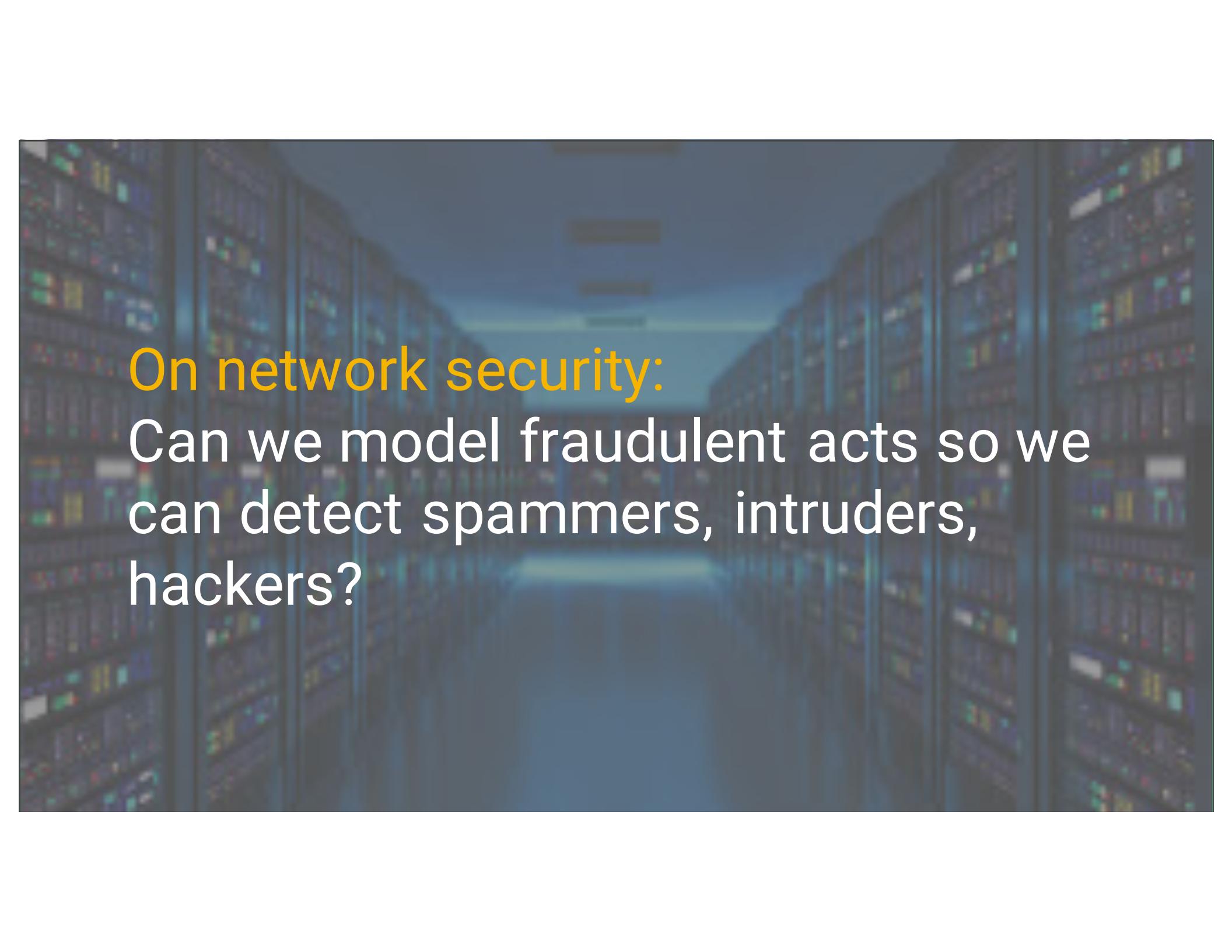
Test loss 0.500
Training loss 0.500



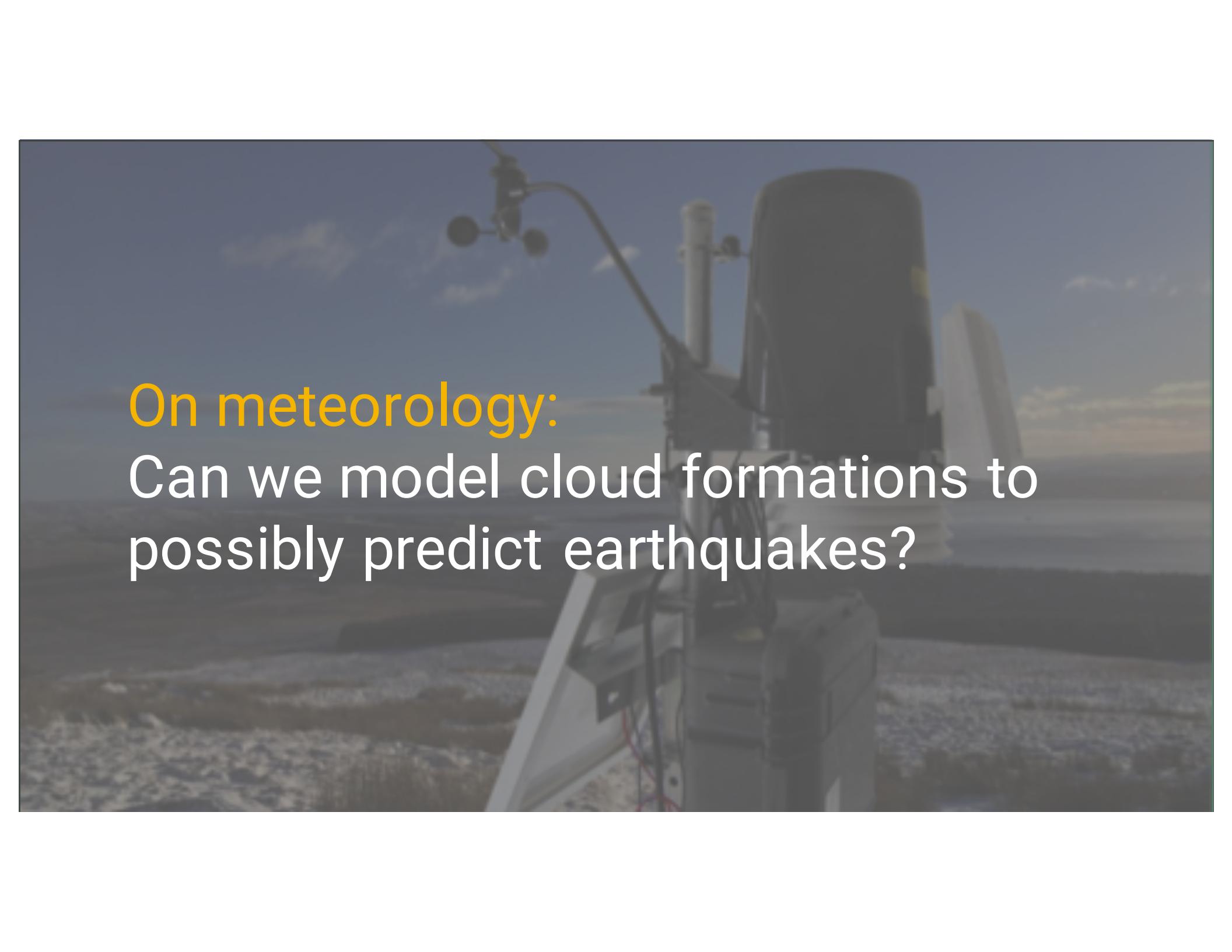
A photograph of a banana plantation. The foreground and background are filled with tall, green banana plants. Their long, slender leaves have prominent veins and some show signs of aging or damage. The plants are closely packed, creating a textured, vertical pattern.

On agriculture

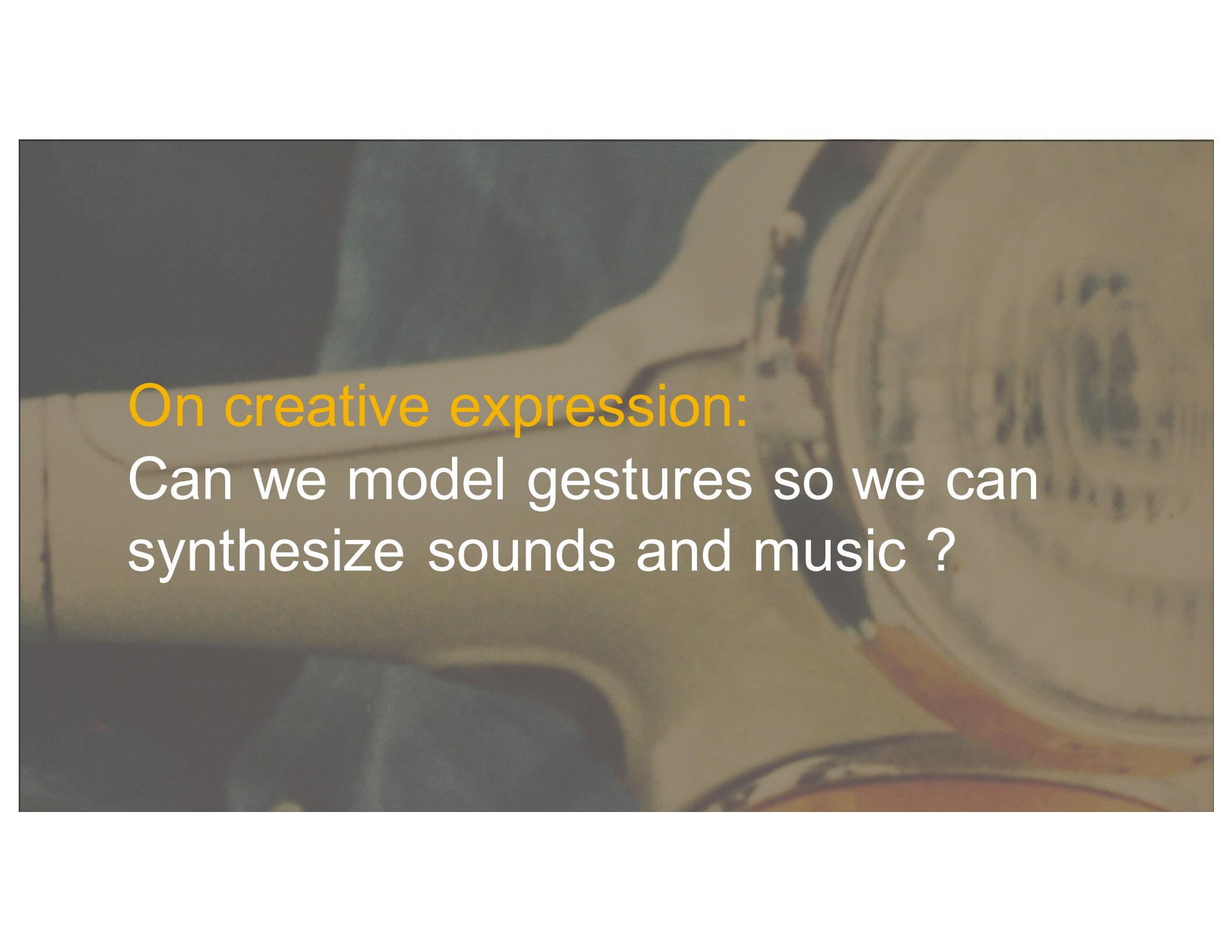
Can we build a setup where we can monitor (and possibly prevent) the early spread of fungi in banana farms?

The background of the slide is a blurred photograph of a data center. It shows several rows of server racks filled with computer hardware. The lights from the equipment create a colorful, glowing effect against the dark, metallic surfaces of the racks.

On network security:
Can we model fraudulent acts so we
can detect spammers, intruders,
hackers?

A photograph of a weather station mast standing in a field. The mast is dark grey and has several components attached: a wind vane and anemometer at the top, followed by a vertical pipe, and a large cylindrical sensor or antenna below that. The background shows a hilly landscape under a blue sky with scattered white clouds.

On meteorology:
Can we model cloud formations to
possibly predict earthquakes?

A close-up, slightly blurred photograph of a person's hand and forearm. The hand is resting on the neck of a guitar, with fingers partially visible. The background is dark and out of focus.

On creative expression:
Can we model gestures so we can
synthesize sounds and music ?

Planes dont flap their wings to fly, but birds
dont take off from trees either.

A car can run faster than a cheetah, but it
can never climb a tree.

Thank you for listening!

For your questions, partnerships and other concerns you may contact me via:

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@jordandoinwork

