







WE LIVE OUR LIVES INCREASINGLY ONLINE





WE LIVE OUR LIVES INCREASINGLY ONLINE



Sex: 100% male  
More about me

# Lingo

- 0:-) Angelic
- :-{ Delicious/Yummy
- :-9 Blowing a kiss
- ;-> Develish Wink
- (((name))) Hug
- (( )):\*\* Hugs and kisses
- \*\*\*\* Popcorn
- &&&& Pretzels
- @>^`-\_- Rose
- {^:= My fave smiley

# HELLO LADIES

Let me tell you my hobbies

*I like to play chess, and chat with ladies on the internet.*


LOVE

- Visit Flame's Bedroom -









 Search

DISCOVER

 Featured

 Music

 Videos

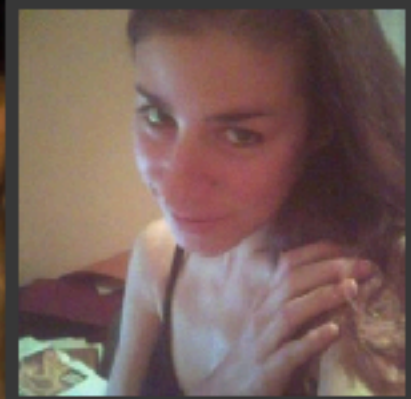
 People

[Sign up](#)

[Sign in](#)

[Help](#) • [Site Info](#)

[Privacy](#) • [Terms](#)



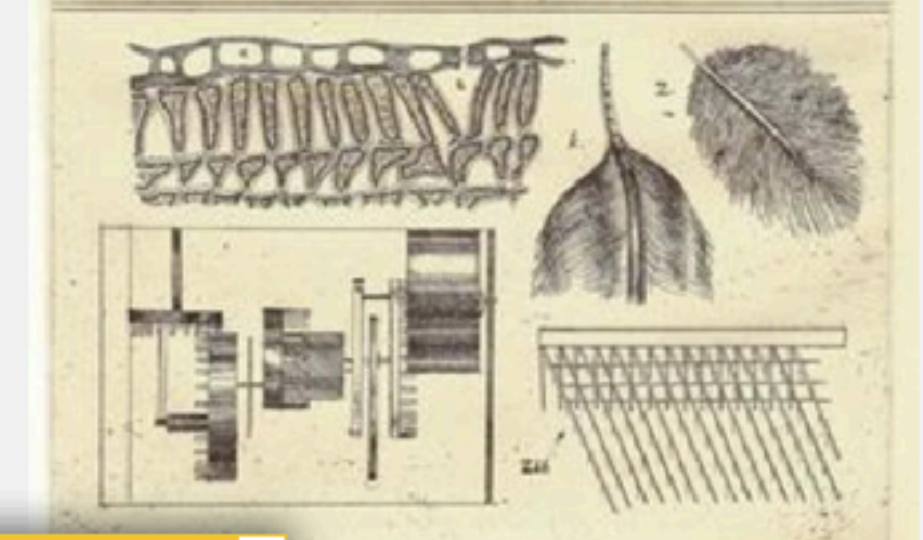
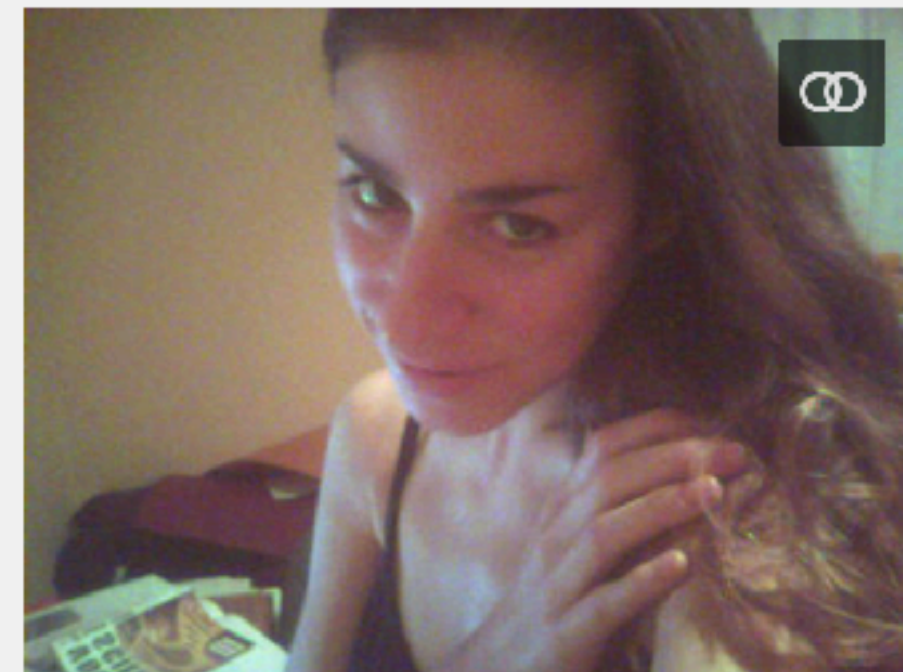
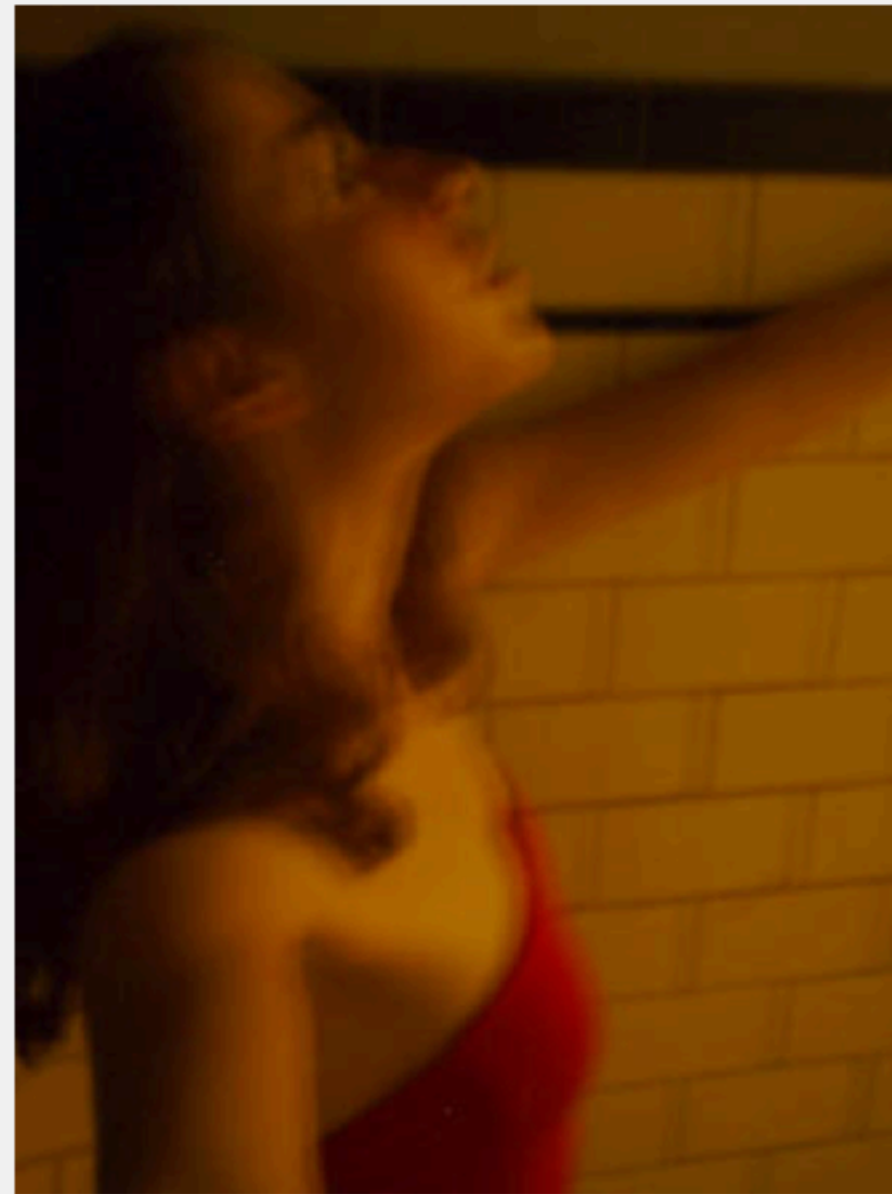
sarah drasner

Photos

Connections

Mixes

[Post Photo](#)













BUT THE ONLY  
CONSTANT IS CHANGE.





CONSUMENTENBOND - ENERGIE VERGELIJKER



“People are using search engines rather than libraries or teachers to make sense of the world we’re inhabiting.”

–SAFIA NOBLE, PHD,  
AUTHOR OF ALGORITHMS OF OPPRESSION

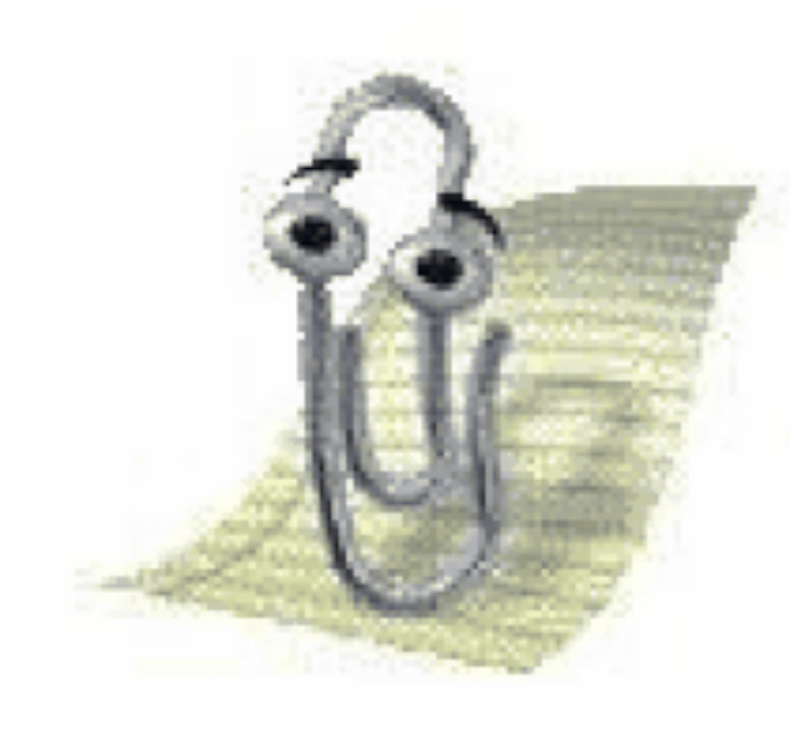


TECH CAN BE MAGICAL



SARAH DRASNER

@SARAH\_EDO





LIVE &  
MACHINE LEARN



The good, the bad,  
and the intriguing

The image shows a handwritten mathematical derivation on a blackboard. The main equation is:

$$\left( 2w + \frac{\sum_{i=1}^n x_i^2}{n} \pm \sqrt{4t_2^2 \frac{w(1-w)}{n} + \left( \frac{\sum_{i=1}^n x_i^2}{n} \right)^2} \right) \left( \frac{1}{n} \right)$$

Below this, an arrow labeled  $n \rightarrow \infty$  points to the asymptotic expansion:

$$\frac{1}{2} \left( 2w \pm \sqrt{4t_2^2 \frac{w(1-w)}{n}} \right) \cdot$$

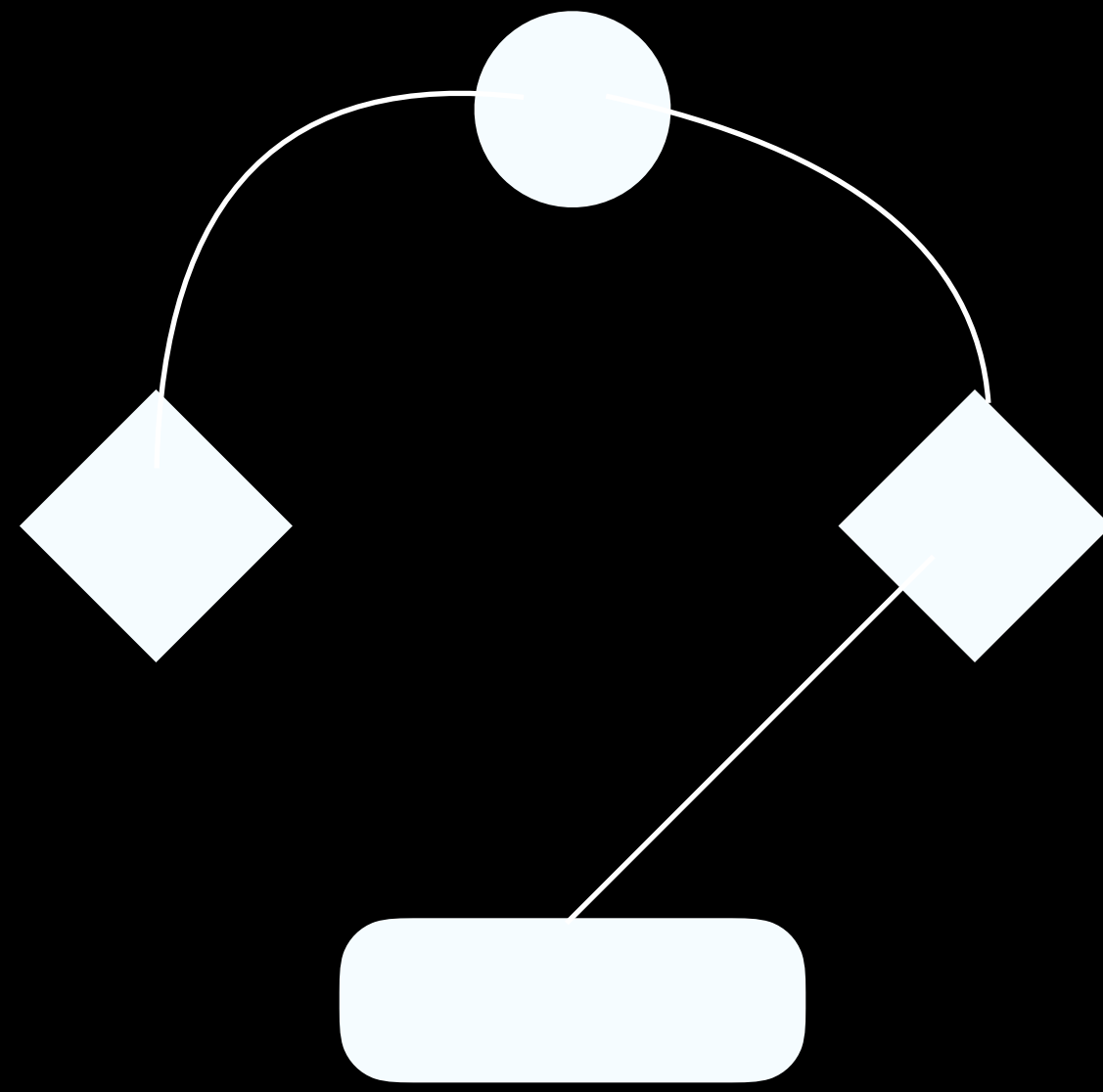
Other visible equations include  $\frac{t_1^2}{n} \left( \frac{1-p}{n} \right) = \sigma$  and  $\frac{t_2^2}{n} \left( \frac{1-p}{n} \right)$ .



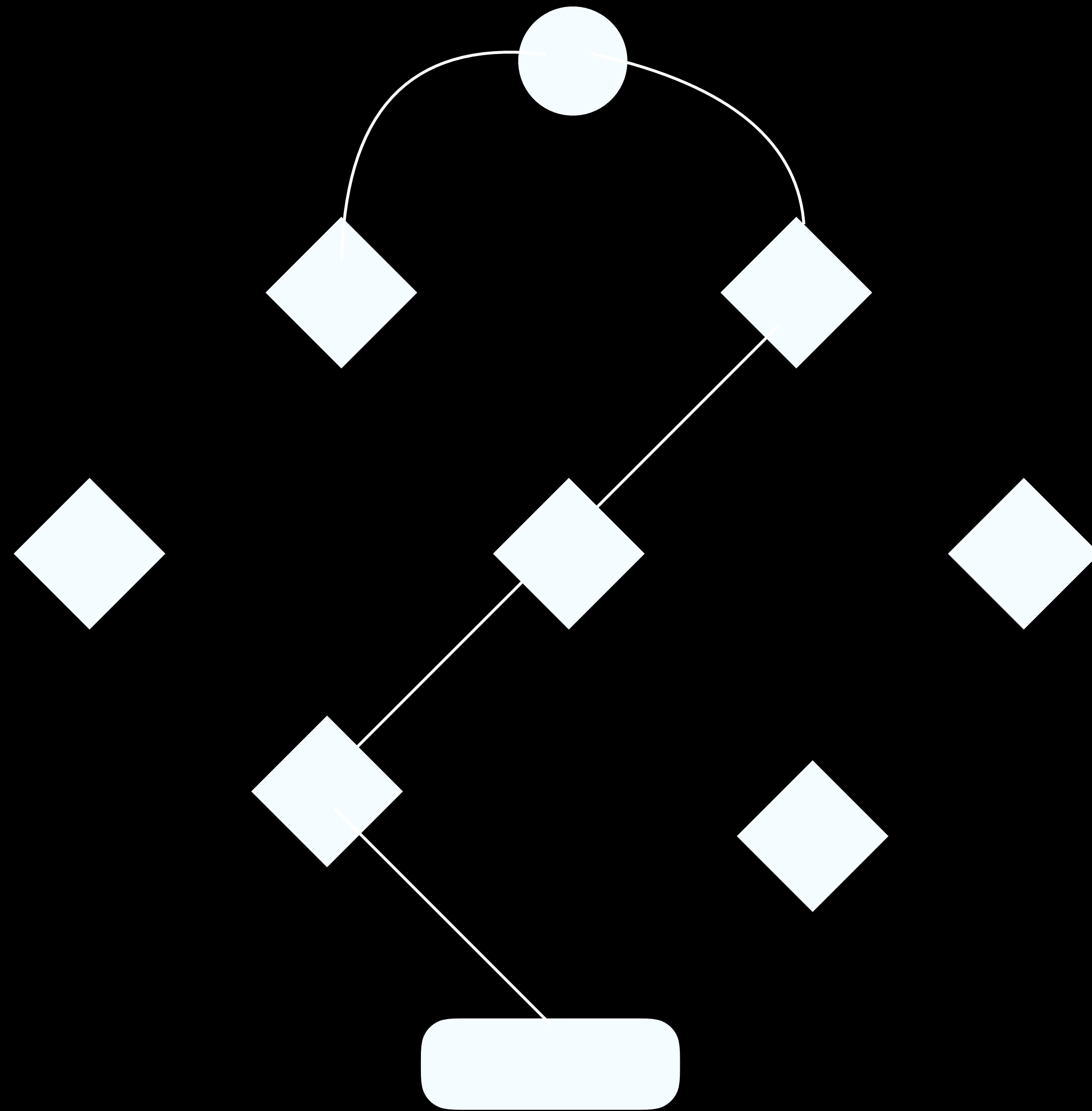
"MACHINE LEARNING GIVES COMPUTERS  
ABILITY TO LEARN WITHOUT BEING  
EXPLICITLY PROGRAMMED"

ARTHUR SAMUEL, 1959

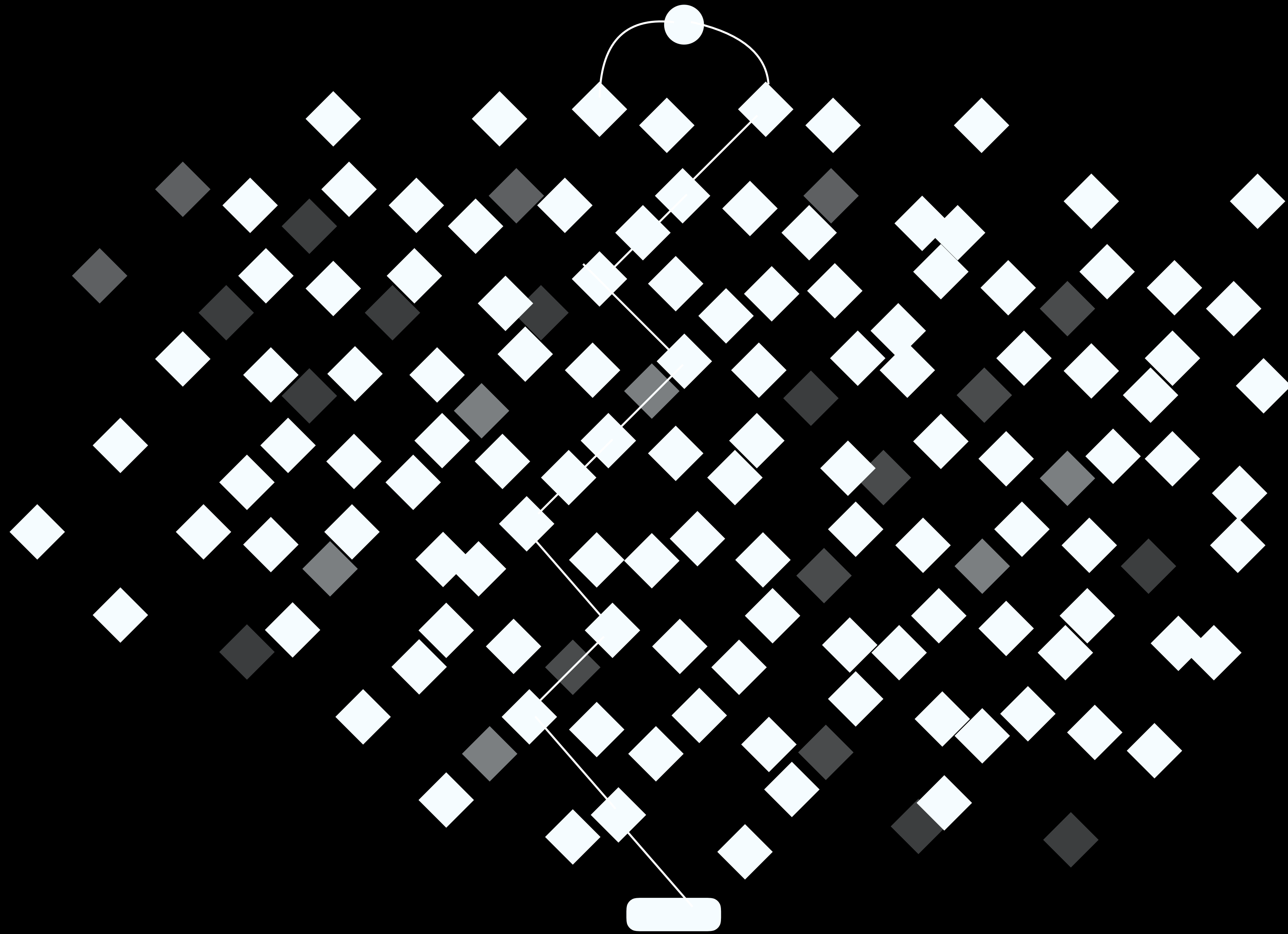




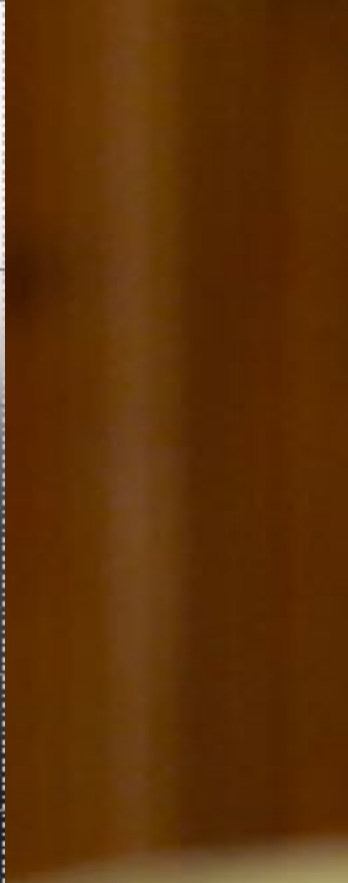
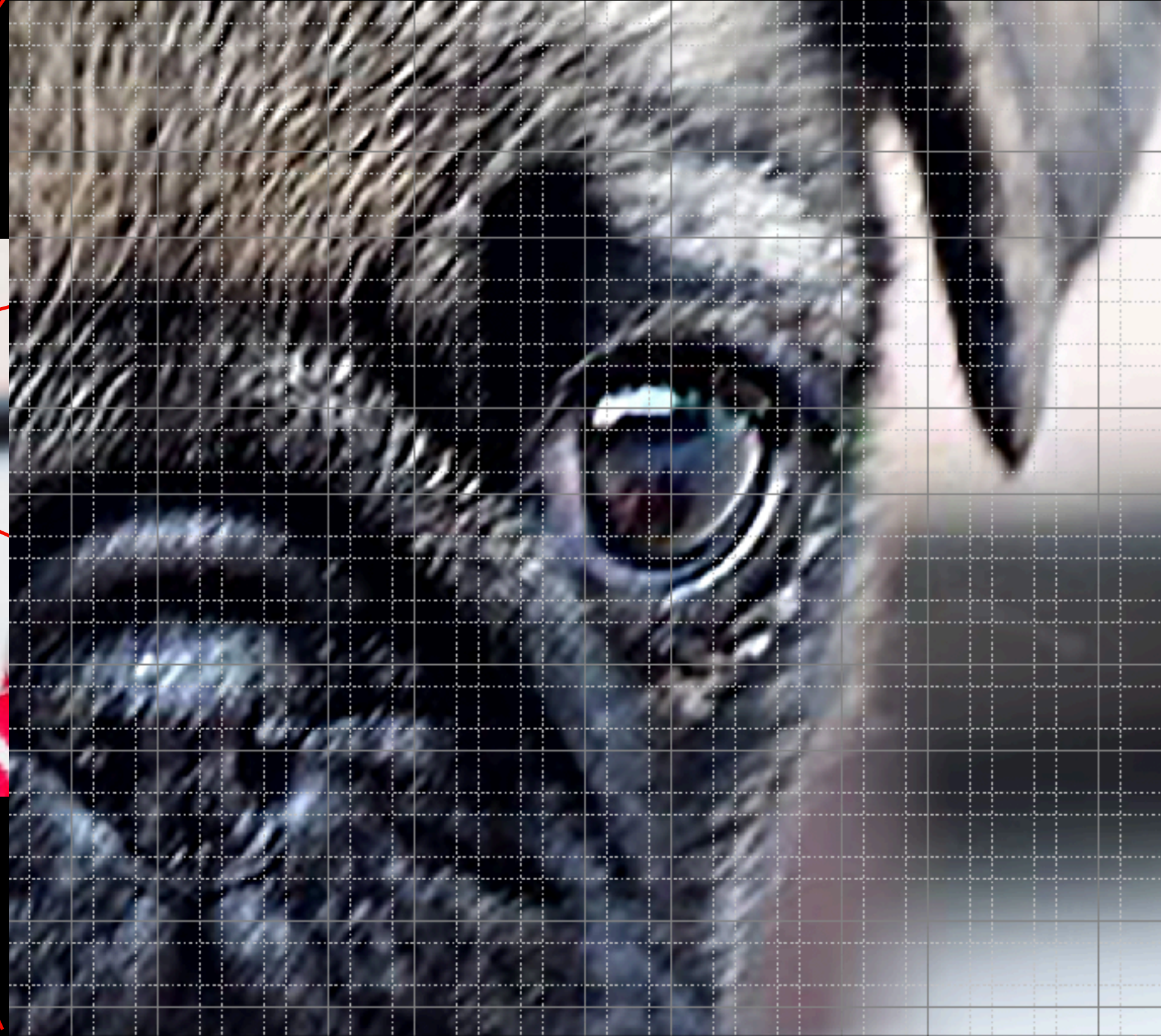
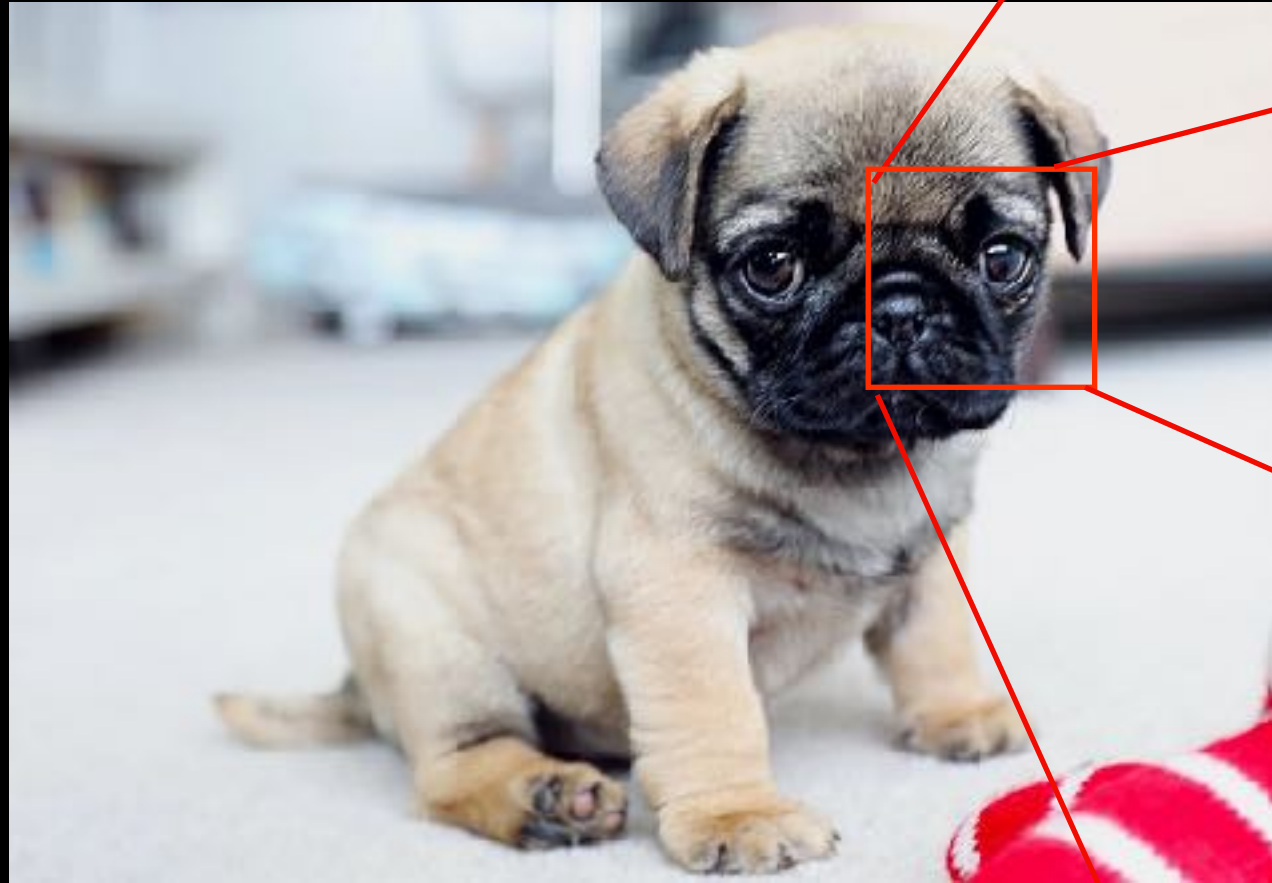


















# SUPERVISED



Pug



Pug



Pug



Kitten



Kitten



Kitten



# UNSUPERVISED



?



SUPERVISED



Naive Bayes

Nearest Neighbor

Genetic

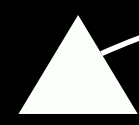
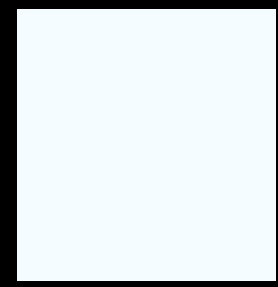
Convolutional Neural Networks

Support Vector Machines

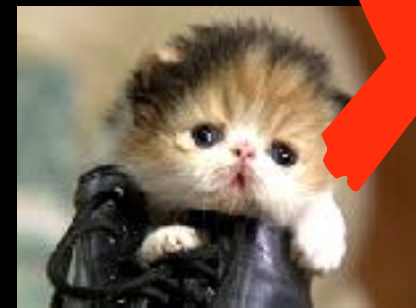
Linear Regression

Back Propagation Neural Network

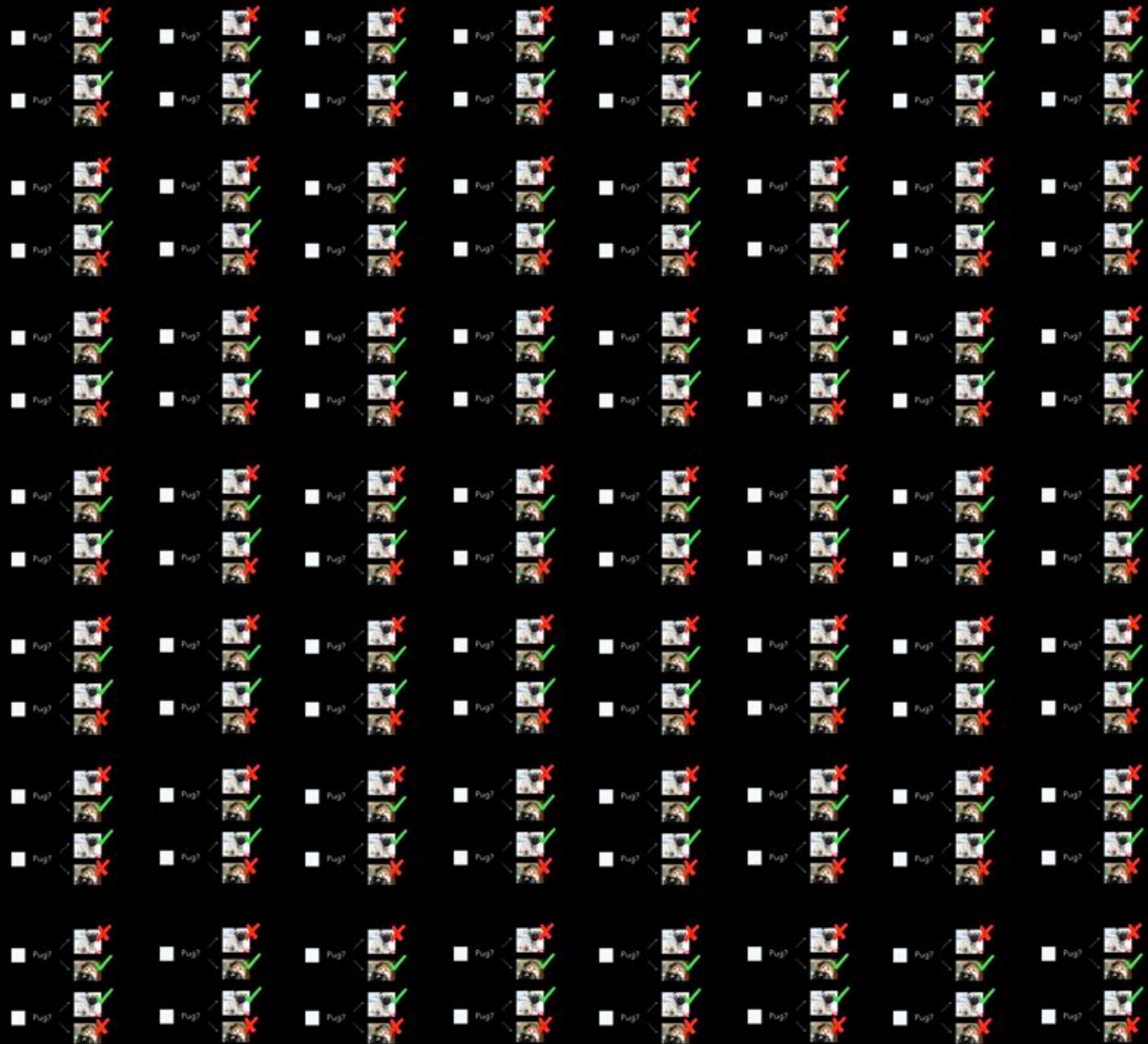
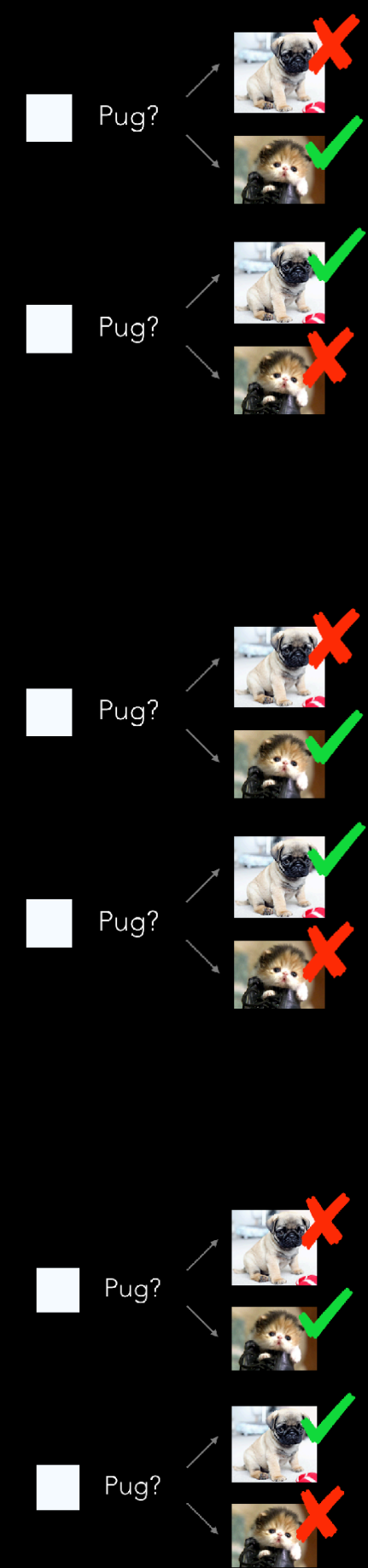




Pug?



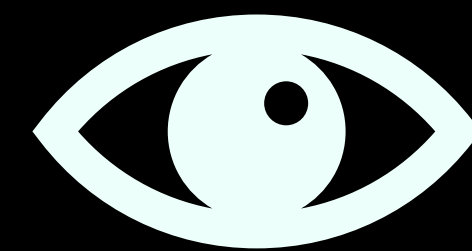
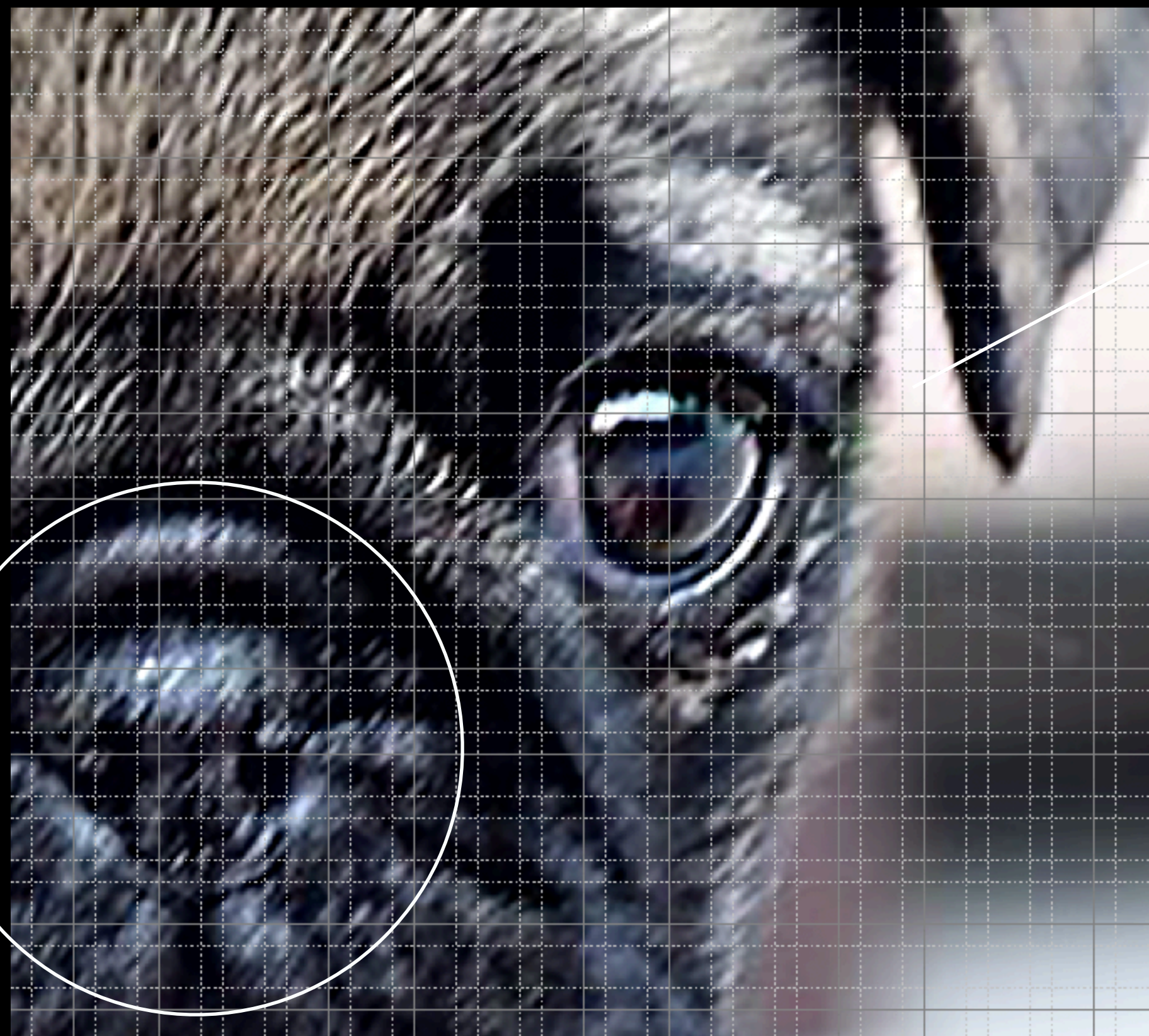




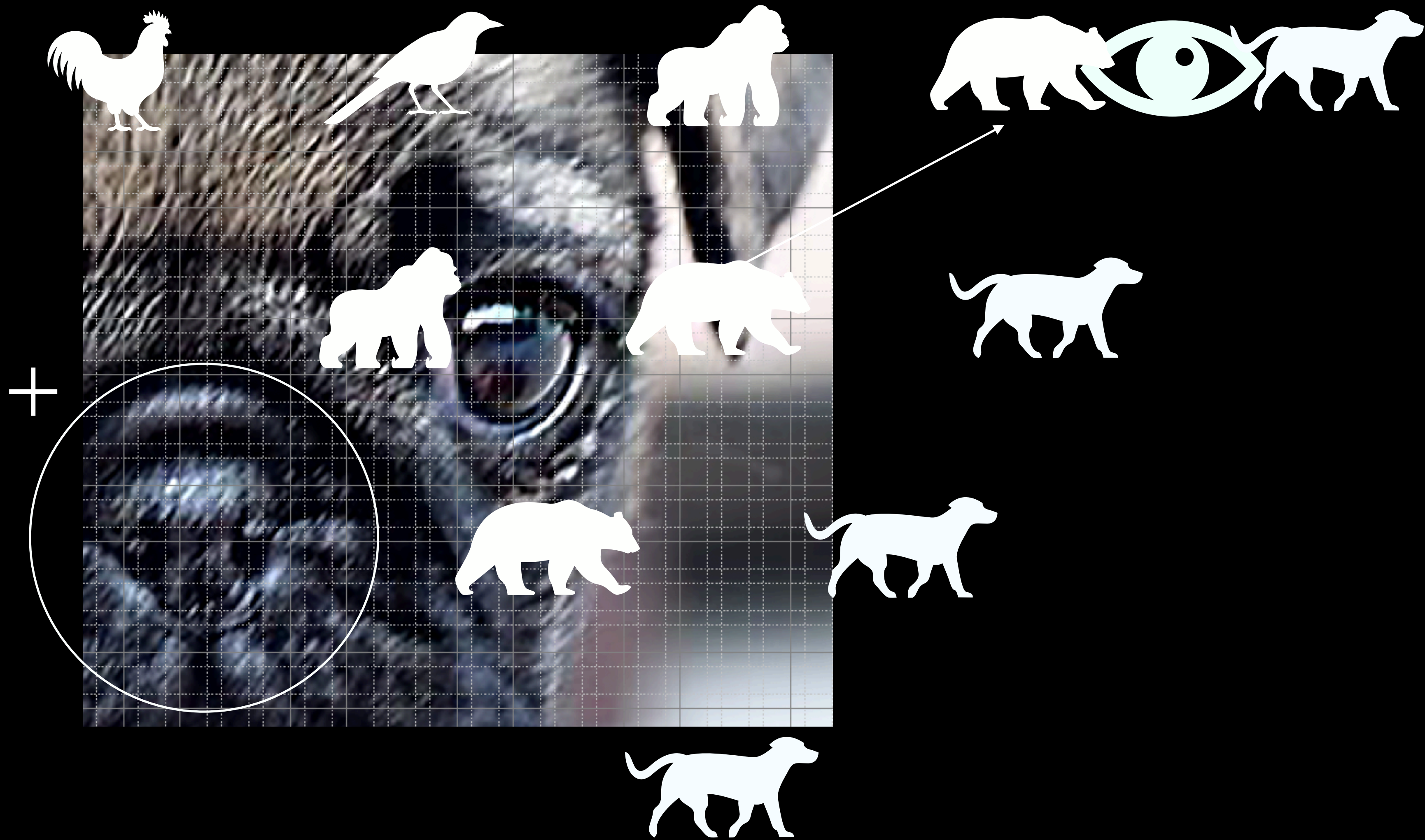
@sarah\_edo



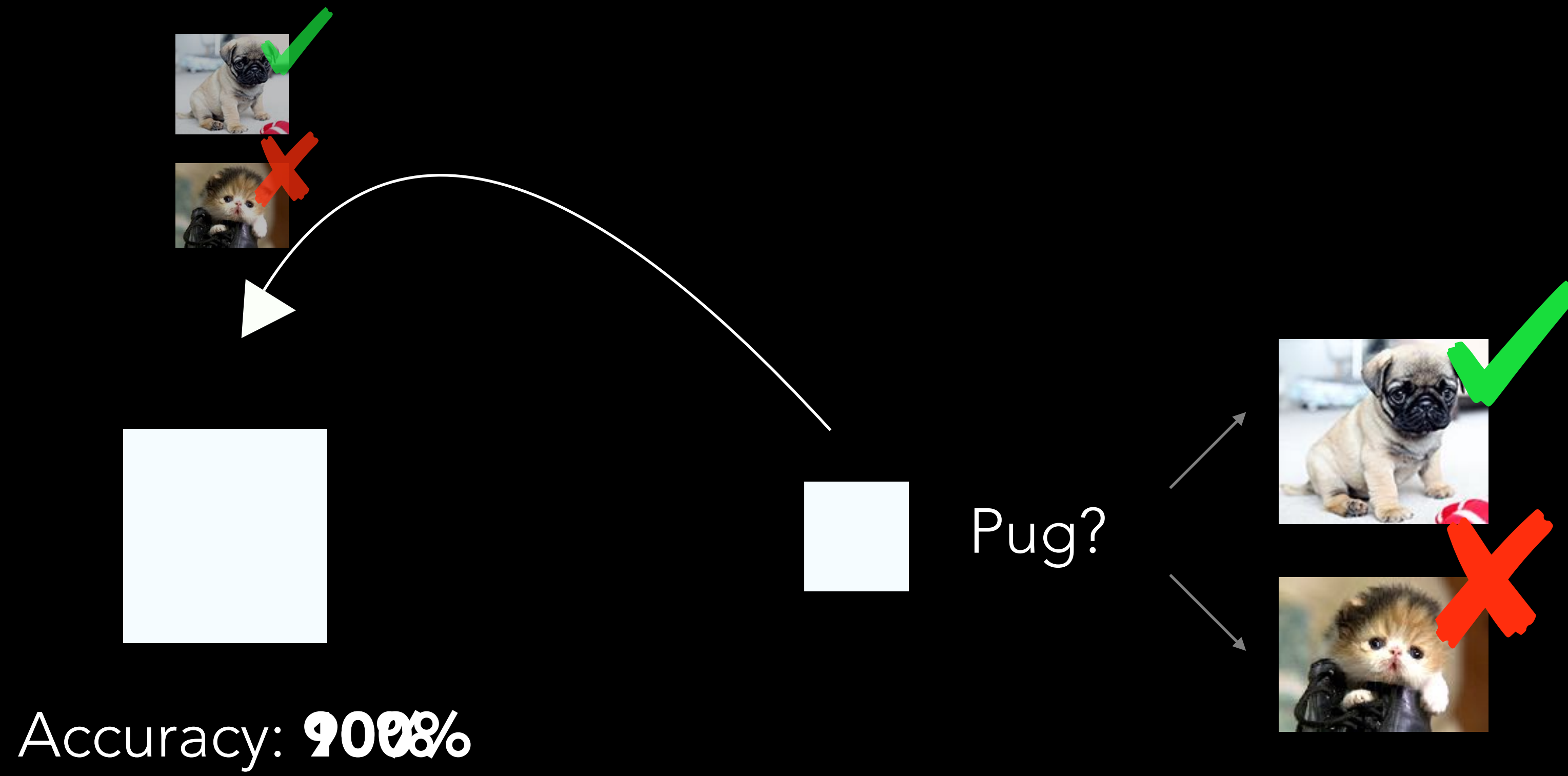
+



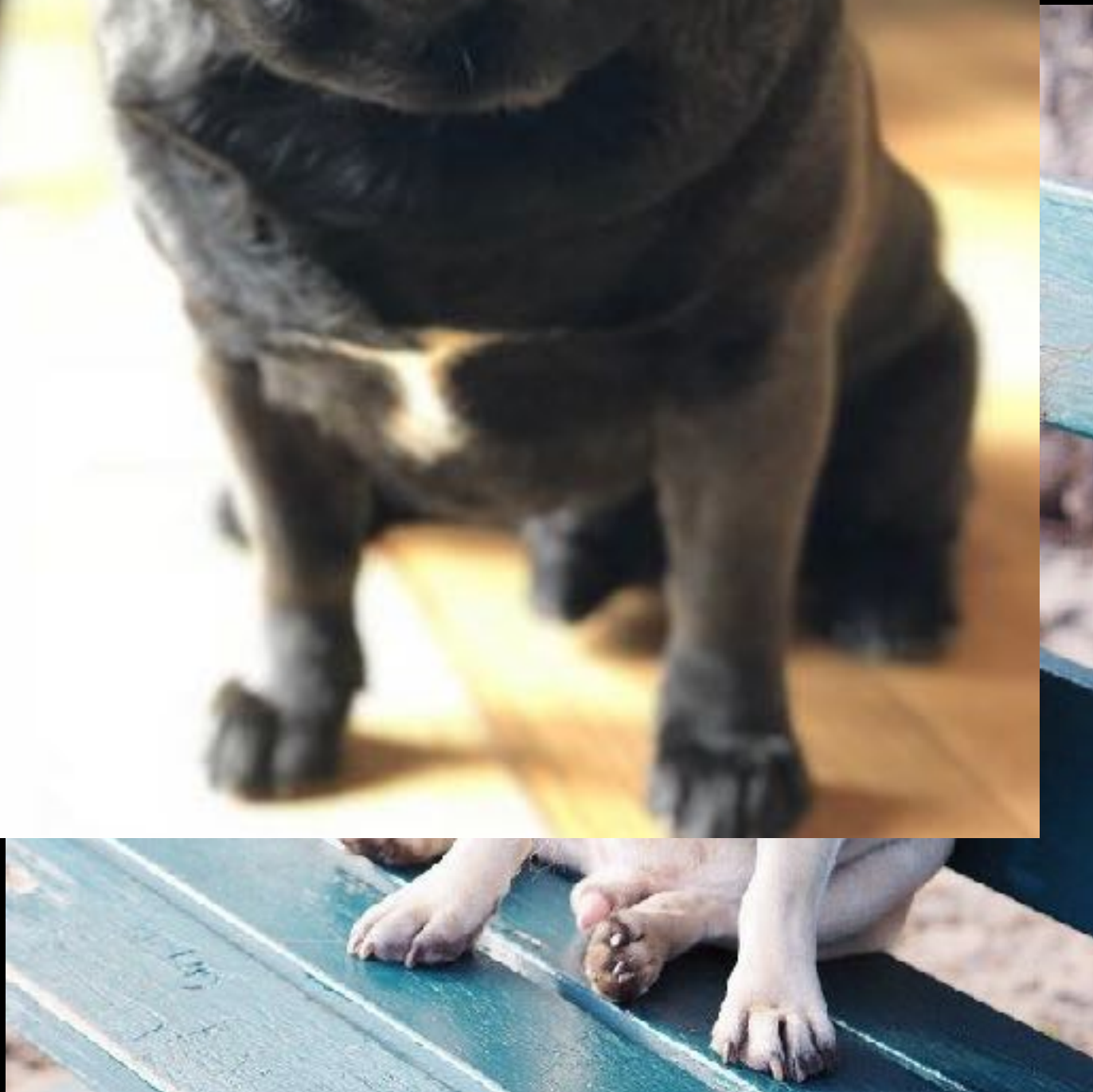








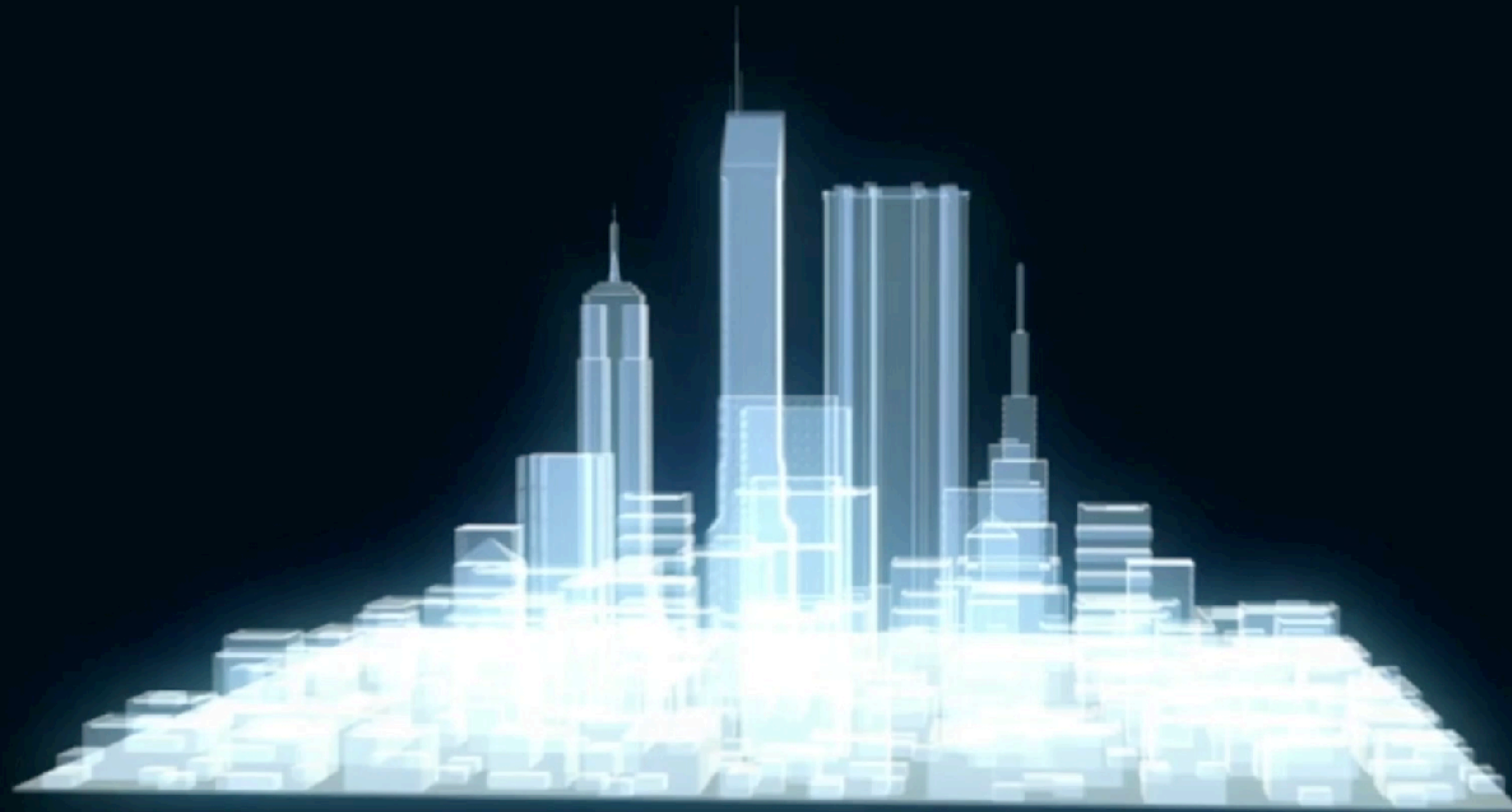






THE ROAD TO HELL IS PAVED  
WITH GOOD INTENTIONS





PredPol

SOURCE: WEAPONS OF MATH DESTRUCTION

@sarah\_edo



# ONCE A CRIMINAL, ALWAYS A CRIMINAL

- 68% become re-offenders within 3 years,  
77% in 5 years
- People report to finding it hard to fit back into  
“normal” life once being in prison for a while
- Employment becomes more difficult

SOURCE: US DEPARTMENT OF JUSTICE



RISK ASSESSMENT

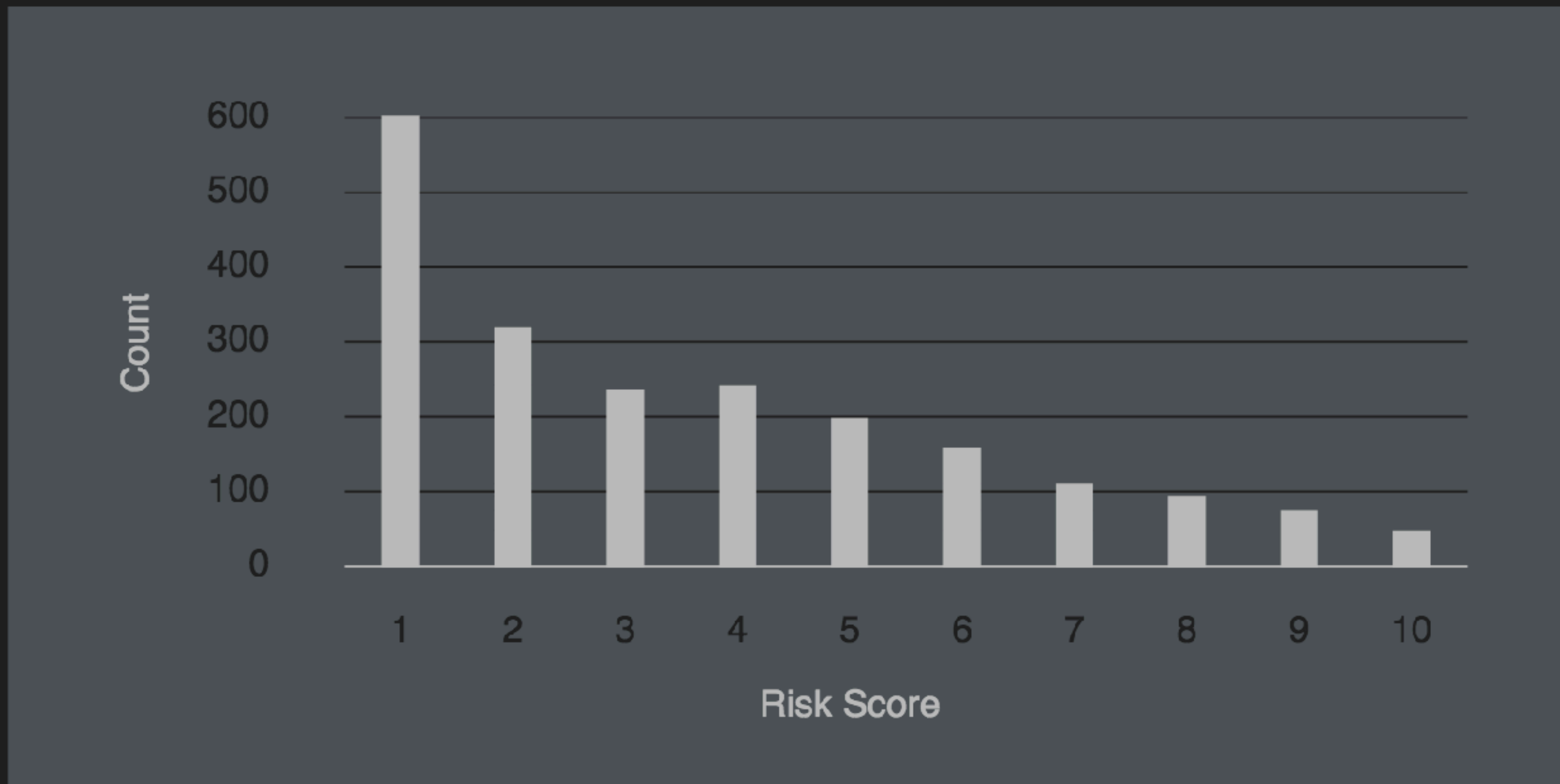
# COMPAS

Recidivism Score is used to determine whether someone will commit another crime within two years.

SOURCE: PRACTITIONER'S GUIDE TO COMPAS SCORES



## White Defendants' Risk Scores



SOURCE: MACHINE BIAS, RISK ASSESSMENT IN CRIMINAL SENTENCING



	WHITE	AFRICAN AMERICAN
Labeled Higher Risk, But Didn't Re-Offend	23.5%	44.9%
Labeled Lower Risk, Yet Did Re-Offend	47.7%	28.0%

Blacks are almost ***twice as likely*** as whites to be labeled a higher risk but not actually re-offend



## Two Shoplifting Arrests

**JAMES RIVELLI**

---

**Prior Offenses**

1 domestic violence  
aggravated assault, 1  
grand theft, 1 petty  
theft, 1 drug trafficking

---

**Subsequent Offenses**

1 grand theft

**LOW RISK**

**3**

**ROBERT CANNON**

---

**Prior Offense**

1 petty theft

---

**Subsequent Offenses**

None

**MEDIUM RISK**

**6**



## Two DUI Arrests

**GREGORY LUGO**

---

**Prior Offenses**  
3 DUIs, 1 battery

---

**Subsequent Offenses**  
1 domestic violence  
battery

**LOW RISK**

**1**

**MALLORY WILLIAMS**

---

**Prior Offenses**  
2 misdemeanors

---

**Subsequent Offenses**  
None

**MEDIUM RISK**

**6**





ZILLY, 48, CONSTRUCTION WORKER



# WHAT MAKES COMPAS FAIL?

- No transparency
- It doesn't adapt over time
- People use it without asking questions
- Including whether this is the right place for an algorithm at all.

CAN ONLY EVALUATE THE PAST



“I don’t like the idea myself of COMPAS being the sole evidence that a decision would be based upon.”

-Brennan, co-creator of COMPAS

PEOPLE WILL SAY ALGORITHMS  
CAN'T BE BIASED.

BUT ALGORITHMS ARE  
WRITTEN BY PEOPLE.



# ACXIOM, A DATA BROKERAGE

- Had an average of 1500 data points for 500 million consumers, including ***the entire adult population*** of the United States
- That was in 2012.
- That's just one company.

SOURCE: TECHNICALLY WRONG

# WHAT DOES FACEBOOK THINK ABOUT ME?

James Patterson  
The Oatmeal  
Trench Coats  
Software Developer  
Mermaid  
Wine  
Shoes  
Science  
Neuroscience  
Cloud computing  
Animated Movies  
Navy  
Knitting  
Sports  
Toys  
Dogs  
Do it yourself  
3d computer graphics



- Facebook uses these tags to drive directed ads
- You can use it to target on demographics, including race
- Buying a house- limited to races
- Illegal under the Fair Housing Act of 1968
- Once pointed out, **Facebook fixed it**

SOURCE: TECHNICALLY WRONG





“It’s not that digitizing the world is inherently bad.  
But the more technology becomes embedded in all  
aspects of life, the more it matters whether that  
technology is biased, alienating, or harmful”

–SARA WACHTER-BOETTCHER,  
AUTHOR OF DESIGN FOR REAL LIFE

Absolutely! It's like the risk we take every time we get into cars or airplanes - they've completely transformed every aspect of life, and made so many things possible that would have been impossible before

but they're inherently dangerous, and can be seriously misused



Feb 3






**“HUGE INSPIRATIONAL QUOTE  
ON A LANDSCAPE”**


**-Famous smart person**



# Azure's Emotion API

[Check out the docs](#) 

---

Select an image:   
or use one of mine








@sarah\_edo



## Dynamically Generated Alt Text

With Azure's Computer  
Vision API

[Check out the docs](#) →

Select an image here: 

Or enter a url:

Or use one of mine

[More info...](#)





```
<input type="file" name="file" id="file" class="inputfile" @change="fileUpload" />
<label for="file" aria-label="upload image">
  <svg
    xmlns="http://www.w3.org/2000/svg"
    width="45" height="45"
    viewBox="0 0 32 32"
    aria-labelledby="plus"
    role="presentation">
    <title id="plus">Plus Sign</title>
    <circle cx="15" cy="15" r="15" fill="#bf310b" />
    <line x1="15" x2="15" y1="10" y2="20" fill="none" stroke-weight="2" stroke="#fff" />
    <line x1="10" x2="20" y1="15" y2="15" fill="none" stroke-weight="2" stroke="#fff" />
  </svg>
</label>
```

```
fileUpload(e) {
  var files = e.target.files || e.dataTransfer.files;
  if (!files.length) return;
  this.image = files[0];
  this.createImage();
  this.visionReq();
},
createImage() {
  var image = new Image();
  var reader = new FileReader();

  reader.onload = e => {
    this.image = e.target.result;
  };
  reader.readAsDataURL(this.image);
},
```



```
apiReq(params, urlPath) {  
  let uribase = `https://westcentralus.api.cognitive.microsoft.com/vision/v1.0/${urlPath}`;  
  ...  
  
  return axios({  
    method: "post",  
    url: uribase,  
    data: data,  
    params: params,  
    headers: {  
      "Content-Type": contentType,  
      "Ocp-Apim-Subscription-Key": "xxxxxxxxxxxxxxxxxx"  
    },  
    validateStatus(status) {  
      return status < 500;  
    }  
  });  
},
```

```
visionReq() {
  let param1 = {
    language: "unk",
    "detectOrientation ": "true"
  };
  let param2 = {
    visualFeatures: "Categories,Description,Color",
    details: "",
    language: "en"
  };
  ...

  this.apiReq(param2, "analyze").then(response => {
    if (response.status === 200) {
      this.desc = response.data.description.captions[0].text;
    } else {
      this.noText = true;
    }
  });
},
```





WHAT ELSE CAN COGNITIVE SERVICES DO?

LUIS





NO PARKING  
TOY-ZONE

cta

6838

cta

THERMO KING

the new  
104.3  
JACK  
playing





NO PARKING  
TOY-ZONE

cta

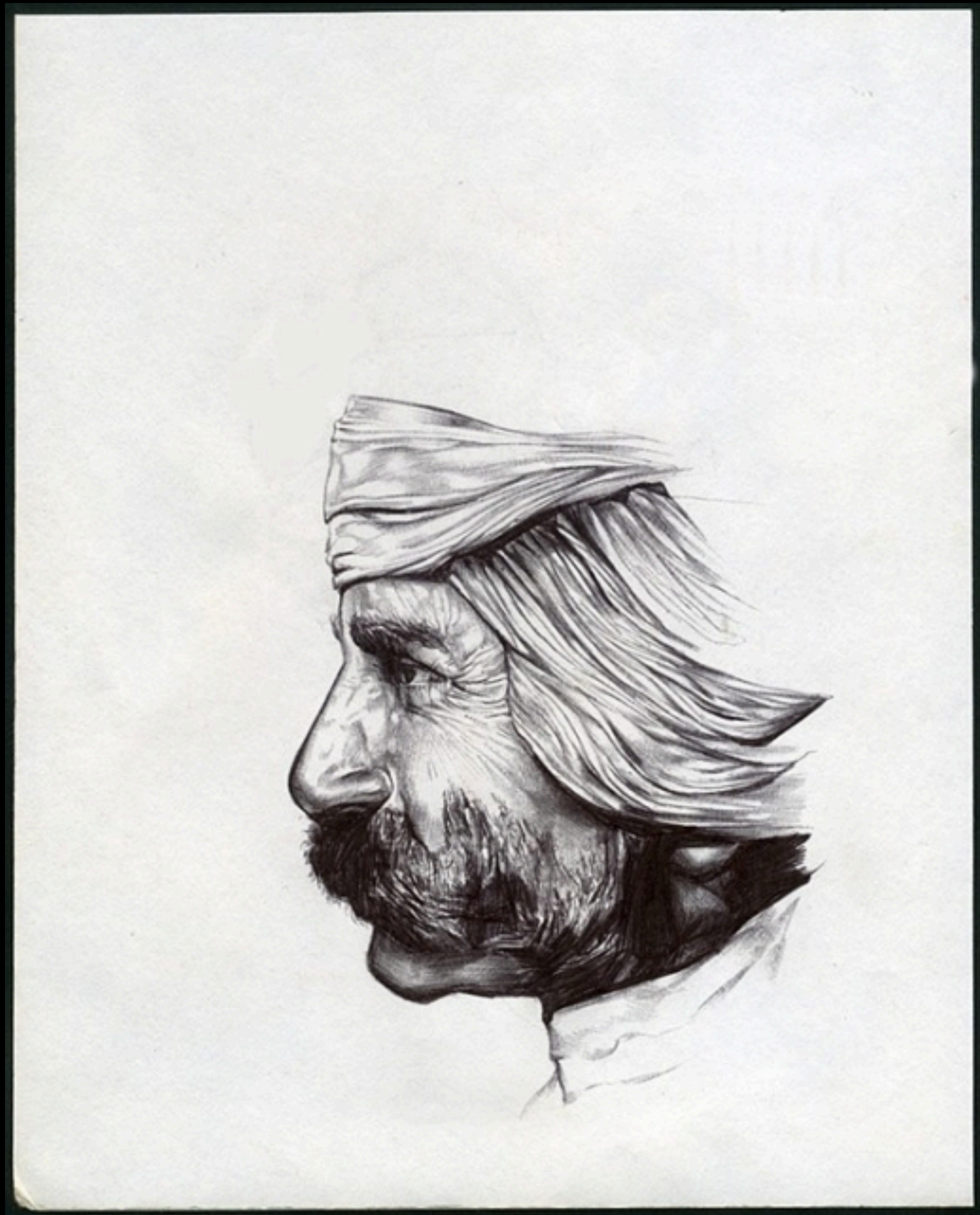
6838

cta

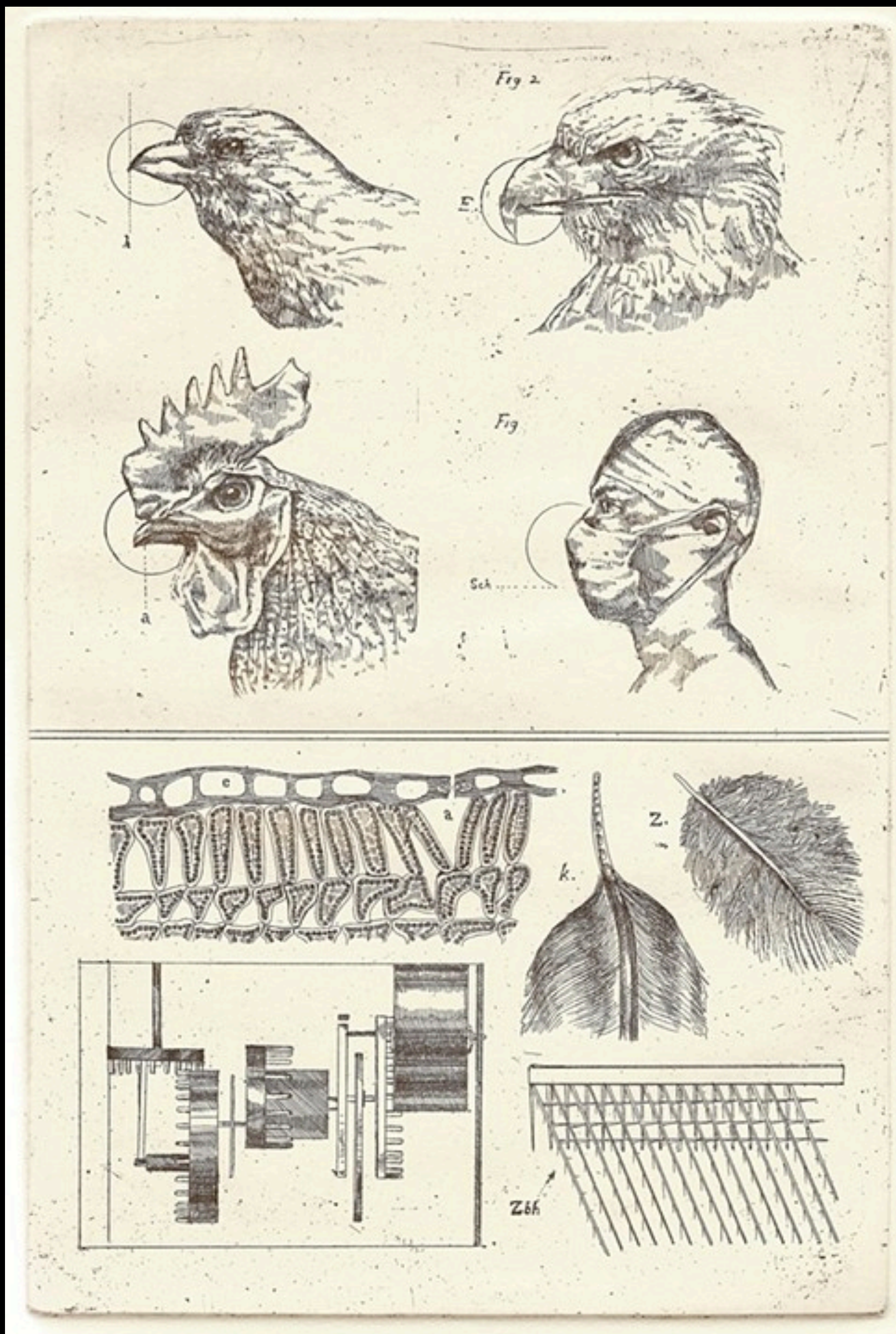
THERMO KING

the new  
104.3  
JACK  
playing













@sarah\_edo





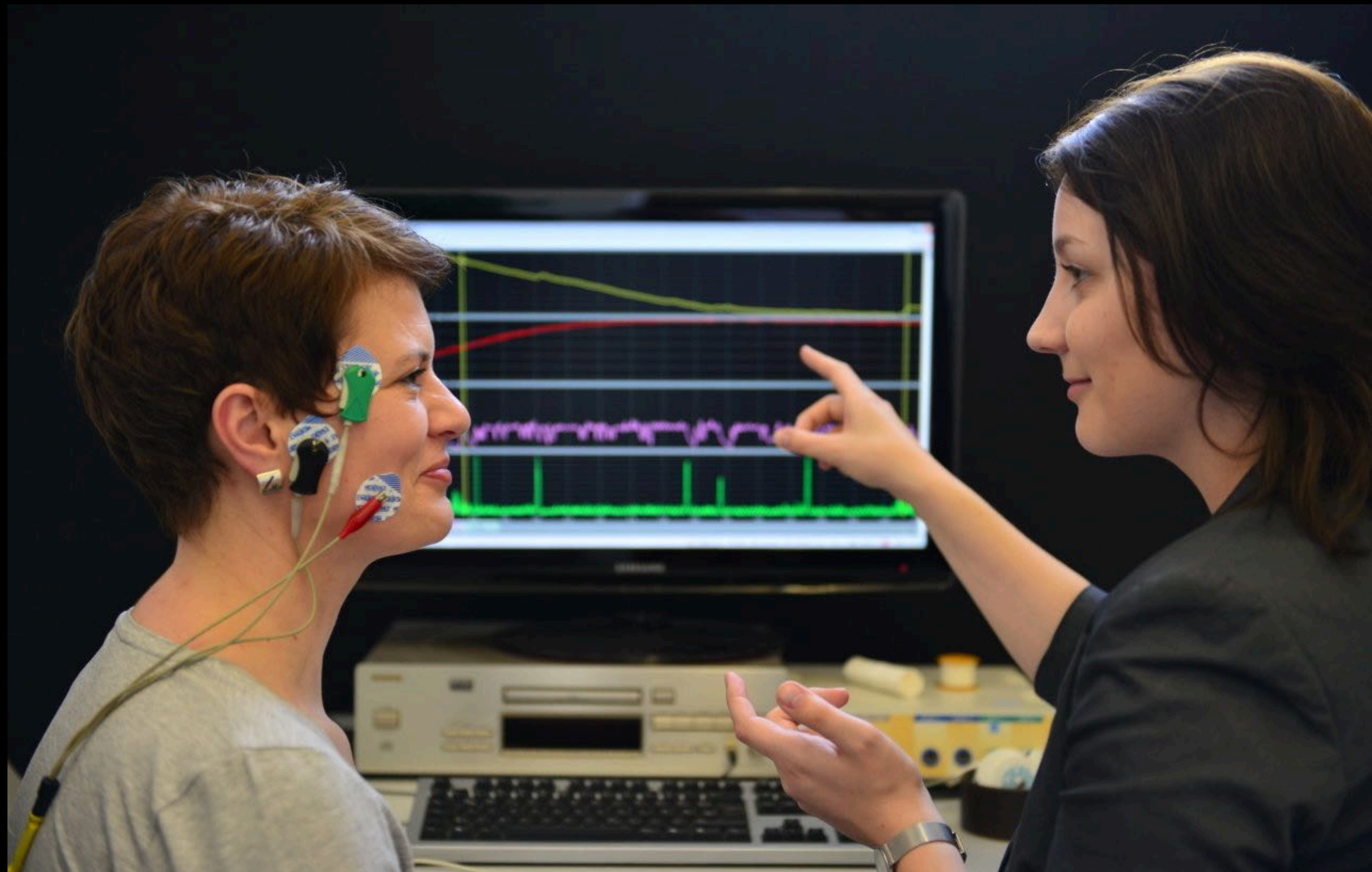






**SLOW DOWN**

# BIOFEEDBACK





# How do you feel?

Some options...

*excited, nervous, frustrated, happy, calm, tipsy*

Hit the button and start recording



**LUIS**

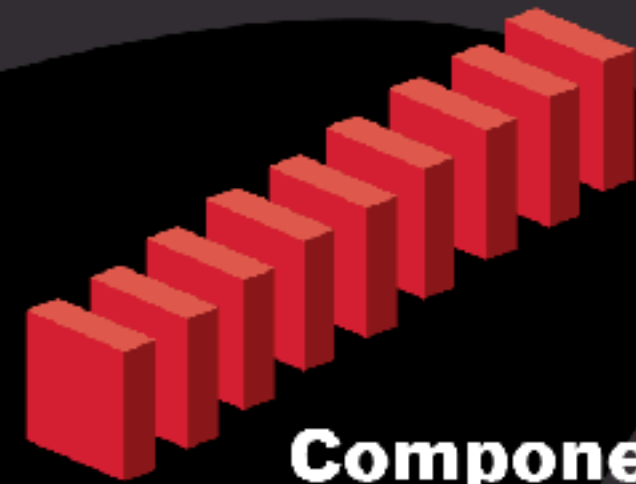


**App**

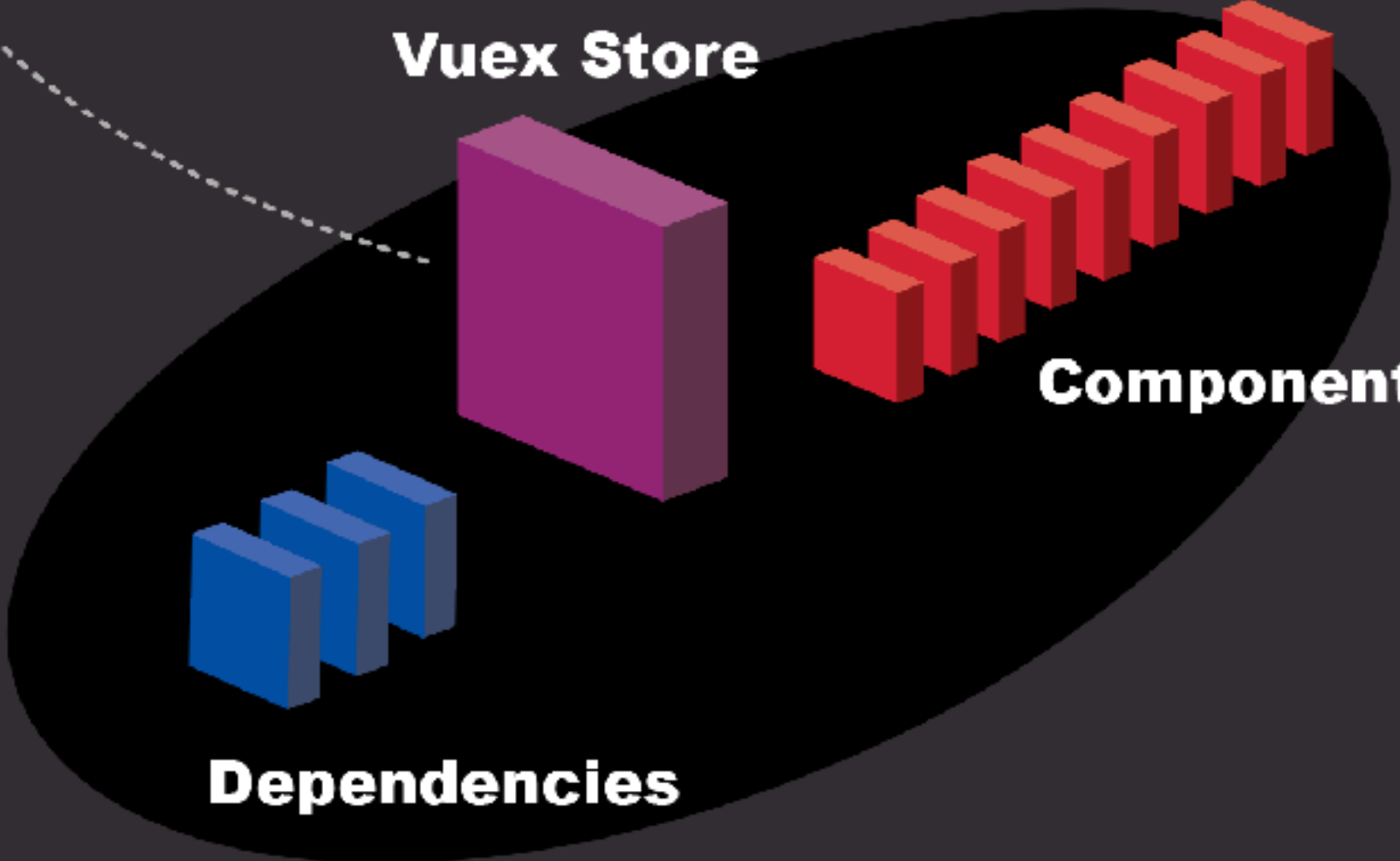
**Vuex Store**



**Components**



**Dependencies**





## In store.js (Vuex)

```
getUnderstanding({ commit }, utterance) {
  commit('setUiState', 'fetching')
  const url = `https://westus.api.cognitive.microsoft.com/luis/v2.0/apps
              /4aba2274-c5df-4b0d-8ff7-57658254d042`

  https: axios({
    method: 'get',
    url,
    params: {
      verbose: true,
      timezoneOffset: 0,
      q: utterance
    },
    headers: {
      'Content-Type': 'application/json',
      'Ocp-Apim-Subscription-Key': 'XXXXXXXXXXXXXXXXXXXX'
    }
  })
}
```

## In store.js (Vuex)

```
.then(({ data }) => {
  console.log('axios result', data)
  if (altMaps.hasOwnProperty(data.query)) {
    commit('newIntent', {
      intent: altMaps[data.query],
      score: 1
    })
  } else {
    commit('newIntent', data.topScoringIntent)
  }
  commit('setUiState', 'idle')
  commit('setZoom')
})
.catch(err => {
  console.error('axios error', err)
})
```



## In store.js (Vuex)

```
export default new Vuex.Store({
  state: {
    counter: 0,
    intent: 'None',
    intensity: 'None',
    score: 0,
    // idle - awaiting user input
    // listening - listening to user input
    // fetching - fetching user data from the API
    uiState: 'idle',
    zoom: 3
  },
  getters: {
    intentStr: state => {
      var str = state.intent
      str = str.replace(/\b(App.)\b/gi, '')
      return str
    },
  },
})
```

## In store.js (Vuex)

```
actions: {
  getSpeech({ dispatch, commit, state }) {
    commit('setUiState', 'listening')

    //keep recording speech all the time or activate it-
    //for the first screen no, press a button. second screen yes.
    state.intent === 'None'
      ? (recognition.continuous = true)
      : (recognition.continuous = false)

    recognition.start()

    recognition.onresult = function(event) {
      const last = event.results.length - 1
      const phrase = event.results[last][0].transcript
      dispatch('getUnderstanding', phrase)
    }
  },
  ...
}
```



^ App Assets

Intents

Entities

^ Improve app performance

Review endpoint utterances

Phrase lists

# Intents ?

Create new intent

Add prebuilt domain intent

Search intents



Name	Utterances	
<a href="#">App.Calm</a>	17	...
<a href="#">App.Excited</a>	11	...
<a href="#">App.Frustrated</a>	21	...
<a href="#">App.Happy</a>	29	...
<a href="#">App.Nervous</a>	18	...
<a href="#">App.Tipsy</a>	14	...
<a href="#">Intensity.Less</a>	18	...
<a href="#">Intensity.More</a>	19	...

<input type="checkbox"/> Utterance	Labeled intent <span>?</span>
<input type="checkbox"/> calm	App.Calm 0.97 <span>∨</span> <span>...</span>
<input type="checkbox"/> even	App.Calm 0.97 <span>∨</span> <span>...</span>
<input type="checkbox"/> i am calm	App.Calm 0.99 <span>∨</span> <span>...</span>
<input type="checkbox"/> i am even	App.Calm 0.99 <span>∨</span> <span>...</span>
<input type="checkbox"/> i am fine	App.Calm 0.73 <span>∨</span> <span>...</span>
<input type="checkbox"/> i am placid	App.Calm 0.98 <span>∨</span> <span>...</span>
<input type="checkbox"/> i am relaxed	App.Calm 0.99 <span>∨</span> <span>...</span>
<input type="checkbox"/> i am untroubled	App.Calm 0.99 <span>∨</span> <span>...</span>
<input type="checkbox"/> i am zen	App.Calm 0.99 <span>∨</span> <span>...</span>
<input type="checkbox"/> i feel composed	App.Calm 0.98 <span>∨</span> <span>...</span>



## In store.js (Vuex)

```
mutations: {  
  newIntent: (state, {intent, score}) => {  
    if (intent.includes('Intensity')) {  
      state.intensity = intent  
      if (intent.includes('More')) {  
        state.counter++  
      } else if (intent.includes('Less')) {  
        state.counter--  
      }  
    } else {  
      state.intent = intent  
    }  
    state.score = score  
  },  
  ...  
}
```

## In Base.vue (Components)

```
createShapes() {  
  this.bufferCamera.position.z = this.shapeZoom  
  
  if (this.torusKnot !== null) {  
    this.torusKnot.material.dispose()  
    this.torusKnot.geometry.dispose()  
    this.bufferScene.remove(this.torusKnot)  
  }  
  
  var shape = new THREE.TorusKnotGeometry(  
    this.tConfig.a,  
    this.tConfig.b,  
    this.tConfig.c,  
    this.tConfig.d  
  ),  
  material  
  
  ...  
  this.torusKnot = new THREE.Mesh(shape, material)  
  this.torusKnot.material.needsUpdate = true  
  
  this.bufferScene.add(this.torusKnot)  
},
```



## In Base.vue (Components)

```
animate() {  
  this.storeRAF = requestAnimationFrame(this.animate)  
  
  this.bufferScene.rotation.x += 0.01  
  this.bufferScene.rotation.y += 0.02  
  
  this.renderer.render(  
    this.bufferScene,  
    this.bufferCamera,  
    this.bufferTexture  
  )  
  this.renderer.render(this.scene, this.camera)  
},
```

## In Base.vue (Components)

```
watch: {  
  shapeZoom() {  
    this.createShapes()  
    cancelAnimationFrame(this.storeRAF)  
    this.animate()  
  }  
},
```

Repo: [github.com/sdras/three-vue-pattern](https://github.com/sdras/three-vue-pattern)





@sarah\_edo

# ML IN MEDICINE

- Sophia Genetics is training algorithms to diagnose diseases through DNA analysis
- All4Cure is a social network for cancer patients where patients can enter diagnosis and treatment so that it can be analyzed
- HealthMap algorithm spotted an ebola outbreak 9 days before the World Health Organization



WHAT CAN YOU DO?



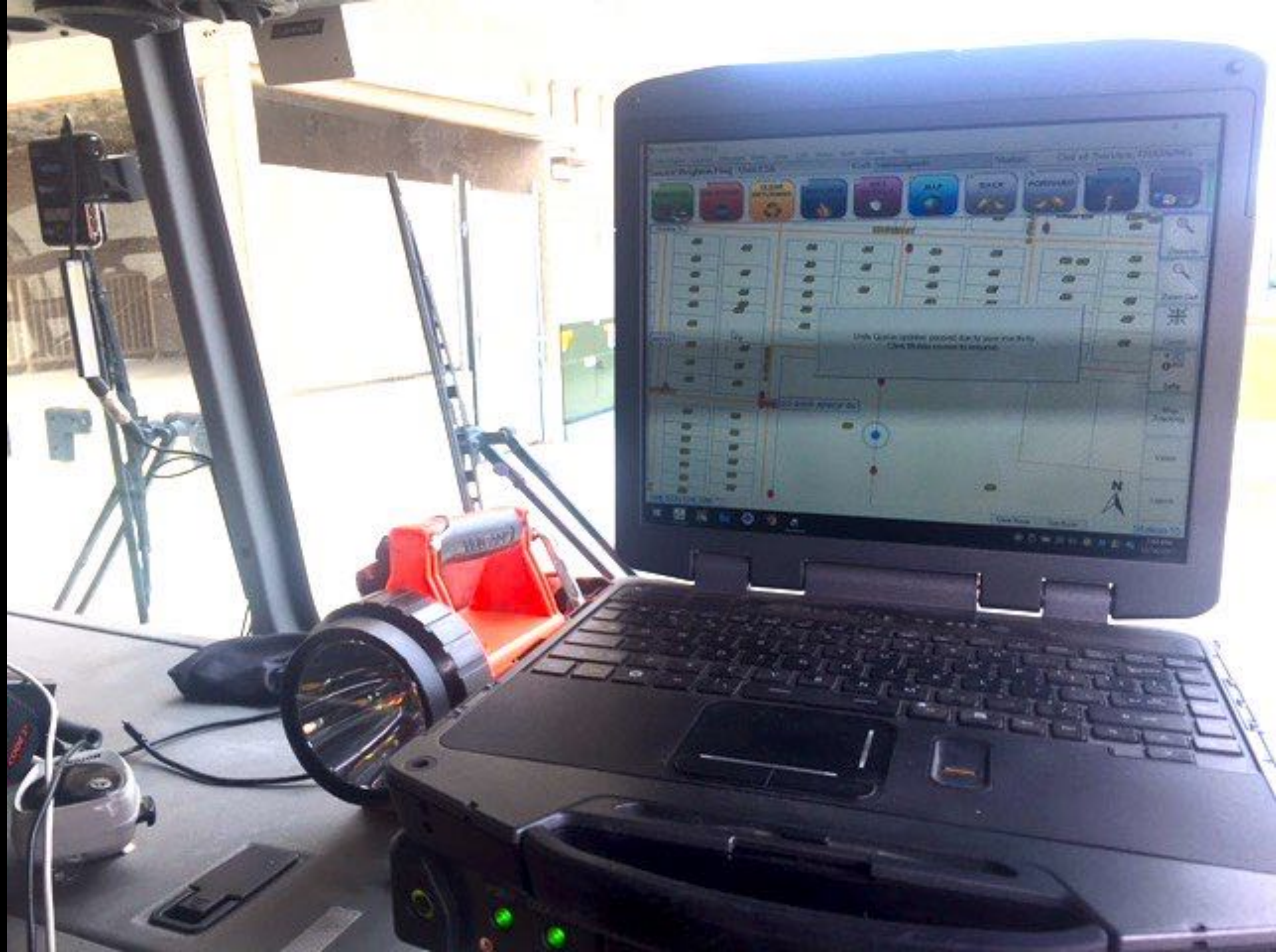
APPLICATIONS FOR GOOD





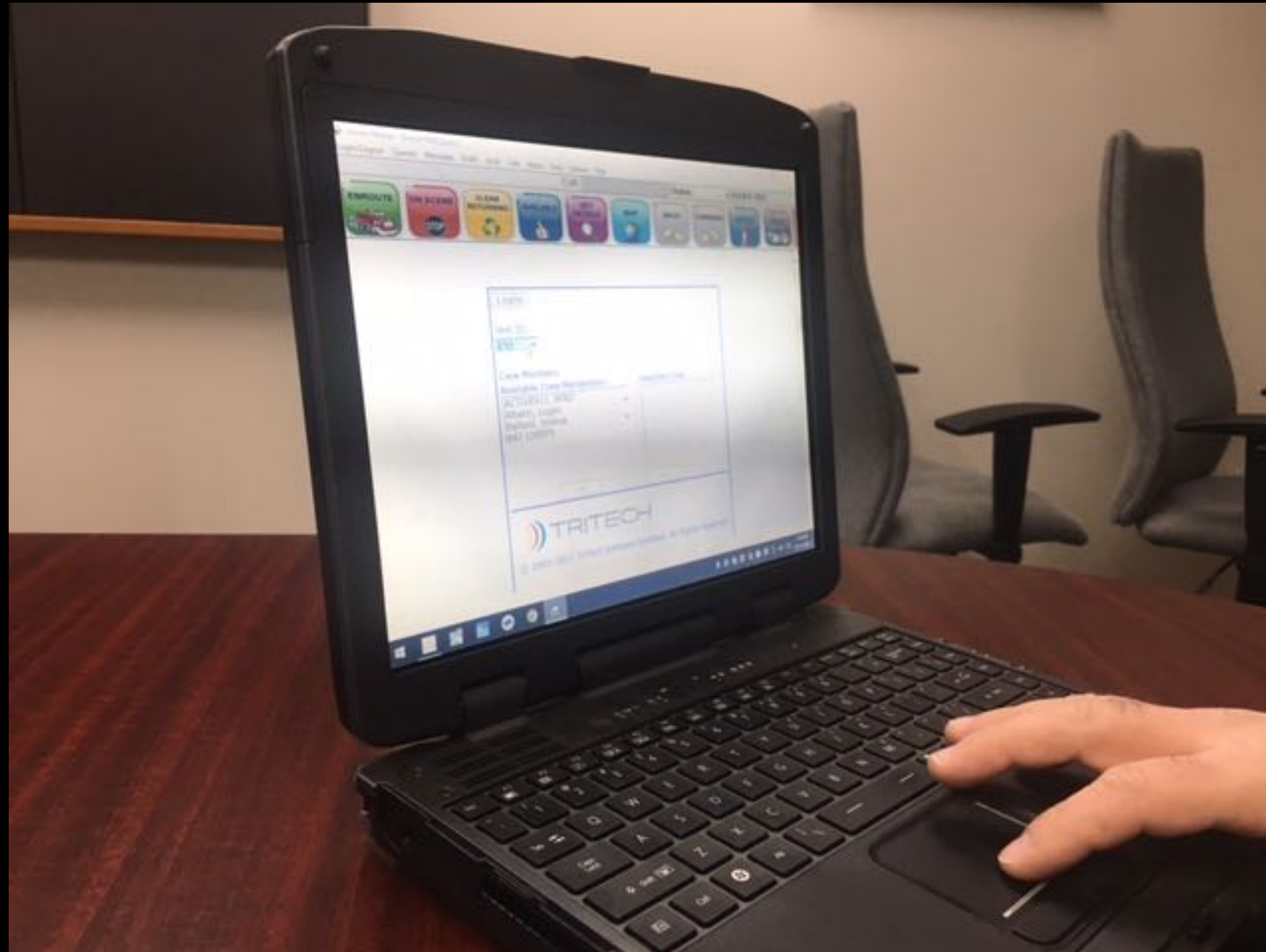








# CURRENT APPLICATION



BUT...

WHAT HAPPENS WHEN  
THEY'RE OFFLINE?





# backgroundSync && Service Workers

- Alert them when they are offline
- When they're offline, queue the messages
- When it's back up, send them out  
(even if the browser tab is closed)

Online. Clear to send.

ENROUTE

ON SCENE

WATER

BACKUP

CLEAR  
RETURNING

GET DETAILS

AVAILABLE



## Alert them when they're offline

```
window.addEventListener('online', vm.isOnline);  
window.addEventListener('offline', vm.isOnline);
```

```
isOnline() {  
  if (navigator.onLine) {  
    this.status = `Online. Clear to send.`  
    this.offline = false  
  }  
  else {  
    this.status = `Offline. But don't worry, your requests  
    will still be processed soon as you are  
    connected.`  
    this.offline = true  
  }  
},
```

# Register the service worker when a request is made

```
requestButton(type) {  
  if ('serviceWorker' in navigator) {  
    navigator.serviceWorker.register('./service-worker.js').then((registration) => {  
      return navigator.serviceWorker.ready;  
    }).then((registration) => {  
      registration.sync.register(`request-${type}`).then(() => {  
        console.log('%c sync registered', 'font-size: 16px; ...');  
      }).catch(function (error) {  
        console.log('Unable to fetch resources.');      });  
    });  
    ...  
  }  
}
```



## Create the sync event

```
self.addEventListener('sync', event => {
  let type = event.tag.split('-')[1]
  console.log(
    `%c sync event fired: request ${type}`,
    `${styles} background: #00449e; color: #cdecff;`
  )
  event.waitUntil(fetchResource(type))
})
```

Fetch the URL, and postMessage back to the client

```
const fetchResource = resource => {
  fetch('//jsonplaceholder.typicode.com/users')
    .then(response => {
      return response
    })
    .then(text => {
      const message = {
        response: text.status,
        resource: resource
      }
      self.clients
        .matchAll()
        .then(all => all.map(client => client.postMessage(message)))
    })
    ...
}
```



## Let them know when it's successful

```
updateRequest(response, type) {  
  if (response === 200) {  
    this.responseSuccess = true  
    this.messageQueue.push(  
      `You successfully sent a message: <span>${type}</span>`  
    )  
  }  
},
```

MOST IMPORTANT...

# ASK QUESTIONS





# The Cocktail Finder

## FIND YOUR NEW FAVORITE DRINK

Search by type, ingredient, title, or randomly explore

### EXPLORE BY TYPE

Select Category ▼

### EXPLORE BY LIQUOR

Select Liquor ▼

### EXPLORE BY INGREDIENT

Ingredient

### EXPLORE BY GLASS





**CITY**

**BUILDINGS**

**YOUR HOUSE**





THANK YOU!

@sarah\_edo