AI & How It Will Impact Humanity & Society
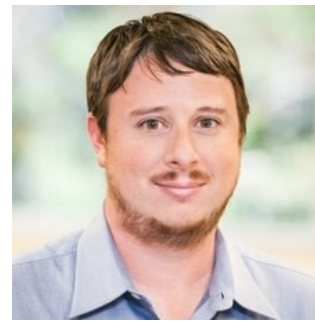
July 21, 2020
Online (Zoom)

Matt Sanchez
CognitiveScale

Jean-Leah Njoroge
Dell Technologies

Dave DeCaprio
ClosedLoop

AUSTIN FORUM
ON TECHNOLOGY & SOCIETY

@AustinForum
#AIatAF

Welcome *to the Austin Forum on Technology & Society on Zoom!*

Thank you *for joining our community online!*

Our Annual Partners Make This Possible!

Awesome AF Advisory Board

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Brad Englert Advisory

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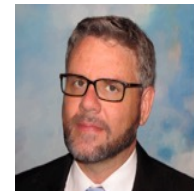*Austin Technology Council*

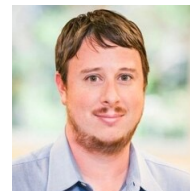**Fares Bagh**
Arm

Mike Ignatowski
AMD

Harold Ingersoll
Atchley & Associates

Mitch Jacobson
Austin Technology Incubator

Karl Popham
Austin Energy

Matt Sanchez
CognitiveScale

Marie Todd
Slalom Consulting

Michael Ward Jr.
Austin Urban Technology Movement

Jay Williams
Quantum Materials Corp

Thank you, Eric, and Welcome Fares!

Eric Hennenhoefer
VP Research at Arm

Fares Bagh
VP SOC and Solutions
Enablement at Arm

Austin Forum Events: Expert Presentations to Inform & Inspire

*We bring leaders, thinkers, builders, creators, and learners together to **connect, collaborate, contribute**!*

6:00-6:15   attendees can connect to Zoom session

6:15-7:30   presentation and Q&A

7:30-8:15   ~~networking~~ extended Q&A and discussion!

(We will have breakout-group networking for the August events)

What is your top hope/goal for AI helping humanity and society? (30 secs)

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16 17 18 19 20

21 22 23 24 25 26 27 28 29 🙂

More Great Content:

Austin Forum Upload & Austin Forum Update!

https://medium.com/@AustinForum

Check Out Our New Blogs

Medium.com/AustinForum

- **The Ongoing Question For Insight & Foresight (AI For Everyone)**

- **Tech Fostering Creativity During COVID-19**

Join the AF Slack Workspace

AustinForum.org/Slack

- Continue and deepen the conversation after Austin Forum events
- Find new opportunities for collaboration, mentoring, working, and more
- Promote local events and relevant Tech & Society opportunities

Interested in moderating a channel on our Slack Worskspace? Email us at info@austinforum.org

And now, our featured presentation...

Please:

- ✓ Ask questions via Zoom Q&A button (and please be respectful of our speakers and audience)

- ✓ Share key points via Twitter using our hashtag & handle: #AIatAF @AustinForum

- ✓ Learn, think, enjoy!
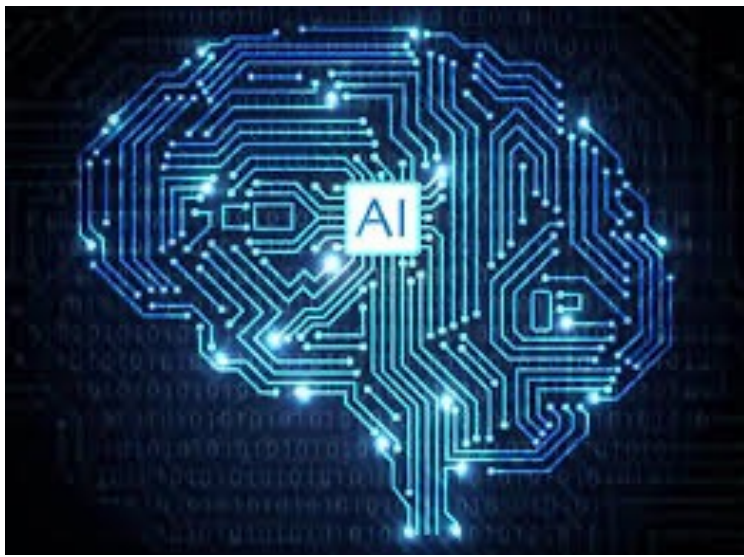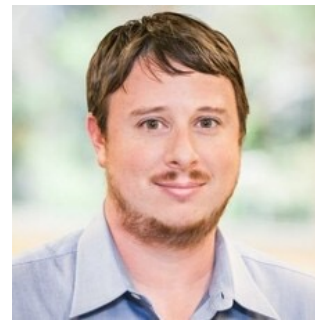
Humans Can't Discover, Interpret, and Act on All Available Insight Alone

HIGH

Human driven

Machine + Human driven

DATA VOLUME & COMPLEXITY

MACHINE AUGMENTED INTELLIGENCE

BUSINESS INTELLIGENCE

REPORTING

HUMAN LIMIT

MAINFRAME COMPUTING

WEB & DISTRIBUTING COMPUTING

MOBILE & CLOUD COMPUTING

LOW

1960-80S

1990-2010

NOW

HIGH

BUSINESS VALUE

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THE TRUSTED AI COMPANY
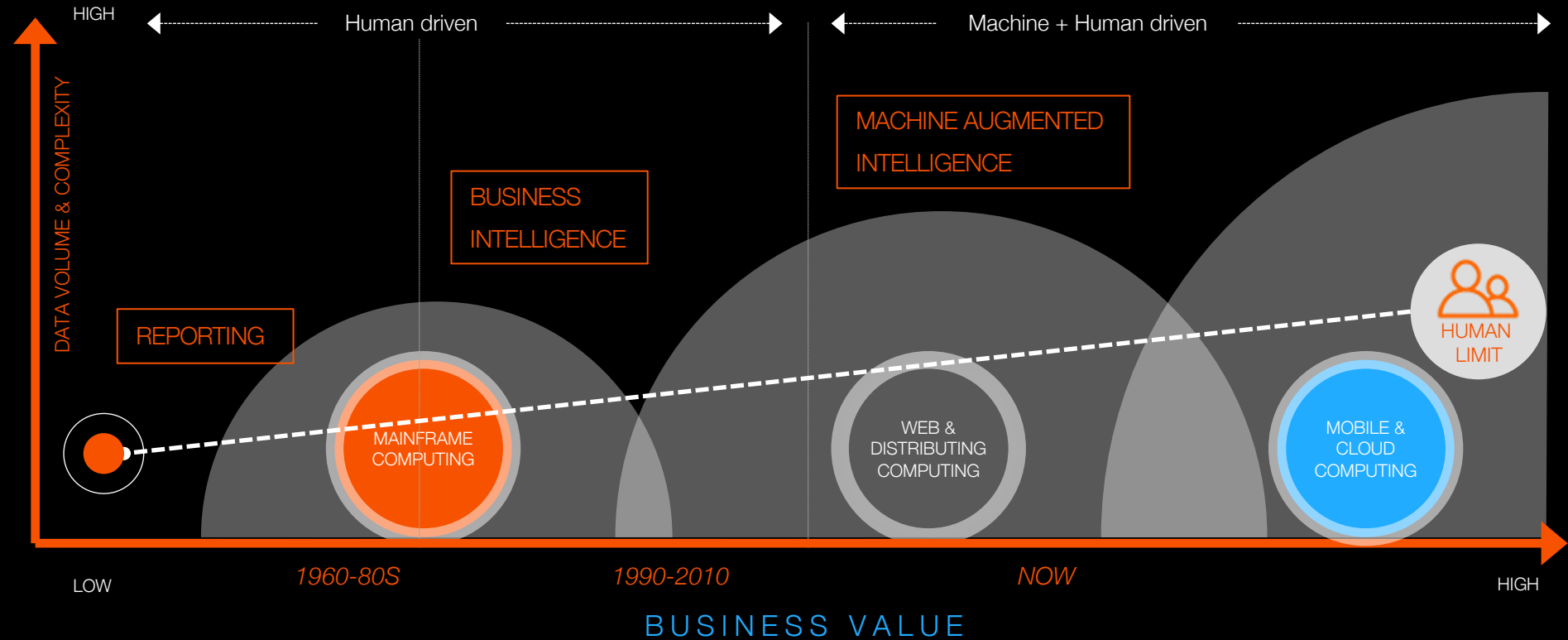
Let's dispel some AI Myths

1. **Over hyped potential about "AI Magic"**
   Confusion about Intelligence vs. Mind vs. Consciousness, Business model innovation vs Tech innovation

2. **AI is Machines > Humans**
   Narrow view about replacing humans vs about pairing man + machine for augmenting human decisions

3. **AI = ML or NLP or Data Science**

   AI needs far more capabilities than just Machine Learning or Natural Language Processing

4. **Breakthroughs in AI will come fast and furious**
    Technology will accelerate but not like Hollywood projects. Vertical AI most ROI for the foreseeable future
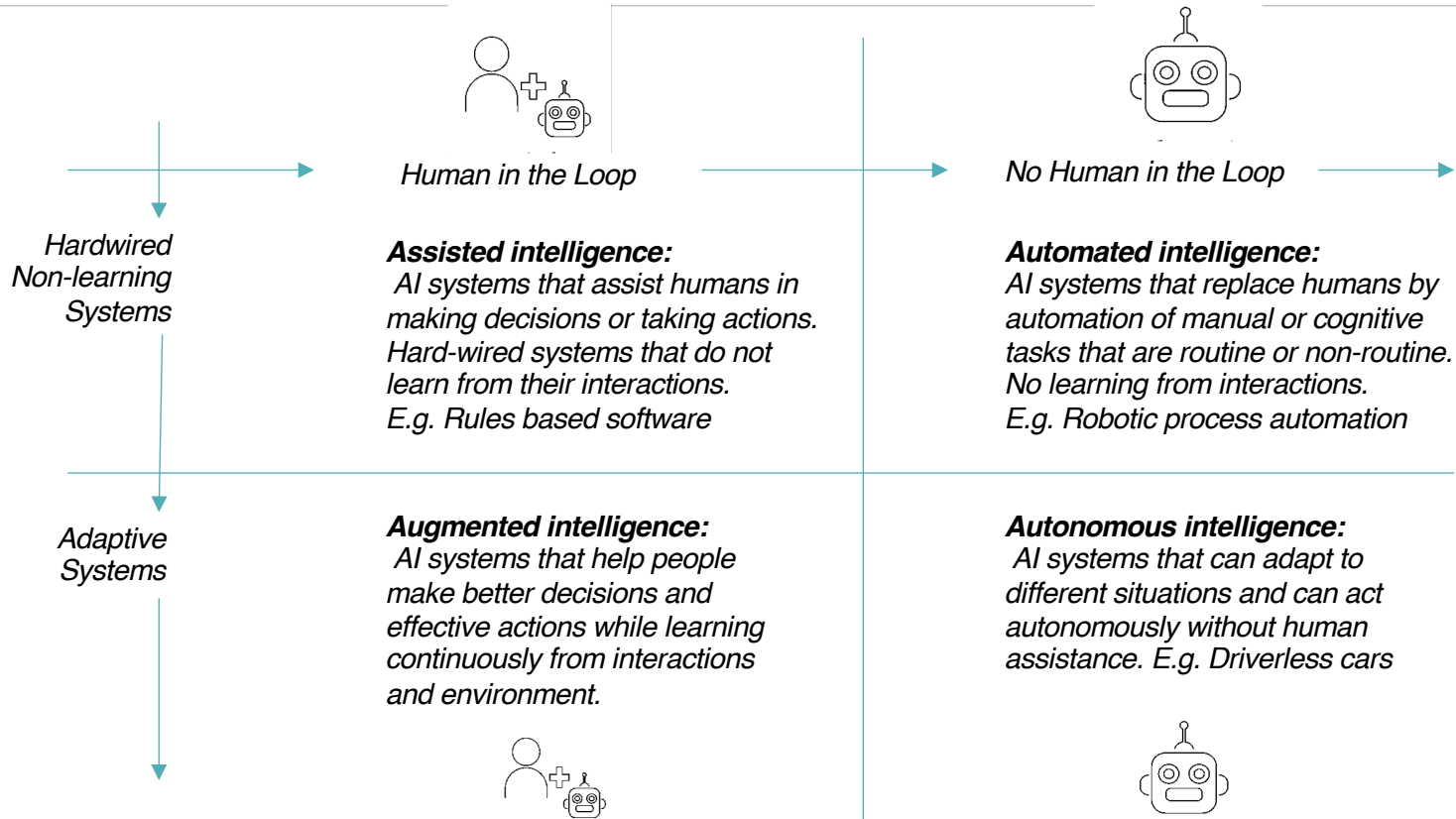
5. **Technology alone will solve all problems and overnight**
   It's not just about Technology but also about data, industry, business models, and org change management

6. **AI is only for big tech companies, banks, etc.**
   Much like e-business, AI powered businesses will require workforce upskilling, IT-Business alignment

AI is not one thing, it takes different forms

	Human in the Loop	**No Human in the Loop**
Hardwired Non-learning Systems	**Assisted intelligence:** AI systems that assist humans in making decisions or taking actions. Hard-wired systems that do not learn from their interactions. E.g. Rules based software	**Automated intelligence:** AI systems that replace humans by automation of manual or cognitive tasks that are routine or non-routine. No learning from interactions. E.g. Robotic process automation
Adaptive Systems	**Augmented intelligence:** AI systems that help people make better decisions and effective actions while learning continuously from interactions and environment.	**Autonomous intelligence:** AI systems that can adapt to different situations and can act autonomously without human assistance. E.g. Driverless cars

What is the market for AI?

VERTICAL AI MARKET
AI Verticals
Industries E.g. Uber

ENTERPRISE AI MARKET
AI systems to drive efficiencies, processes, improve personal lives

DATA & ML TOOLS MARKET
Data Prep and Machine Learning tools and compute for developers

Customer Engagement
improve customer acquisition, engagement and loyalty

Compliance & Risk
radically reduce cost, time and effort around compliance

Service and Support
Delight customers while reducing cost of support

Human Capital
Improve talent lifecycle management

Product Development
fuel conceptual product and services breakthroughs

Supply Chain
Manage supplier risk, improve sourcing costs, business agility

Finance
Review and manage financial position of the company in real time

Cognitive Business

Sales Teams · Compliance Teams · Support Teams · HR Execs · Product Teams · Supply Teams · Finance Teams

Gartner: Business value created by AI will reach $3.9T in 2022
Enterprise AI Software Market will reach $126 billion by 2025

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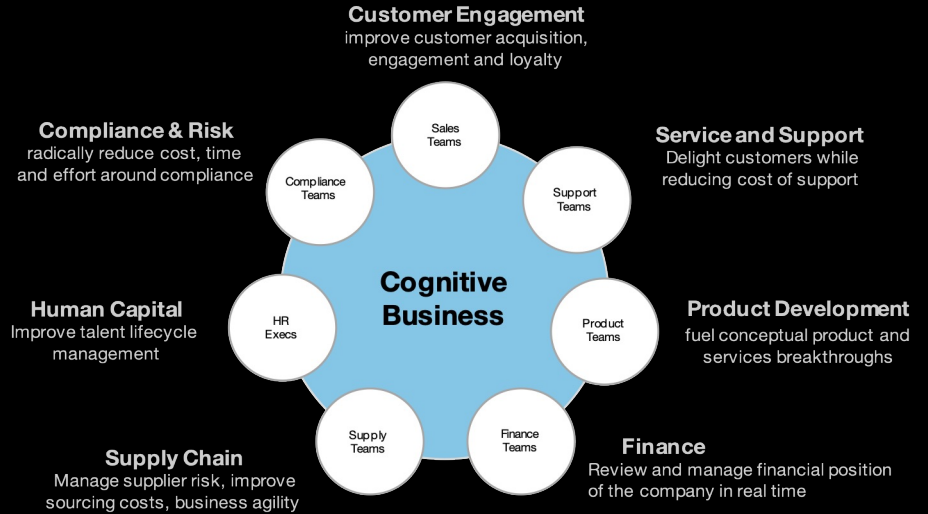
Current Examples of AI Being Used to Improve Human Health

Dave DeCaprio, ClosedLoop.ai 7/21/2020

Genomics and Natural Language Processing

- 19.5 hours
- Genetic associations
- Natural Language Processing on Clinical Notes

- Real test diagnosis cured an 8 day old baby with constant seizures

The San Diego Union-Tribune

$1.85 PLUS TAX

sandiegouniontribune.com — TUESDAY • FEBRUARY 13, 2018

RADY CHILDREN'S INSTITUTE SETS DNA SEQUENCE WORLD RECORD

Step toward faster diagnoses of puzzling, threatening illness

BY PAUL SISSON

It took 13 years to build the first full set of genetic blueprints for the human race by sequencing the DNA inside our cells that governs everything from eye color to risk of debilitating disease.

But a team at Rady Children's Institute for Genomic Medicine, working closely with homegrown sequencing sensation Illumina Inc., just proved it's possible to get the job done in just 19.5 hours.

On Feb. 3, Guinness World Records documented the technological feat, which could provide quicker diagnoses for kids with puzzling and immediately life-threatening illnesses and hasten the inevitable moment when genetic analysis enters the mainstream.

EDUARDO CONTRERAS U-T

Clinical laboratory scientist Sarah White pulls a flow cell from a new genetic sequencer at Rady Children's Institute for Genomic Medicine.

"I think the speed they were able to achieve was a ground-breaking moment for genomics," said Ramlah Nehring, vice president of clinical and science affairs at San Diego's NAVICAN Genomics.

Nehring, who holds a doctorate in molecular biology, was one of several unaffiliated genetic experts Guinness required Rady to invite to the record-breaking session to observe and make sure the results produced by the institute's process were medically and scientifically valid.

The achievement will be announced at a pair of widely attended genomics conferences in San Fran-
SEE DNA • A7

Computer Vision

- First FDA approved deep learning model

- Automated segmentation of MRIs

- Many potential uses
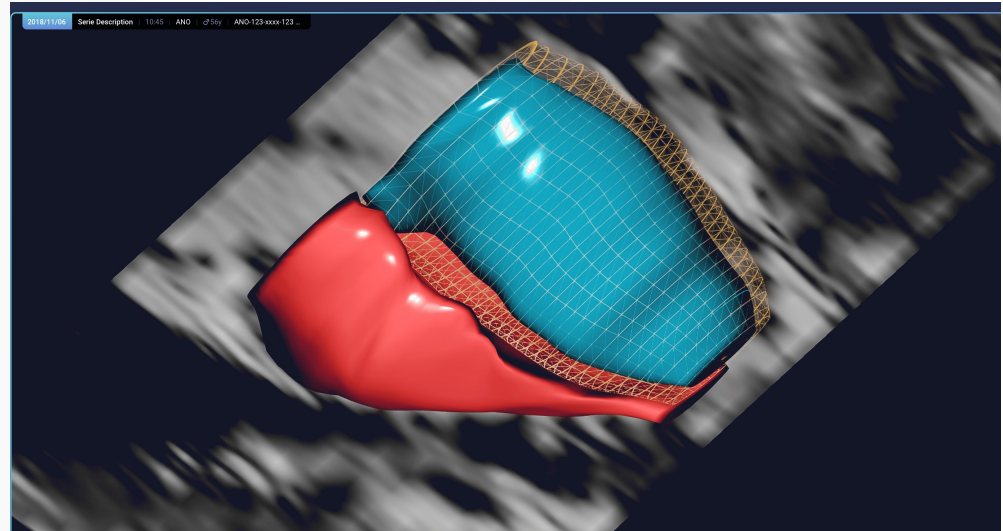
COVID-19

- Identify individuals likely have complications if they contract COVID-19
- Used on over 10 million people in the first 6 weeks

BECKER'S HEALTHCARE | CARDIOLOGY VIRTUAL FORUM   SEPTEMBER 2020   REGISTER NOW

E-Newsletters | Conferences | Virtual Conferences | Webinars | Whitepapers | Podcasts | Print Issu

Artificial Intelligence | Consumerism | Cybersecurity | Data Analytics | Digital Marketing | Digital Transform

Illinois ACO deploys AI to identify high risk COVID-19 patients

Mackenzie Garrity - Monday, March 16th, 2020 Print | Email

Share | Tweet | Share 0

Chicago-based Medical Home Network's Accountable Care Organization has implemented artificial intelligence to help identify patients most at risk for diagnosing COVID-19.

The ACO teamed up with ClosedLoop.ai to introduce the AI-based predictive model. The AI analyzes patient demographics, social determinants of health, claims and clinical activity to determine which patients need the most outreach.

"We want to identify what we refer to as the 'socially isolated' or people without nearby friends or family so

How vulnerable are you or a loved one to serious illness from COVID-19.

4.3X ELEVATED VULNERABILITY

You are 4.3 times more vulnerable to severe complications from COVID-19

CDC guidelines highlight that older adults and people of any age with certain underlying medical conditions might be at higher risk for severe illness from COVID-19.

Tell me more

Your Risk → ELEVATED

NORMAL

Avg. Person No Conditions

GET STARTED

- Open Source model from ClosedLoop.ai
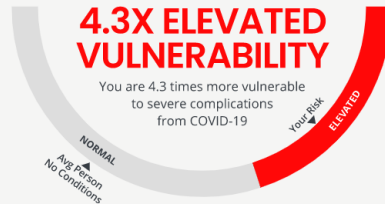
$1 Million Medicare AI Challenge

CMS AI Health Outcomes Challenge

### Accelerate the future of health care with AI

CHALLENGE DETAILS

- TOTAL CASH PRIZES OFFERED: $1,650,000
- TYPE OF CHALLENGE: Analytics, visualization, algorithms
- SUBMISSION START: 03/27/2019 02:00 PM ET
- SUBMISSION END: 06/18/2019 05:00 PM ET

Department of Health and Human Services - Centers for Medicare and Medicaid Services

Use AI to predict unplanned hospital and SNF admissions and adverse events for Medicare beneficiaries

Develop innovative strategies and methodologies to explain the AI-derived predictions to front-line clinicians and patients to aid in providing appropriate clinical resources

Intelligent automation and AI are being woven into every app, cloud workload and data center.

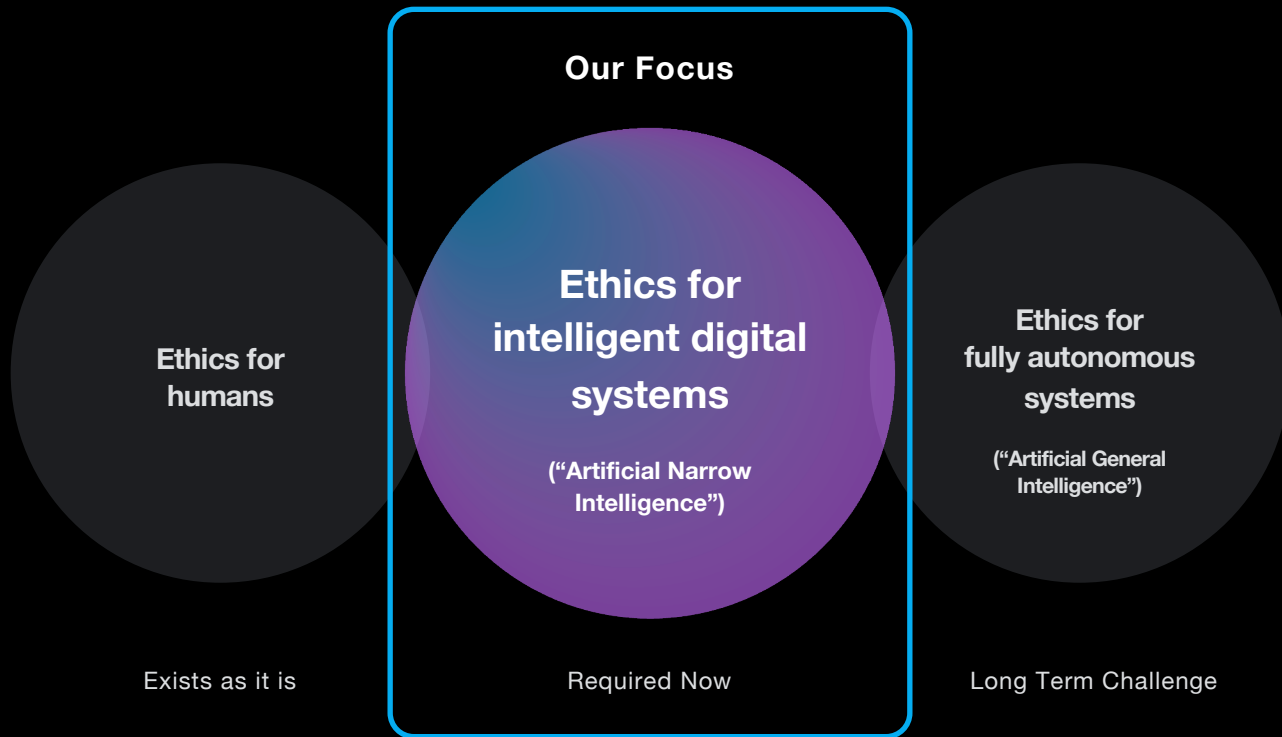How do we know we can trust these intelligent systems?
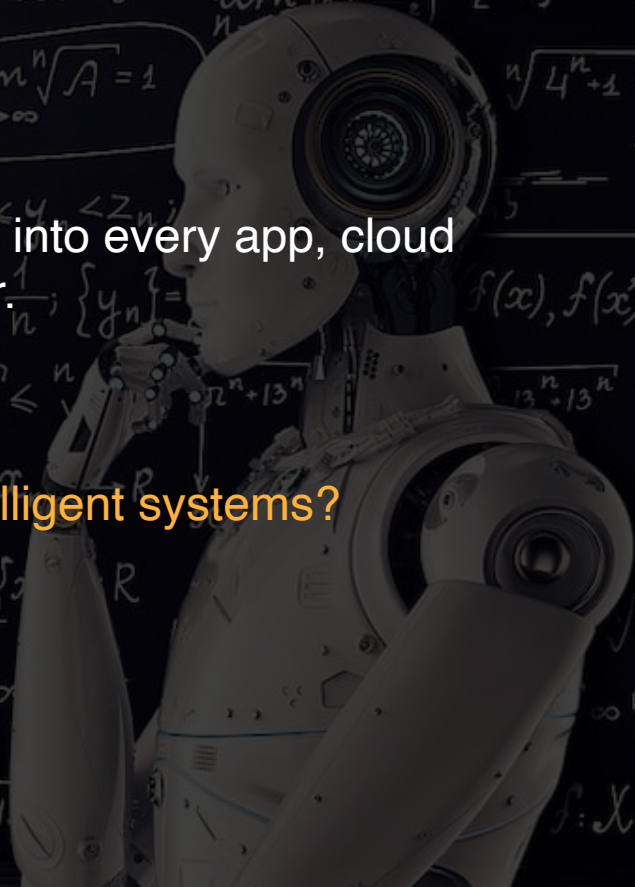
A heightened awareness of ethical issues in AI

Not addressing ethical issues can damage the reputation of your brand

- 50% of consumers believe they have felt the impact of an ethical issue

- 76% of consumers advocate regulations on the use of AI

- 44-point increase in NPS for organizations seen as using AI ethically

Lack of Trust Costs Brands $2.5 Trillion Per Year Globally

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THE TRUSTED AI COMPANY

Our Focus

Ethics for humans

Ethics for intelligent digital systems

("Artificial Narrow Intelligence")

Ethics for fully autonomous systems

("Artificial General Intelligence")

Exists as it is

Required Now

Long Term Challenge

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Who is working on AI ethics?

Heat Map of Poorly Designed AI
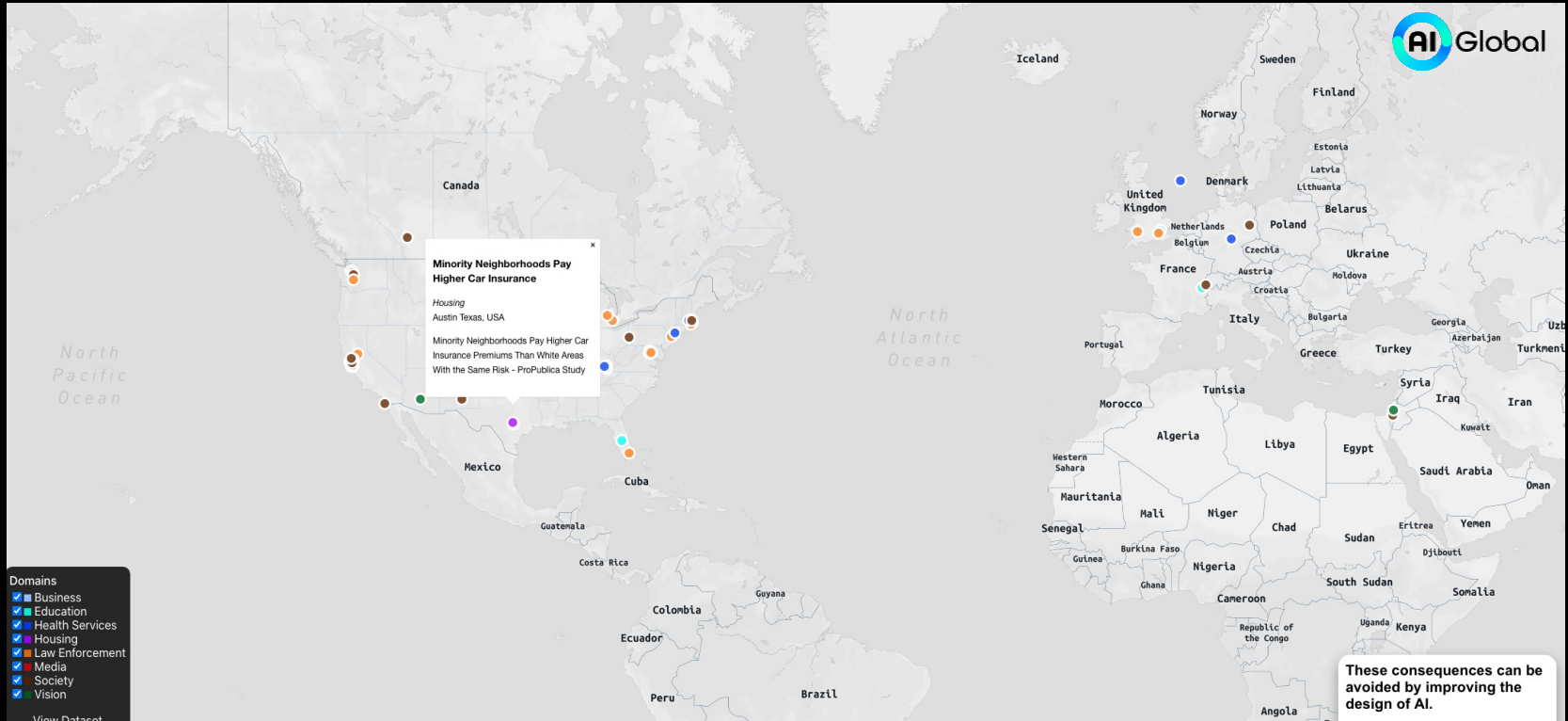
Machine Learning - AI in the real world

- Machine learning is all about translating concepts from the real world into math problems that can then be solved using various techniques

- The solutions we create are called models, and we can use them to make decisions or predictions about the future

- Most models are learned by giving them data that represents examples from the real world where the ***correct answer*** is provided (supervised learning)

Can we trust AI? Key questions to consider

How do these models make a prediction? Does this align with our expectations as customers?

What data attributes are being considered and does that make sense?

Is the data used to train these models correct?

Are the data and models free from unwanted bias?

Are their privacy issues with the data itself or leaked through the model?

Can the model be spoofed or otherwise easily fooled? What does it mean to test/verify an AI model?

What do we mean by "trust"?

What is Zero Trust Security?

- Organizations should not automatically trust anything *inside* or *outside* its perimeters

- Verify anything and everything trying to access systems (users, devices, etc.)

- Grant only the least privilege possible for all requests

- Actively inspect access logs using advanced analytics where possible to spot abnormal activity

"Don't trust, verify!"

- Coined in 2010 by John Kindervag, Principal Analyst at Forrester

- Widely considered as the best defense against data breaches and other cyberthreats

Extending Zero Trust to AI

- Organizations should not automatically trust data or machine learning models *inside* or *outside* its perimeters

- Verify all decisions that use data or machine learning during development and after deployment

- Select the safest model possible for all decisions or predictions (may need multiple versions of a model suited for different scenarios)

- Actively inspect data quality and model predictions to spot deviations from baseline ("data drift" and "model drift")

6 Key Trust Factors for AI

Effectiveness
Ensure AI systems and models are continually generating optimal business value

Explainability
Enable human users to interpret, understand, and explain machine generated predictions

Data risks
Uncover data drifts, detect data poisoning, and ensure data validity and fit

Bias and fairness
Uncover bias in the underlying data types, data sets, ML model, and AI development process

Compliance
Align AI development to be in line with current and emerging local and global regulations

Robustness
Detect adversarial attacks that disrupt or alter long term model performance

The Case for Zero Trust AI in the Banking Industry

1

Gender discrimination in credit limit decisions for cards

The Apple Card Didn't 'See' Gender—and That's the Problem

The way its algorithm determines credit lines makes the risk of bias more acute.

**Hidden Biases
Lack of Explainability
Regulatory Risk**

Fair Credit Reporting Act (FCRA)

2

Debt collection biased against the vulnerable

Bad practice by debt collection firms is creating more problems for people who are struggling, and who may be in vulnerable circumstances, the regulator has warned

**Hidden Bias
Lack of Explainability
Regulatory Risk**

Financial Conduct Authority (UK)

3

Systemic Lending Biases in COVID-19 Small Business Programs

As many as 95 percent Black-owned businesses stood no chance of securing a program loan. Other communities of color were similarly likely to be shut out as well.

CLOSED

**Reputational Risk
Legal Risk**

Unfair Business Practices, Fraud (US)

Zero Trust AI: How it works

For example, if a user was denied a loan by a machine learning model, an example counterfactual explanation could be: "Had your income been $5,000 greater per year and your credit score been 30 points higher, your loan would be approved."

I would like to apply for a loan

WHY! ?
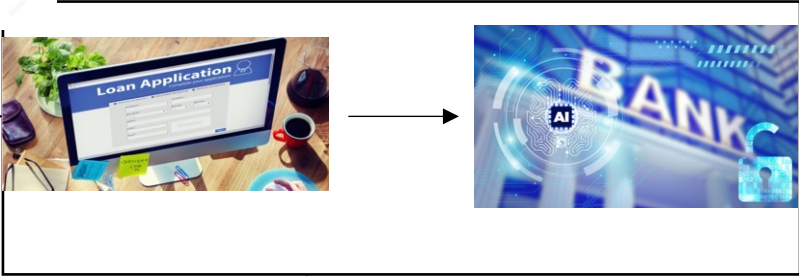
Got it!

Person	Feature(s)	Original	Counterfactual
1	Education	12th	Bachelors
	Occupation	Tech-suppt	Exec-managerial
1	Hrs-per-week	50	70
	Workclass	Local-gov	Private

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AI Systems Must Comply With Localized Version of Ethics

Colorado Dept of Regulatory Agencies – Rights regarding pre-auth and appeals

New York Department of Financial Services – Unfair Claim Settlement Rules

Fair Claims Settlement Practice Regulations (CA Code of Regulations, Title 10)

California Consumer Protection Act

Virginia Human Rights Act

Nationwide:
HIPAA (Security & Privacy)

Compliance Scope
- Anthem States
- Affiliate States

Texas Insurance Code, Title 5 - Prohibited Discrimination

Florida Statues for Unfair methods of competition and unfair or deceptive acts or practices

Small sample of the dozens of different federal, state, and local statues that may apply

AI Trust Index: A Common Language for Measuring AI Trust

Model Score from Certifai Engine

| ATX Score | 74.9 | Accuracy | 85.5 | Fairness | 87.3 | Robustness | 28.9 | Explainability | 98.3 |

AI Global

Policies / Rules for each State

Rule BF1 - Link to execute the rule (docker container? Or A simple formula?)			
< 60	Determined by the rule BF1 70-79	80-89	90-100
Rule EXP1 - Link to execute the rule (docker container or a simple formula?)			
<20	Determined by the rule EXP1 between 40 and 60	between 60 and 80	> 80
Rule ROB1 - Link to execute the rule (docker container or a simple formula?)			
< 40th percentile	Determined by the rule ROB1 41 - 69th percentile	71st - 90th Percentile	91-100 Percentile
Rule DAT1 - Link to execute the rule (docker container or a simple formula?)			
< 40th percentile	Determined by the rule DAT1 41 - 69th percentile	71st - 90th Percentile	91-100 Percentile
Rule CMP1 - Link to execute the rule (docker container or a simple formula?)			
<20	Determined by the rule CMP1 40 and 60	between 60 and 80	> 80
Rule EFF1 - Link to execute the rule (uocker container or a simple formula?)			
< 60	Determined by the rule EFF1 70-79	80-89	90-100
Rule WT1 - A Vector of weightage % for each scoring dimension			

Scores for each State

| ATX Score | 81.2 | Accuracy | 85.5 | Fairness | 74.2 | Robustness | 35.2 | Explainability | 92.2 |

CognitiveScale

Engaging key stakeholders in building Trusted AI

IT

Product

Cyber
Trust

Data & Models

Customers

Compliance

1. AI, Data teams, IT Experts
- How can I explain my predictions?
- Have I been unfair to someone or a group?
- How do we ensure our AI is not easily fooled?
- How do we automate risk detection and scoring?

2. Product and Marketing Executives
- How do we explain AI outcomes to users?
- How might we use AI to build customer trust?
- How can we ensure AI respects data privacy?
- How to ensure AI does not perpetuate bias?

3. Consumers and Employees
- Will AI protect my privacy?
- Will AI be transparent and clear?
- Will AI be fair and bias-free?

4. Compliance and Risk Executives
- What new risks are we introducing?
- How might we run afoul of regulations?
- How might AI harm our brand and customer trust?

Peggy
Data Scientist

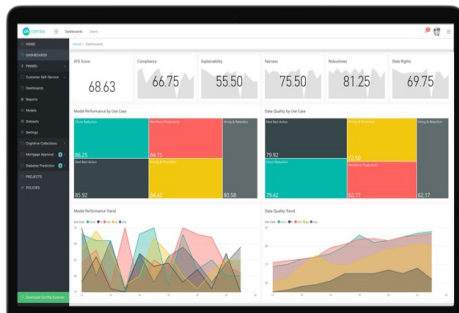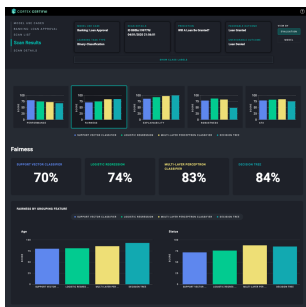**Peter**
Compliance Officer

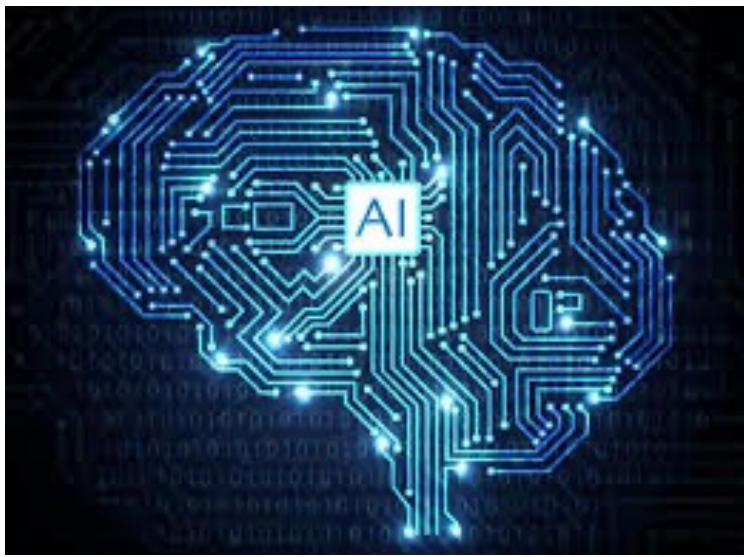**Sally**
Customer

Oscar
Data Owner

Adam
Business Owner

Jenny
Head of Operations

CognitiveScale

Resources to Learn More

- Towards Trusted AI: https://medium.com/towardstrustedai

- Try Cortex Certifai Free! https://www.cognitivescale.com/certifai/

- AI Global: https://ai-global.org/

- World Economic Forum: https://www.weforum.org/agenda/2020/01/8-ways-to-ensure-your-companys-ai-is-ethical

- Ethics & Algorithms Toolkit: https://ethicstoolkit.ai/

- PwC Responsible AI Toolkit: https://www.pwc.com/gx/en/issues/data-and-analytics/artificial-intelligence/what-is-responsible-ai.html

- EY Trusted AI Platform: https://www.ey.com/en_us/consulting/trusted-ai-platform

Thank You

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**Q&A
for
AI & How It Will Impact
Humanity & Society**

Byron Reese
Author, entrepreneur

Matt Sanchez
CognitiveScale

Jean-Leah Njoroge
Dell Technologies

Dave DeCaprio
ClosedLoop

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Join Us for Great Events in 2020!

- **Tech & Racial Injustice** – Aug 4

- **Racial Equity in Tech** – Aug 18

- **Tech Startups & Innovation** – Sept 1

- **Online Worlds** – Sept 22

- **National security and defense** – October 6

- **Quantum Computing** – November 10

- **Tech for Social Good** – December 1

Save the date!

And for a different kind of fun …

Friday night, 8PM, online via YouTube Live, and **free**!

Great music, and lots of tech—multi-cam, drone, direct mixing board integration, etc.

100% of tips support musicians in need via the SIMS Foundation! You can tip via FB (now) or SMS (during)

www.belldiver.com/vapor-launch

Join the Austin Forum Slack Workspace

1. Go to: www.austinforum.org/slack

2. Click "Join the Slack channel"

3. Enter your email address

4. Check your email to confirm Slack invitation

5. Enter your name and click "Create Account"

6. You're in!

Our Annual Partners Make This Possible!

Help Others Get Connected during COVID-19:
Donate Your Devices to **Austin Pathways!**

Our residents need these devices to learn, work and be well remotely!

Therefore we can pick them up **SAFELY** from you, safely refurbish and deliver to residents

All you need to do is call **512-767-7832** or email **info@austinpathways.org!**

We collected 250+ devices 2018-19—only 38/300 donated in in 2020, so please help!

Join us to learn, share, discuss!!

Please share the upcoming events with your friends and colleagues!

What are you looking forward to this week?

1   2   3   4   5   6   7   8   9   10

11 12 13 14 15 16 17 18 19 20

21 22 23 24 25 26 27 28 29 🙂

Grab a drink and them come back
for live Q&A and discussion!