AUSTIN FORUM

ON TECHNOLOGY & SOCIETY

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Austin Forum on Technology & Society
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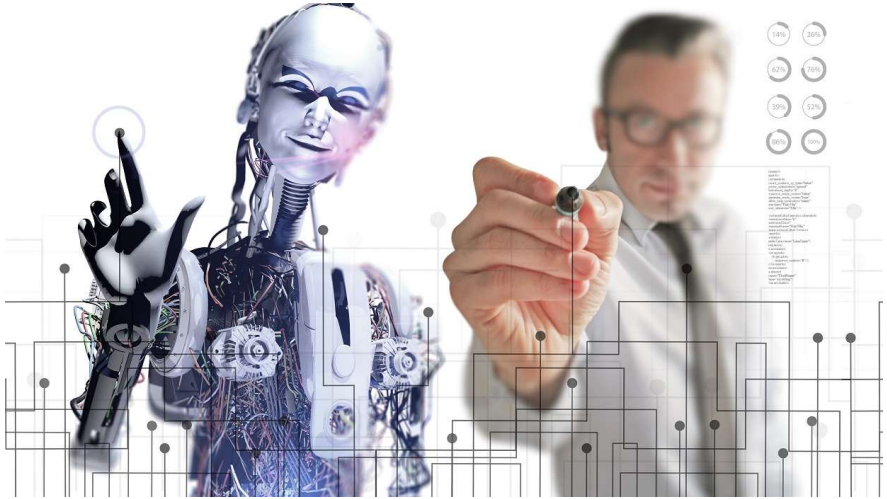
online!

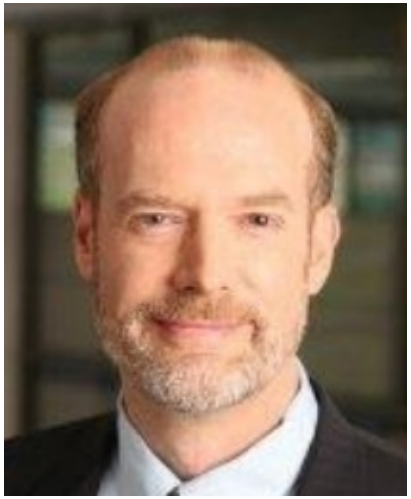


AI and the Future of Work

October 20, 2020

Online (Zoom)

Sherri Greenberg
The University of Texas at Austin



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A UT Grand Challenge

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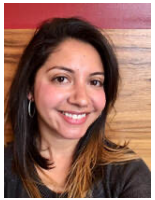

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Brad Englert Advisory

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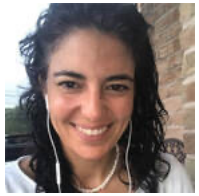

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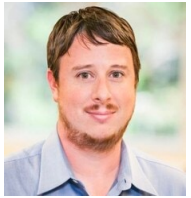

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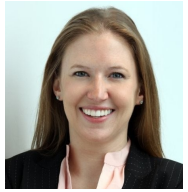
CognitiveScale



Marie Todd
Slalom Consulting

Michael Ward Jr.
Austin Urban Technology Movement

Jay Williams
Quantum Materials Corp

Welcome Elizabeth & Janice!

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
6:15-7:15ish	**presentation**
7:15-8:00	extended Q&A and discussion!

What is your favorite AI tool that helps you work (or learn, play, shop…)?

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

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Austin Forum Upload & Austin Forum Update!

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AF Upload Season 3 Has Begun!

AF UPLOAD

Season 3, Episode 1 – SXSW Is Coming Back!
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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 workspace? Email us at info@austinforum.org

Help us share the Austin Forum goodness with everyone!

Remember to tweet!
#worksmartAF @AustinForum

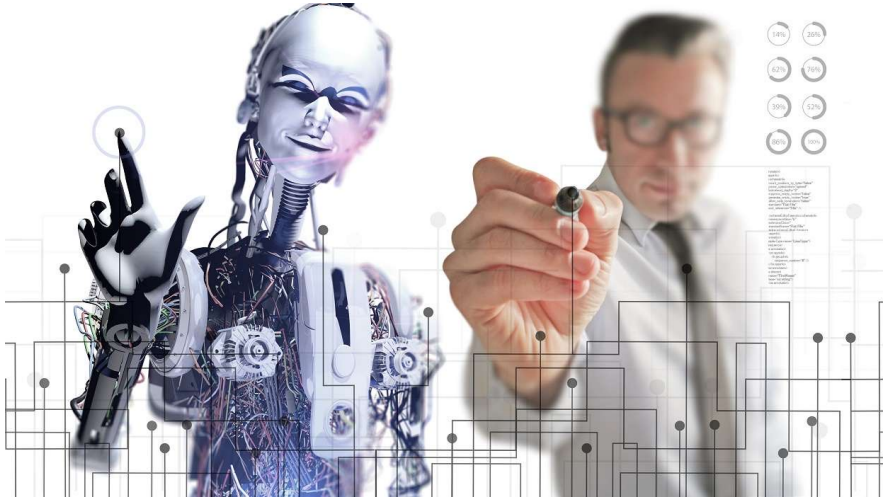
Questions for speakers?

Use Q&A in the Zoom client (not the Chat—use that for self-intros, adding information, etc.)

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: #worksmartAF @AustinForum
- ✓Learn, think, enjoy!



AI and the Future of Work

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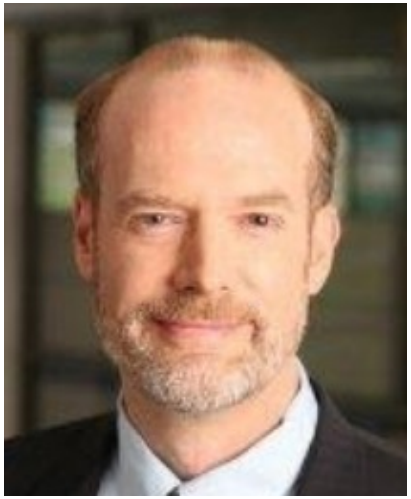

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GOOD SYSTEMS

A UT Grand Challenge

TEXAS
The University of Texas at Austin

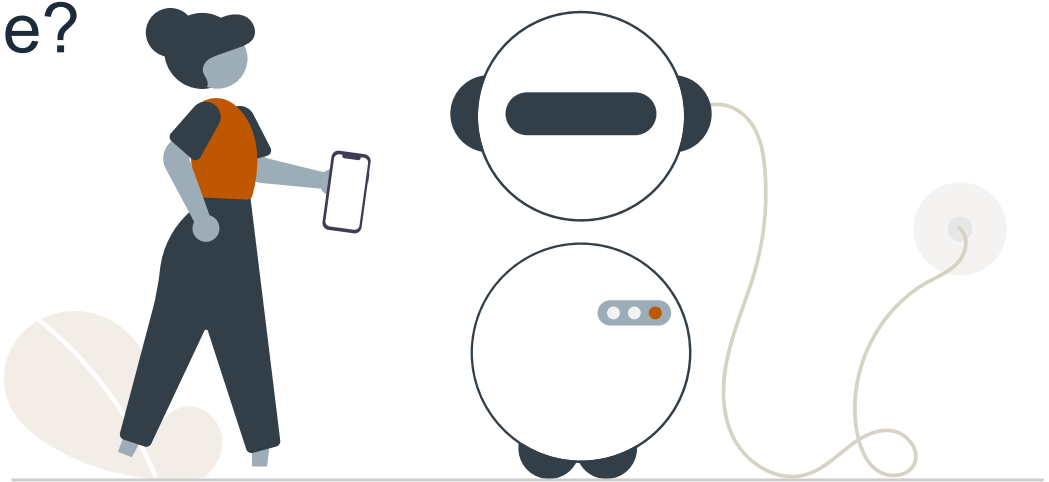
AI & The Future of Work: A Presentation for the Austin Forum on Technology and Society

October 20, 2020

SHERRI GREENBERG
Professor of Practice, LBJ School of Public Affairs, The University of Texas at Austin

The Future of Work

- What jobs will there be?
- How will we work?
- Where will we work?
- Social and political implications



AI/ML Overview

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Simple definitions

AI: the capability of a machine to imitate intelligent human behavior

ML: the capability of a machine to improve its own performance

AI/ML is a new paradigm for software development

- Classical Computing
  - Deterministic
  - Structured
  - Predictable
  - Explainable
- AI/ML
  - Probabilistic
  - Finds structure where humans cannot
  - Can predict events that humans cannot
  - Deep Neural Nets (most often used in advanced applications) is nearly impossible for humans to understand or explain

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Machine Learning Types

- Supervised Learning
  - Training data given to a model that is already labeled with the expected answers
- Unsupervised Learning
  - Training data without labels given to an algorithm with the goal of discovering patterns or collections
- Reinforcement Learning
  - Draws from behaviorist psychology whereby a model is rewarded when it produces successful outcomes (similar to Alpha GO and Microsoft Tay)

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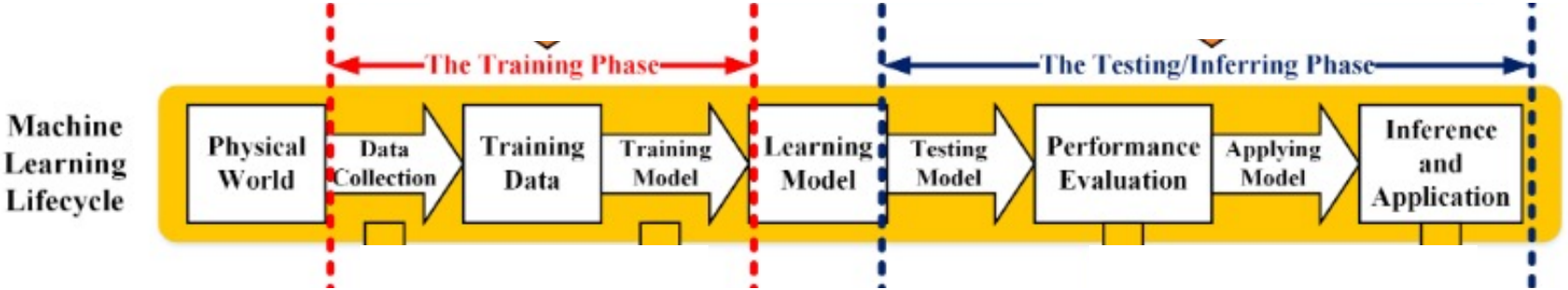
Overview of Machine Learning:



Liu, Q., Li, P., Zhao, W., Cai, W., Yu, S. and Leung, V.C., 2018. A survey on security threats and defensive techniques of machine learning: A data driven view. *IEEE access*, *6*, pp.12103-12117.

ML Reinforcement Learning

- Agent: The program you train
- Environment: The context that your model will operate within and take action
- Action: The action taken by the agent which change the status of the environment
- Rewards: The evaluation and feedback about the action
- Examples: Microsoft Tay Chatbot and DeepMind Alpha Go

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ML Vulnerability Examples

- Classifiers bias (ML can take bias to scale)
  - Selection bias: data samples selected that underrepresent target population
  - Automation bias: training feed with automated systems
  - Reporting bias: classifier event frequency doesn’t represent real-world
  - Group attribution bias: tendency to generalize about individuals to an entire group to which they belong
- Attacks on ML (successful attacks can be hard to predict)
  - Attacks in production
  - Attacks during development

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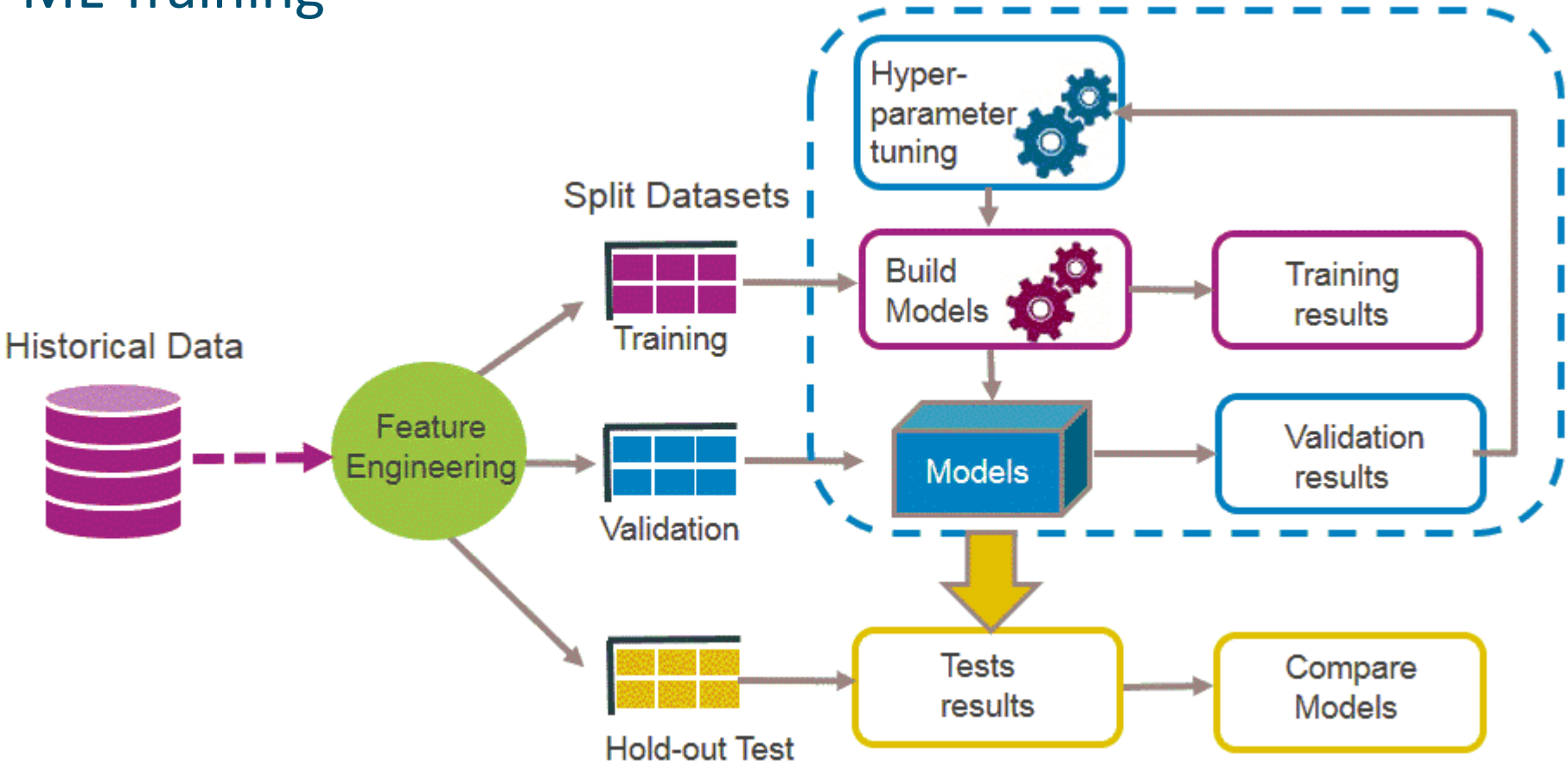
ML Training



https://www.capgemini.com/2016/05/machine-learning-has-transformed-many-aspects-of-our-everyday-life/

ML Training Detect Cats/Dogs

Historical Data

Feature Engineering

Split Datasets

Training

Validation

Hold-out Test

Hyper-parameter tuning

Build Models

Training results

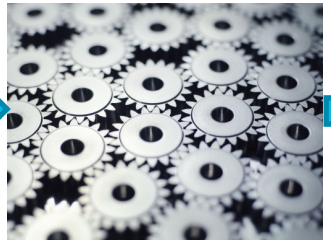
Models

Validation results

Tests results

Compare Models

Input sample during production: Bias error



Match	Probability Match
Cat	30%
Dog	40%
?	30%

DOG

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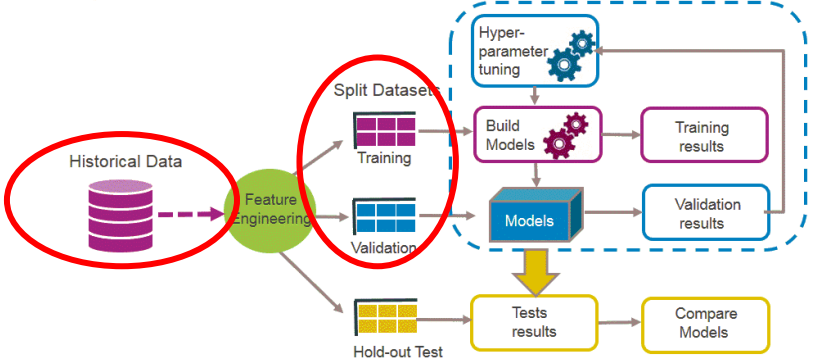
Poisoning Attacks



- Attacks during the training phase
- Injects malicious data that is meant to change the classifier in favor of the attacker's goals

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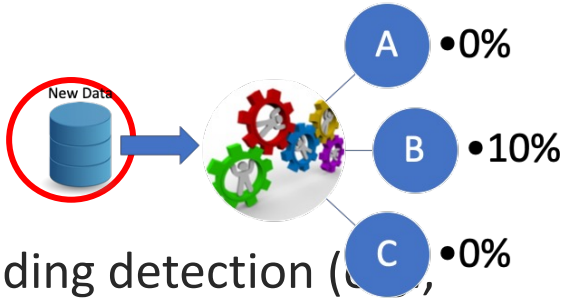
Evasion Attacks



- Often used in information security domains by evading detection (e.g., malware, spam)
- Distorts samples so that they are not detected as attacks when they should be

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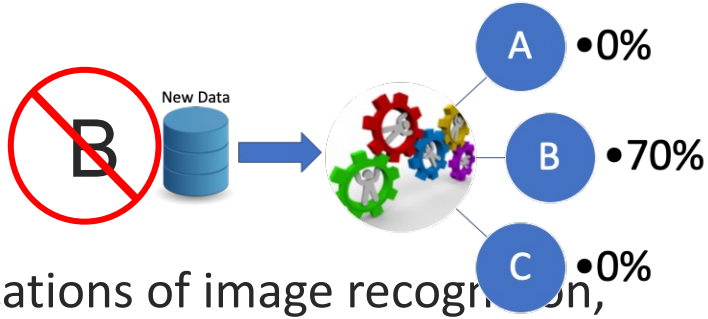
Impersonation Attack



- Imitates samples from victims often in applications of image recognition, malware detection, intrusion detection
- Injects malicious data that is meant to classify original samples with different labels from their impersonated ones – e.g., spoofing identify for access control
- Examples: facial recognition system impersonation, unrecognizable speech recognized by models, DNN attacks on self-driving cars, Deep Fake

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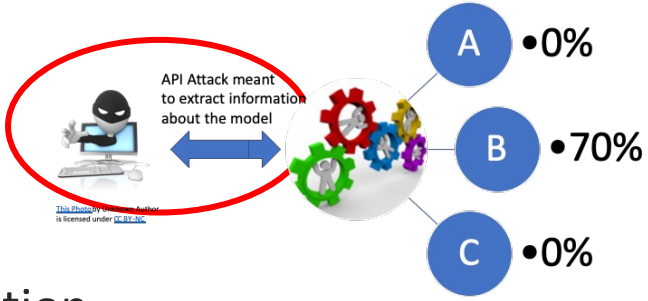
Inversion Attack



- Exploit ML API to extract confidential information
- Can extract information about the ML model
- Can extract personally identifying information (membership attack)

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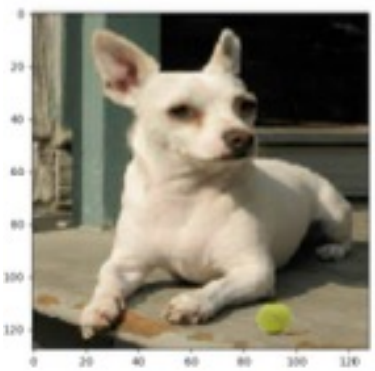
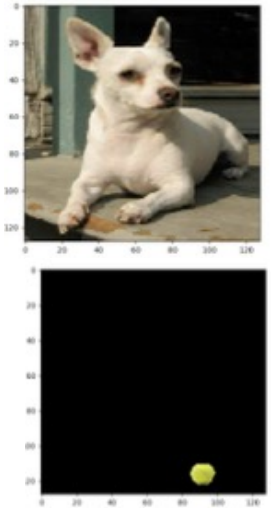
Deep Neural Net Back Door Attack

- Contaminate training data with a trigger
- Use the trigger during production to force model to pre-determined decision





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What jobs will there be?

- Jobs lost
  - Call Centers
  - Drivers
  - Doctors
  - Lawyers

- Jobs gained
  - Technicians
  - Data scientists
  - Telehealth

How will we be hired and fired?

Who will hire us and how?

Who will evaluate our work and performance, and how?

How will we work?

- Broadband as a utility
- Workforce and education
  - Pipeline
  - Continuing ed
  - Retraining
- Expect and adapt to change

Where will we work?

- Home/Office/Hybrid
- Spatial planning at home and the office
- Geography and remote

What does ML/AI mean for the future of work?

- Employment
  - Scanning resumes using ML – does unintended bias screen out qualified individuals? How would you know?
- How do we measure performance in a work-from-home environment?
  - Analyze social graphs and interactions
  - Analyze recorded video in meetings for contribution and interaction?
  - Sentiment analysis of messages, emails

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Technical AI/ML Recommendations

1. Make sure you need to use AI/ML
2. Engage AI/ML experts and domain experts
3. Make sure your data is accurate, clean, and represents your population
4. Judiciously develop your AI/ML model
5. Validate its performance
6. Monitor in production

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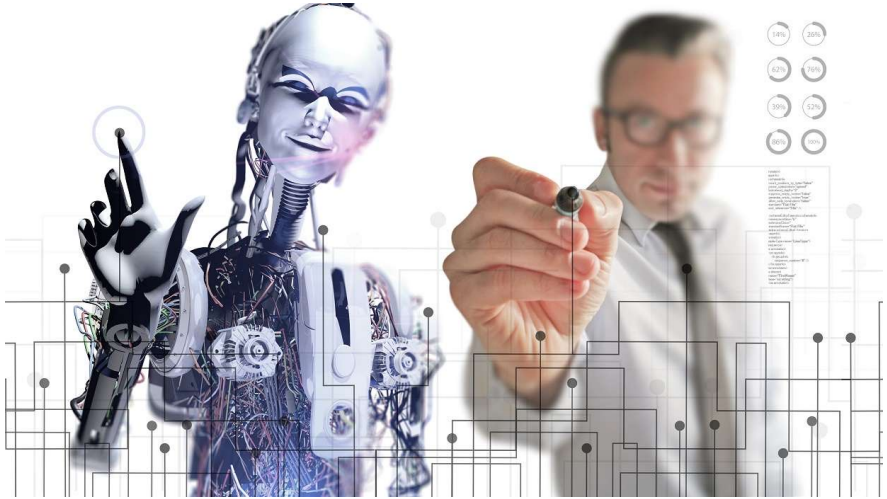
Social and political implications

- Childcare
- Wages and Universal Basic Income
- Daily life
- Public policy

Please join us:

GoodSystems.utexas.edu
@UTGoodSystems

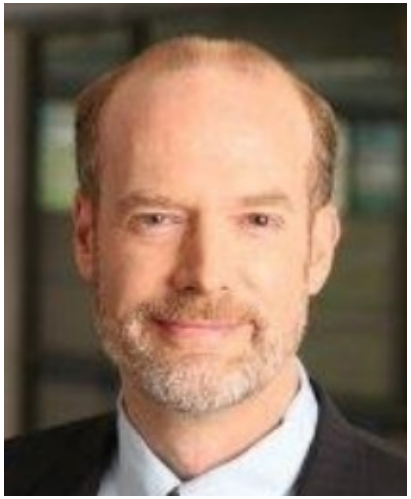
Sherri R. Greenberg
Professor of Practice, LBJ School of Public Affairs
Research Director, Good Systems Future of Work
The University of Texas at Austin
srgreenberg@austin.utexas.edu



Q&A
for

AI and the Future of Work

Sherri Greenberg
The University of Texas at Austin



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Join Us for More Great Events

- **Quantum Computing** – November 10
- **Online Worlds and the Future of Gaming** – November 17
- **Tech for Social Good** – December 1
- **Tech Trends for 2021 (and Beyond)** – January 5, 2021
- **Tech & Relationships** – February 2021
- **Tech & Food** – also February 20201

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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!

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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!**

Join us to learn, share, discuss!!

Please share the upcoming events with your friends and colleagues!

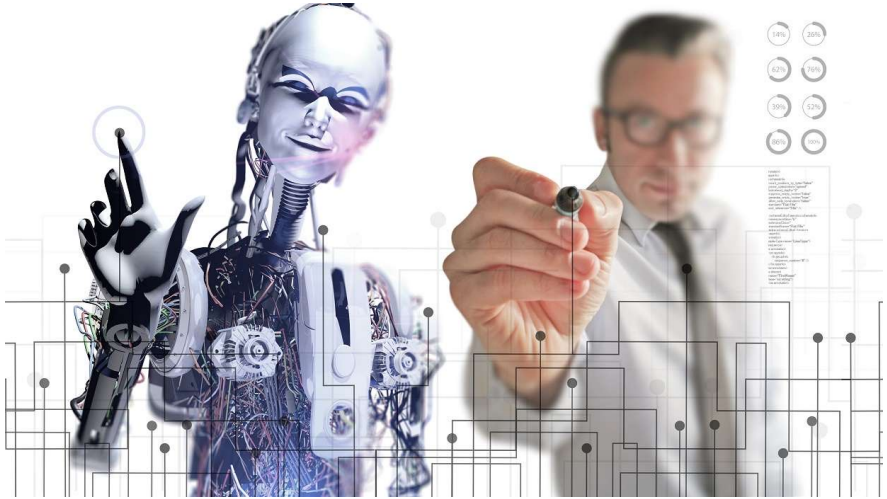
What was the most useful thing you learned/heard tonight?

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, take quick break, and them come back for live Q&A and discussion in 3 minutes!



Extended Q&A
for

AI and the Future of Work

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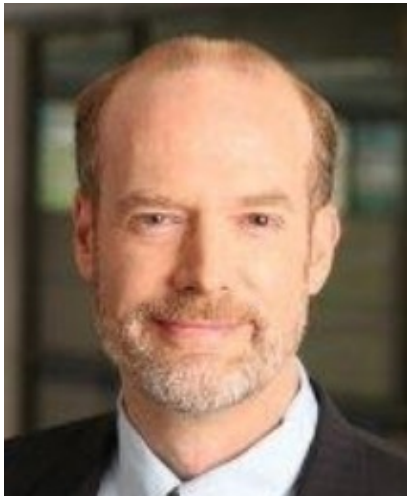
The University of Texas at Austin



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