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**LEGAL ISSUES IN ARTIFICIAL
INTELLIGENCE: CHALLENGES,
OPPORTUNITIES, & STRATEGY**

October 27, 2022

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SPEAKERS



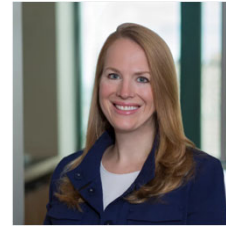
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AI IS EVERYWHERE, AFFECTING EVERY INDUSTRY

- COVID-19; medical diagnostics, improved patient care, pharmaceutical development
- Control devices/systems – e.g., autonomous vehicles
- Facial recognition software (FaceApp; unlock phones; law enforcement)
- Voice recognition
- Retail – “smart shopping”
- Financial services
- Insurance / eligibility for benefits
- Rubik’s Cube, Poker
- Matchmaking – love connections, roommates, real estate
- Recommendation Engines (Amazon, Netflix)

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New Scientist

Artificial intelligence is being asked to predict the future of AI

PR Newswire

Stability AI Announces \$101 Million in Funding for Open-Source Artificial Intelligence

PRNewswire/ -- Stability AI, the world's first community-driven, open-source artificial intelligence (AI) company today announced USD \$101...

SciTechDaily

Artificial Intelligence Can Accurately Predict Human Response to New Drug Compounds

Between identifying a potential therapeutic compound and U. S. Food and Drug Administration (FDA) approval of a new drug is an arduous...

IFLScience

A Party Led By Artificial Intelligence Is Trying To Run For Danish Government

"A party led by artificial intelligence (AI) is attempting to run for Danish government" is a sentence you'd expect to find in a sci-fi...

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AI FUN FACTS

- The global AI market is expected to reach a \$190.61 billion market value by 2025.*
- Worldwide AI software revenue is forecast to total \$62.5 billion in 2022, an increase of 21.3% from 2021.
- AI startups got record funding of \$7.4 billion in Q2 of 2019.
- By March 2019, there were 279,145 AI patent applications in the U.S.
- The forecasted AI annual growth rate between 2020 and 2027 is 33.2%.
- **Only 7% of companies don't use AI but are looking into it.**

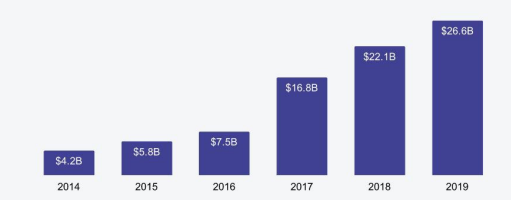
Sources: Semrush, 65 Artificial Intelligence Statistics for 2021 and Beyond (Feb. 2021); *Gartner Forecasts Worldwide Artificial Intelligence Software Market to Reach \$62 Billion in 2022 (Nov. 21).

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AI startups saw record funding in 2019

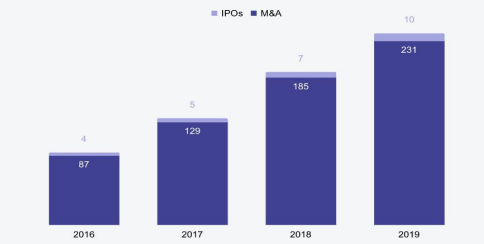
Amount of funding per year, 2014-2019



Roberto Torres for CIO Dive, data from CB Insights.

M&A activity among AI companies doubled in 3 years

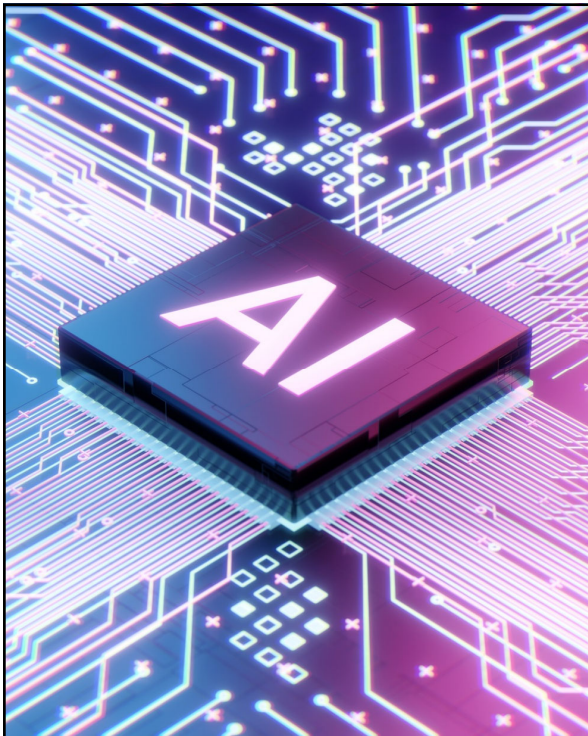
Mergers, acquisitions and IPOs of AI companies, 2016-2019



Roberto Torres for CIO Dive, data from CB Insights.

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INVENTING AI – USPTO STUDY* (2020)

- AI innovation is expanding broadly across technologies, inventor-patentees, organizations, and geography.
- From 2002 to 2018, annual AI patent applications increased by more than 100%, rising from 30,000 to more than 60,000 annually.
- % of inventor-patentees who are active in AI started at 1% in 1976 and increased to 25% by 2018. Growth in the % of organizations patenting in AI has been similar.

*<https://www.uspto.gov/sites/default/files/documents/OCE-DH-AI.pdf>

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[T]here is no ambiguity: the Patent Act requires that inventors must be natural persons; that is, human beings.

Thaler v. Vidal, 43 F.4th 1207, 1210 (Fed. Cir. 2022)



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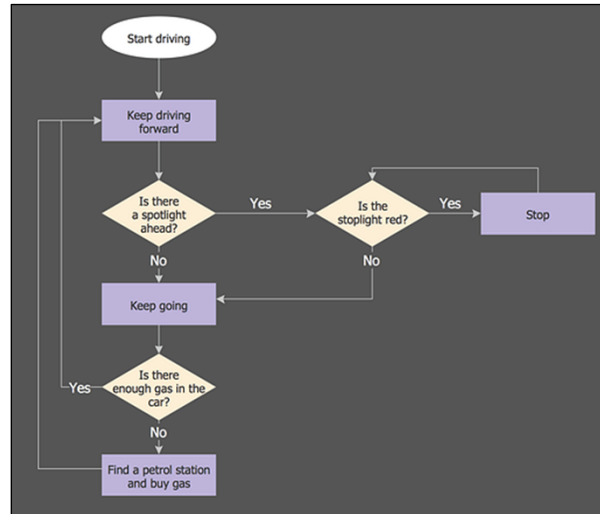
ARTIFICIAL INTELLIGENCE PRIMER

- Definition of Artificial Intelligence (AI)
 - Use cases
 - Training
 - Differences from traditional programming (e.g., rule-based systems)
- AI Model Training
- What Does A Real-world AI System Implementation Look Like?

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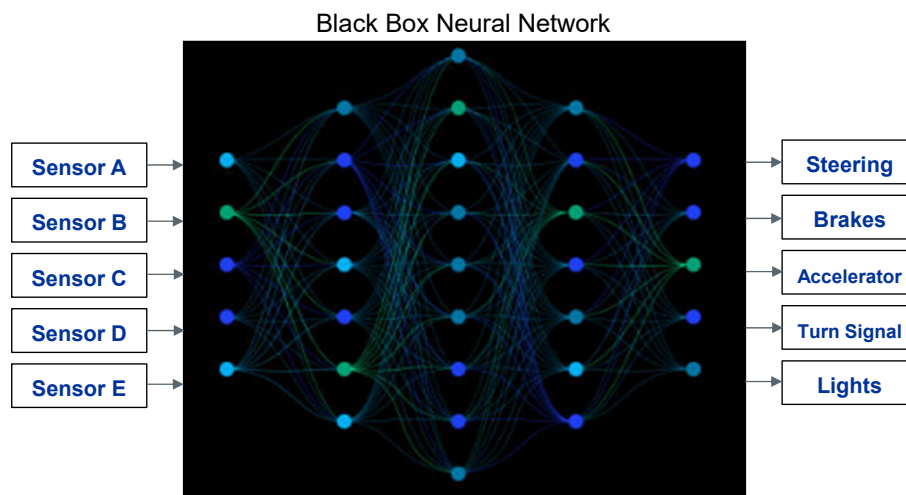
HUMAN DRIVING – RULE BASED SYSTEM



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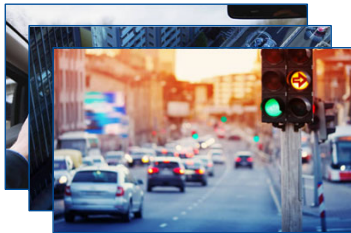
EXAMPLE AUTONOMOUS VEHICLE AI SYSTEM



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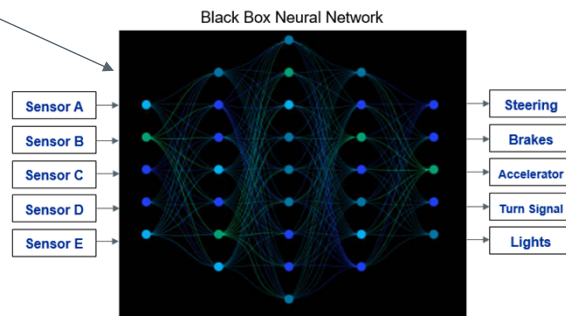


EXAMPLE AUTONOMOUS VEHICLE AI SYSTEM



Training Data

- What did sensors see?
- What did vehicle do?
- Good/Bad result?



Adjust network link weights

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NEURAL NETWORK ON DISK



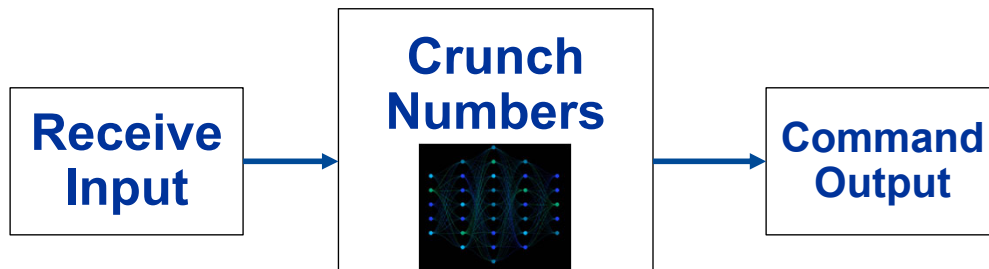
Net Level 1	Net Level 2	Net Level 3	Net Level 4
0.71670789	0.65464247	0.94140947	0.27559735
0.78627994	0.64314185	0.39769342	0.30405203
0.93077807	0.24058133	0.04036895	0.04981333
0.79273771	0.00475161	0.64245893	0.16814723
0.96653319	0.2967301	0.22474418	0.76408047
0.0364075	0.5097785	0.82848005	0.33124268
0.01605738	0.56777239	0.35326962	0.27356628
0.55042982	0.84204864	0.12300848	0.75595378
0.01327092	0.47617459	0.85941631	0.35887882
0.40772848	0.47086074	0.33423927	0.20186341
0.24544537	0.34568251	0.81394849	0.96349858
0.94985022	0.1383682	0.74555881	0.48589839
0.8749236	0.95099097	0.34832536	0.967393
0.95241285	0.8064715	0.92861003	0.48686267
0.52178923	0.22380145	0.38578738	0.11437305
0.78911562	0.43954991	0.75138292	0.78727983
0.31026792	0.89222897	0.78478942	0.74448121
0.2564949	0.8387473	0.30417886	0.74955659
0.29456709	0.85058523	0.3352597	0.7333318

Different training data would yield completely different neural network weights

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NEURAL NETWORK PROCESSING



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CURRENT BEST PRACTICES FOR IP PROTECTION OF AI

- **Patents**
 - Aspects of AI that are observable (e.g., interface of autonomous vehicle AI and vehicle braking system)
- **Trade Secrets**
 - Buried intelligence (e.g., trained neural network for controlling braking system)
- **Copyright**
 - Aspects of AI that are original expression authored by a human



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OBSERVATIONS REGARDING AI SYSTEMS

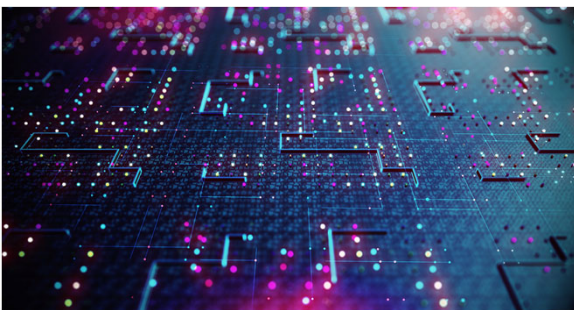
- Well trained AI can make great decisions, especially regarding routine matters on which they are well trained
- Training is key - AI models trained differently will behave differently
- Models may be black boxes to the outside world
 - This has significant IP implications
- Typically not designed to provide intermediate decision-making information



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BUT THE WHYS OFTEN MATTER!



Areas of law that might try to impose an explainability requirement:

- Labor and employment
- Tort Law
- National, State, and Local Regulations

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AI IN LABOR AND EMPLOYMENT

- AI use cases in the HR and Labor spaces
 - Hiring
 - Performance Monitoring
- Legal Issues
 - Privacy
 - Discriminatory Practice Issues
- AI Regulations and Requirements for Permissible Use



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TORT AND REGULATORY

- Tort law looks at who is at fault where explanation of behavior matters
- NHTSA requires reporting of crashes involving Automated Driving Systems (ADS) and Advanced Driver Assistance Systems (ADAS)
 - In some instances, within one calendar day



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IS EXPLAINABILITY PRACTICALLY ATTAINABLE FROM A TECHNICAL STANDPOINT?



Net Level 1	Net Level 2	Net Level 3	Net Level 4
0.71670789	0.65464247	0.94140947	0.27559735
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0.29456709	0.85058523	0.3352597	0.7333318

Suboptimal AI for the sake of explainability?

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EFFECTS OF EXPLAINABILITY REQUIREMENT ON AI IP

- Additional required public disclosures
- Impact on trade secret protectability
- NHTSA autonomous vehicle reporting requirements as an example

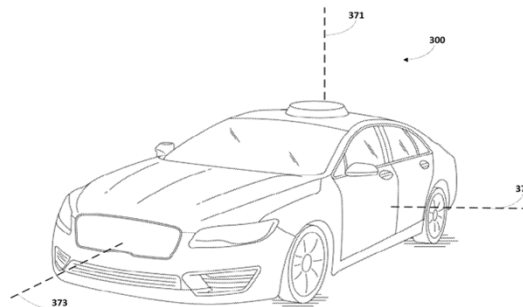


FIG. 3

U.S. Patent
Jun. 14, 2022
Sheet 3 of 12
US 11,358,601 B2

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EDUCATION IS KEY

- Conflict between legal authorities, regulatory decision makers, and the technology is inevitable
- Emerging technology in conflict with established legal paradigms
- Uninformed statutes, regulations, or case decisions could significantly hamper technology progress
- Rethink current legal state of play (e.g., strict liability in place of fault-based constructs)

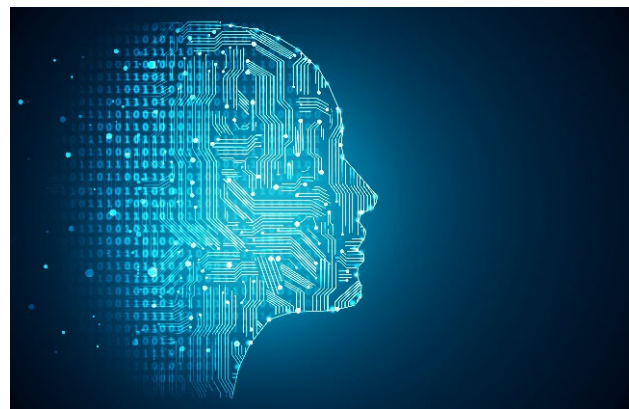


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AI IN HEALTH CARE

- Predictive analytics:
 - Disease prevention, origination and spread
 - Population vulnerabilities / demographics
 - Disease management
- Diagnostics
- Surgical techniques



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ARTIFICIAL INTELLIGENCE & THE COVID-19 PANDEMIC

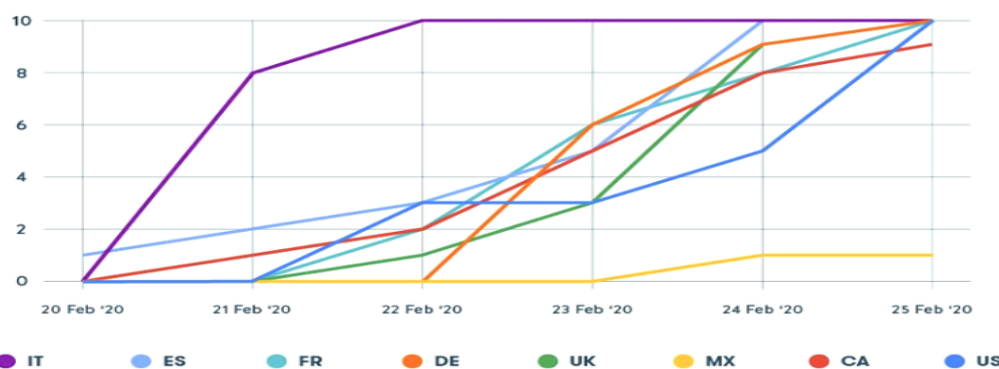
- Rapid change in shopping trends and a diversion from what AI has learned as “normal human behavior” predicts pandemic behavior.
- Sudden shift in the “mainstays” of Amazon’s top ten—phone cases, phone chargers, Legos—replaced with pandemic-related items (masks, hand sanitizer).

See Will Douglas Heaven, *Our weird behavior during the pandemic is messing with AI models*, MIT Technology Review, May 11, 2020.

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Number of Top 10 Amazon search terms* related to the Coronavirus



*Terms include face masks, hand sanitisers, disinfectant, etc.

nozzle

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ARTIFICIAL INTELLIGENCE & THE COVID-19 PANDEMIC

- These changes significantly impacted AI models and algorithms: **inventory management & fraud detection.**
- According to Pactera Edge, a global AI consultancy, **“automation is in tailspin.”** Others say they are keeping a cautious eye on automated systems that are just about holding up, stepping in with a **manual correction** when needed.
- Pandemic revealed our lives are intertwined with AI, exposing a delicate codependence in which changes to our behavior change how AI works, and changes to how AI works change our behavior. This is also a reminder that **human involvement in automated systems remains key.**

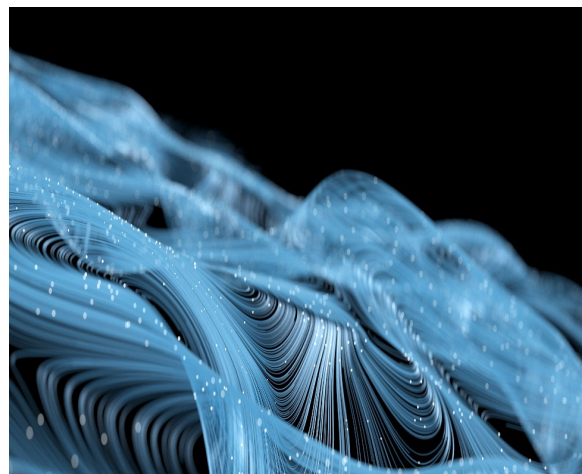
See also: Gregory Barber, *Why Didn't Artificial Intelligence Save Us From Covid-19?* WIRED, May 19, 2020

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DIGITAL HEALTH & BIG DATA: COVID-19

- Digital Health – rapidly adopted and embraced
 - CMS, OCR, OIG, DEA, FDA, state laws and regulations
- Big Data - numerous uses (testing, data & contact tracing)
 - National Response Portal (collaborative effort of tech & healthcare)
 - Goal to arm health and gov't officials with data-driven insights



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AI in the healthcare industry



of healthcare executives trust AI to support nonclinical, administrative processes to allow clinicians more time for patient care

Source: [Optum](#)

Top 3 potential improvements in patient outcomes due to AI



Virtual patient care (41%)



Diagnosis and predicting outcomes (40%)



Medical image interpretation (36%)

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AI IN HEALTHCARE: A MEDICAL IMAGING EXAMPLE



- Medtronic has developed an intelligent endoscopy module
- Computer-aided detection system for colon cancer
- Scans every visual frame of the colonoscopy in real time
- Identifies small, flat polyps that go undetected by human eye
- It detects the undetectable

<https://www.medtronic.com/us-en/our-company/artificial-intelligence-smart-devices-power-personalized-medicine.html>

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INCREASED ATTENTION BY THE GOVERNMENT

- **NATIONAL ARTIFICIAL INTELLIGENCE INITIATIVE** (www.ai.gov)
- [Algorithmic Accountability Act of 2022](#)
- [\(FTC\) Trade Regulation Rule on Commercial Surveillance and Data Security](#), (comments due 10/21/2022)
- [\(DOC/ITA\) Request for Comments on Artificial Intelligence Export Competitiveness](#), (comments due 10/17/2022)
- [\(DOT\) Enhancing the Safety of Vulnerable Road Users at Intersections; Request for Information](#), (comments due 10/16/2022)
- [\(OSTP\) Blueprint for an AI Bill of Rights](#), (10/04/2022)

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AI BILL OF RIGHTS

- Protection from systems deemed “unsafe or ineffective”
- Protection from discrimination from algorithms
- Protection from “from abusive data practices” by safeguards built in to AI systems and have control over how data about them is used;
- Awareness/notice of when an automated system is in use and be aware of how it could affect them;
- Right to opt out of such systems “where appropriate” and get help from a person instead of a computer.

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ACTION ITEMS / TAKE-AWAYS

- Be strategic in development, use, and acquisition of AI innovations.
- Evaluate IP protection protocols, particularly with regard to patent/trade secret decision making.
- Develop disclosure response plan before an incident occurs.
- Consider efforts to educate lawmakers regarding impacts of AI laws and regulations that are not well thought out.
- Seek advice from regulatory counsel regarding practical effects of AI disclosure requirements.
- Monitor legal / regulatory developments at federal, state, and local levels.

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QUESTIONS?



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