

Artificial Intelligence in Mobile Medicine (EMS & Fire): Implications, Potential and Pitfalls

Jonathon S. Feit, MBA MA
Co-Founder & Chief Executive
Jonathon.Feit@beyondlucid.com
(650) 648-3727

BEYOND
LUCID

*We Connect Mobile Medical
Professionals with Their
Ecosystems of Care*

What IS Artificial Intelligence?

Before we can contemplate the
power of A.I. as a set of capabilities,
we must define what we are referring to.
Perhaps also what we are not talking about.

Goal Today: Set Brain on Fire 🔥

This discussion will be about ideas, not a technical dive (we can have that discussion, too, if you want).

Let's contemplate what we want

A.I. in Mobile Medicine to be and do.

Goal Today: Set Brain on Fire 🔥

Futurism • VISIONCAST

Let's contemplate what we want

A.I. in Mobile Medicine to be and do.

Why? Because My Mother Said:

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When it comes to A.I. in healthcare:

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When it comes to A.I. in healthcare:

“All these things just sound like Epic to me.”

Why? Because My Mother Said:

When it comes to A.I. in healthcare:

“All these things just sound like Epic to me.”



Two Fundamental “Types” of AI



Generative

Other than
Generative

Generative A.I.

Creates
Stuff

Calculates
Stuff

Private
Sources

Public
Sources

Access to Data

- But which data is central to truth vs. error and bias.

Generative A.I.

Medical
charting

Exchange
queries

Radiology
readings

Teaching
materials

Letters and
opinions

Research
compendia

Molecular
interactions

High-speed
simulations

(e.g., “Monte Carlos”)

No Wonder Folks are Gaga For It

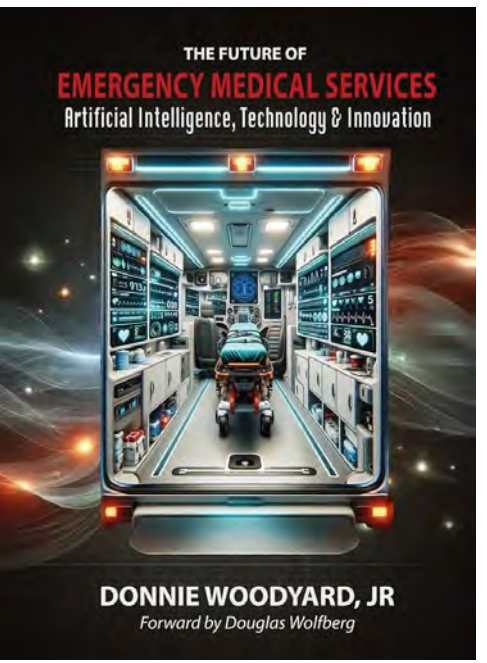


The New York Times

July 11, 2023

A.I. Could Solve Some of Humanity's Hardest Problems. It Already Has.

Demis Hassabis, the chief executive of DeepMind, discusses how A.I. systems can accelerate scientific research.



TechCrunch

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BIOTECH & HEALTH

How Abridge became one of the most talked about healthcare AI startups

HEALTHCARE AI FOR DUMMIES

20. AI-Powered Healthcare: Optimizing Clinical Workflows & Patient Care

DR. TINA SHAH
Chief Clinical Officer
Abridge

JOHN BEADLE
Co-Founder & Managing Partner
Aeglis Ventures

MISSY KRASNER
Gen AI Investor/Board Advisor
Series Moderator

SLICE of healthcare
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Charting AI's future in health and medicine

Welcome and opening remarks

Fei-Fei Li, PhD

Lloyd Minor, MD

RAISE Health Symposium 2024

Institute for Pandemics - University of Toronto

AI and Infectious Diseases Speaker Series

AI & Crowdsourcing for Resilient Hospitals & Enhanced Patient Care

Much of A.I. Isn't New. Speed Is.



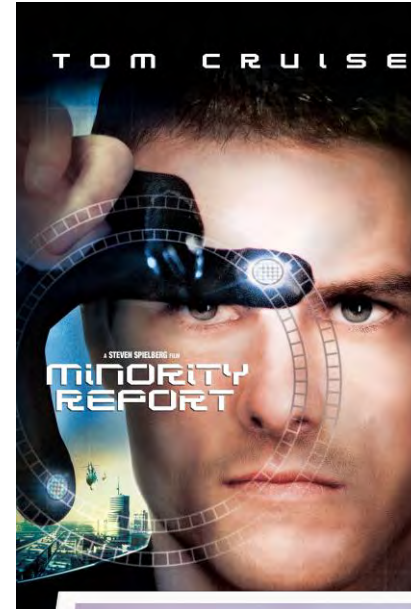
Birth of AI: 1950-1956

This range of time was when the interest in AI really came to a head. Alan Turing published his work “Computer Machinery and Intelligence” which eventually became The Turing Test, which experts used to measure computer intelligence. The term “artificial intelligence” was coined and came into popular use.

Dates of note:

- **1950:** Alan Turing published “[Computer Machinery and Intelligence](#)” which proposed a test of machine intelligence called The Imitation Game.
- **1952:** A computer scientist named [Arthur Samuel](#) developed a program to play checkers, which is the first to ever learn the game independently.
- **1955:** [John McCarthy](#) held a workshop at Dartmouth on “artificial intelligence” which is the first use of the word, and how it came into popular usage.

SOURCE: <https://www.tableau.com/data-insights/ai/history>



Mission Critical Generative A.I.

ChatGPT + Sources → Infectious Disease of High Consequence (IDHC) Procedure



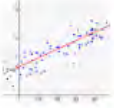













































- [AZ Dept of Health Services: Emergency Response Plan. December 2016](#)
- [AZ Dept of Health Services: Infectious Disease of High Consequence Plan. 3/2023](#)
- [ASPR-TRACIE \(HHS\): EMS Infectious Disease Playbook, Version 2.0. June 2023](#)
- [EMS.gov: EMS Pandemic Influenza Guidelines for Statewide Adoption, USDOT. 5/3/2007](#)
- Phoenix Sky Harbor Communicable Disease Response Plan (CDRP). 2021
- PFD Mgmt. Procedures Vol. I (Personnel), Vol. 11 (Operations.), and Vol. 12 (EMS Proc.).
- Doctrine from PFD Infection Control Officer, PFD Occupational Health center, PFD Homeland Defense Bureau, PFD Resource Management (Logistics Section).
- Maricopa County DPH Infectious Disease Annex, v1.7 FY 2019-20 Update. National Emerging Special Pathogens Training & Education Center (NETEC): [EMS Guidelines for Marburg Virus Disease. 3/9/2023](#)
- Phoenix Fire Dept. Medical Director, Maricopa County Dept. of Public Health Epidemiologist



PFD Capt. David Moffit

Other Than Generative A.I.

Other Than Generative A.I.

 Decision trees 	 Linear regression 	 Logistic regression 
 Random Forest 	 Reinforcement learning 	 Support Vector Machines 
 Unsupervised learning 	 Deep learning 	 Naive Bayes 
 Neural network 	 KNN algorithm 	 Generative Adversarial N... 
 Convolutional neural net... 	 Large language models 	 Limited memory 
 Linear Discriminant Analy... 	 Reactive machines 	 Theory of mind 
 Dimensionality reduction 	 Supervised learning 	 General AI 
 Narrow AI 	 AI modeling 	 Clustering 

Types of AI models

From sources across the web

Source:
Google...no
irony there!



Other Than Generative A.I.

Collects
Stuff

Connects
Stuff

Access to Data

- But which data is central to truth vs. error and bias.

Private
Sources

Public
Sources

Other Than Generative A.I.

Biometric
Identification

Federated
Health Data

Dynamic
Protocols

Patient
Matching

Risk
Identification

R-T Triage
Activation

SDOH
Intervention

MVC-Injury
Prediction

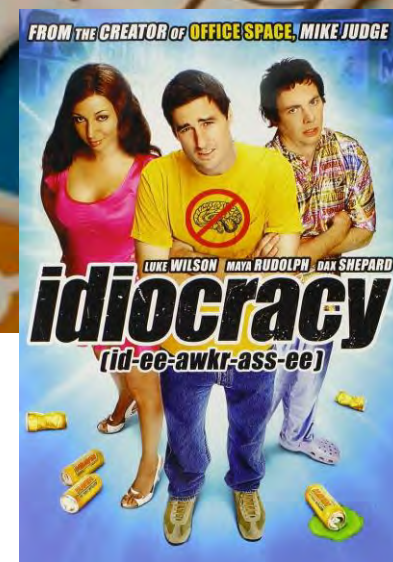
MVC = motor
vehicle crash

But Are We Pushing Far Enough?

But Are We Pushing Far Enough?



But Are We Pushing Far Enough?



But Are We Pushing Far Enough?



Force
Multiplier

Generative AI



Thinking
For You

Other than
Generative AI

But Are We Pushing Far Enough?

Processing the
World's Data

Generative AI

Coming Up with
New Insights

Other than
Generative AI

Some are questioning AI's limits

TECHNOLOGY

Would you take a drug discovered by artificial intelligence?

An OCD drug created via AI will be tested on humans.

Vox

Some are questioning AI's limits

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Vox

Using AI to create a vaccine revolution

Clinical stage company Evaxion Biotech is using artificial intelligence (AI) to simulate the immune system and create predictive models to identify novel targets for vaccines against bacterial and viral diseases and immunotherapies for cancer.



biopharmadealmakers

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 **biopharmadealmakers**

ARTIFICIAL INTELLIGENCE

MIT
Technology
Review

AI is dreaming up drugs that no one has ever seen. Now we've got to see if they work.

AI automation throughout the drug development pipeline is opening up the possibility of faster, cheaper pharmaceuticals.

Are There Limits? Tech vs. Ethics

“Band-Aids Over Bullet Holes” – Is removing the human good...or even feasible?

Is the techno-chase
sidetracking us from
investing in what still
needs human touch?



Are There Limits? Tech vs. Ethics

“Band-Aids Over Bullet Holes” – Is removing the human good...or even feasible?



<https://spinalcord.org/disability-products-services/obi-robotic-feeding-device/>



<https://newatlas.com/robotics/cobi-robot-needle-less-vaccinations/>

Are There Limits? Tech vs. Ethics

“Band-Aids Over Bullet Holes” – Is removing the human good...or even feasible?



<https://homelessdeathscount.org/>



<https://www.stlpr.org/health-science-environment/2016-02-18/st-louis-county-police-add-heroin-overdose-antidote-to-patrol-cars>

Are There Limits? Tech vs. Ethics

“Band-Aids Over Bullet Holes” – Is removing the human good...or even feasible?



https://invisiblepeople.tv/wp-content/uploads/2012/08/helping_the_homeless-1-1024x680.jpg



Teaching Children How to Reverse an Overdose

In rural Carter County, Tenn., health officials have embraced a strategy for stemming addiction: Teaching children as young as 6 how to administer Narcan, a nasal spray that can stop an opioid overdose from being fatal.

<https://www.nytimes.com/2020/02/23/us/opioids-tennessee-narcan-training.html>

The One Thing We Know for Sure

The One Thing We Know for Sure



The One Thing We Know for Sure



AI is On the Mind of Government



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Groundbreaking Framework for the Safe and Secure Deployment of AI in Critical Infrastructure Unveiled by Department of Homeland Security

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Groundbreaking Framework for the Safe and Secure Deployment of AI in Critical Infrastructure Unveiled by Department of Homeland Security

Release Date: November 14, 2024

AI is On the Mind of Government

America's Cyber Defense Agency

NATIONAL COORDINATOR FOR CRITICAL INFRASTRUCTURE SECURITY AND RESILIENCE

Key Highlights of the Framework:

- **Collaborative Guidance:** The Framework includes specific actions for key stakeholders—cloud and compute providers, AI developers, critical infrastructure owners, civil society, and public sector entities—to mitigate risks, safeguard consumer rights, and promote safe and transparent AI practices.
- **Comprehensive Coverage:** It addresses vulnerabilities unique to AI in critical infrastructure, such as attacks using AI, attacks targeting AI systems, and design failures, while also supporting a "Secure by Design" approach for AI developers.
- **Endorsement from Leadership:** DHS Secretary Alejandro N. Mayorkas emphasizes the transformative potential of AI in strengthening U.S. critical infrastructure resilience, urging leaders across sectors to embrace and implement the Framework.



AI is On the Mind of Government

Request for Information: Opportunities and Challenges of Artificial Intelligence in Transportation

Posted by the Department of Transportation on May 3, 2024

SUMMARY:

The U.S. Department of Transportation's Advanced Research Projects Agency—Infrastructure (ARPA-I) is seeking input from interested parties on the potential applications of artificial intelligence (AI) in transportation, as well as emerging challenges and opportunities in creating and deploying AI technologies in applications across all modes of transportation. The purpose of this Request for Information (RFI) is to obtain input from a broad array of stakeholders on AI opportunities, challenges and related issues in transportation pursuant to Executive Order (E.O.) 14110 of October 30, 2023 entitled “Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence”.

BEYOND LUCID TECHNOLOGIES'S COMMENT #: DOT-OST-2024-0049-0037

Posted by the Department of Transportation on Jul 1, 2024

AI is On the Mind of Government



U.S. Department of Transportation

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Artificial Intelligence

U.S. DOT Artificial Intelligence Activities

U.S. DOT is committed to safety and innovation and sees artificial intelligence (AI) as a promising capability to help achieve these aims:

- **Enabling the safe integration of AI into the transportation system**, including as a foundational technology in many [automated driving systems](#) and [unmanned aircraft systems](#). U.S. DOT's work in this area also focuses on safe integration of AI into conventional aircraft systems as well as traffic management operations across modes.
- **Adopting and deploying AI-based tools into internal operations, research, and citizen-facing services**. U.S. DOT has focused investments in the application of AI into improving the efficiency and effectiveness of internal processes and research, including natural language processing, computer vision, and machine learning-based predictive analytics.



But Why So Much Interest Now?

...And what can the problems that the federal government is seeking to solve tell us about **the power, potential, and pitfalls of A.I.?**

But Why So Much Interest Now?

The “Silver
Tsunami”

Autism
Rights Mvmt

Rapid Global
Mobility

Climate
Disasters

Availability
of Data/HIE

Whole Blood
in the Field

Man-Made
Crises/Terror

Morbidity on
Roadways

How Far Will People Let A.I. Go?

Trust
Confidence

Love
Parenting

Equity
Community

Tradition
Faith/Religion

Fear
Mystery

Guilt
Regret/FOMO

Aspiration
Legacy

Creativity
Imagination

Implications for Emergencies

Dynamic Routing
→ Code Black
or Status Zero

Dynamic Routing
→ Status Bypass
(Patient Distrib.)

Clinical Decision
Support/Protocol
Guidance

Family
Reunification
After Evacuation

Collective After-
Action Review

Reduce Burdens
→ Improve Hiring

Sentinel Event
Tracking • MH/BH

Syn. Surveillance
+ Contagion
Spread Modeling

Threat ID and
Localization /
Public Safety

Automation of
Mutual Aid at
Vulnerable Sites

Prevent Adverse
Encounters,
2ndary Emergency

Protect People w/
Special Needs +
Critical Wishes

Thank you! Please get in touch if you are working on related grants + projects, and/or want to collaboratively bring them to fruition.



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