MEDINFO23

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AI for healthcare: Friend or Foe?

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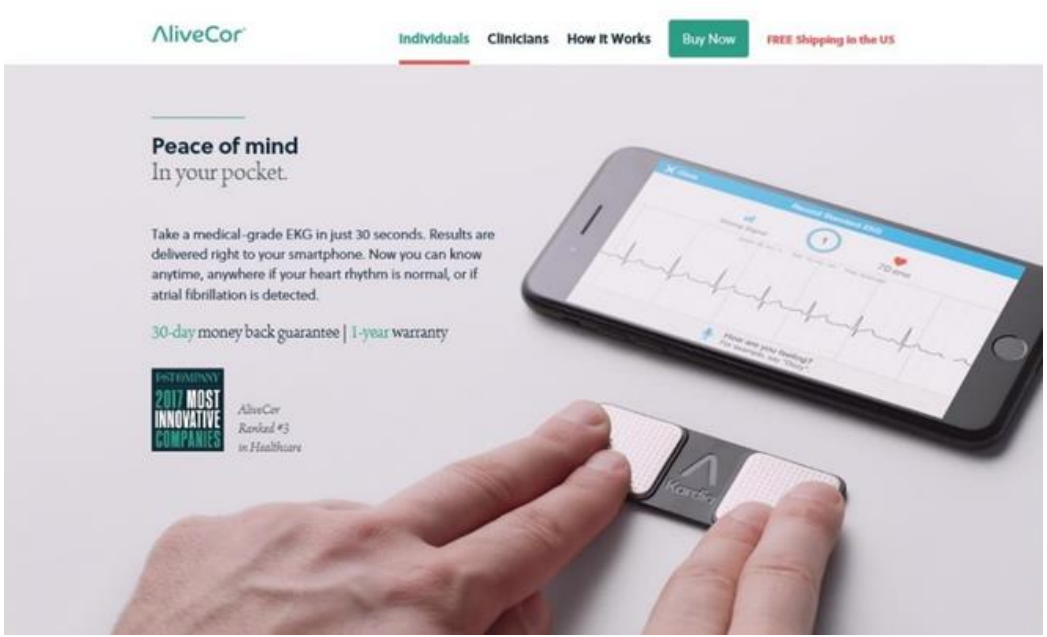
AIDH IMIA

Introduction

- Let's acknowledge up front that we are talking about a **VERY LARGE** range of products and tools when we talk about Artificial Intelligence (AI) in healthcare

- **BUT that's OK**
- The question at hand is …. "is AI for healthcare a friend or a foe ?"

Friendly enough …

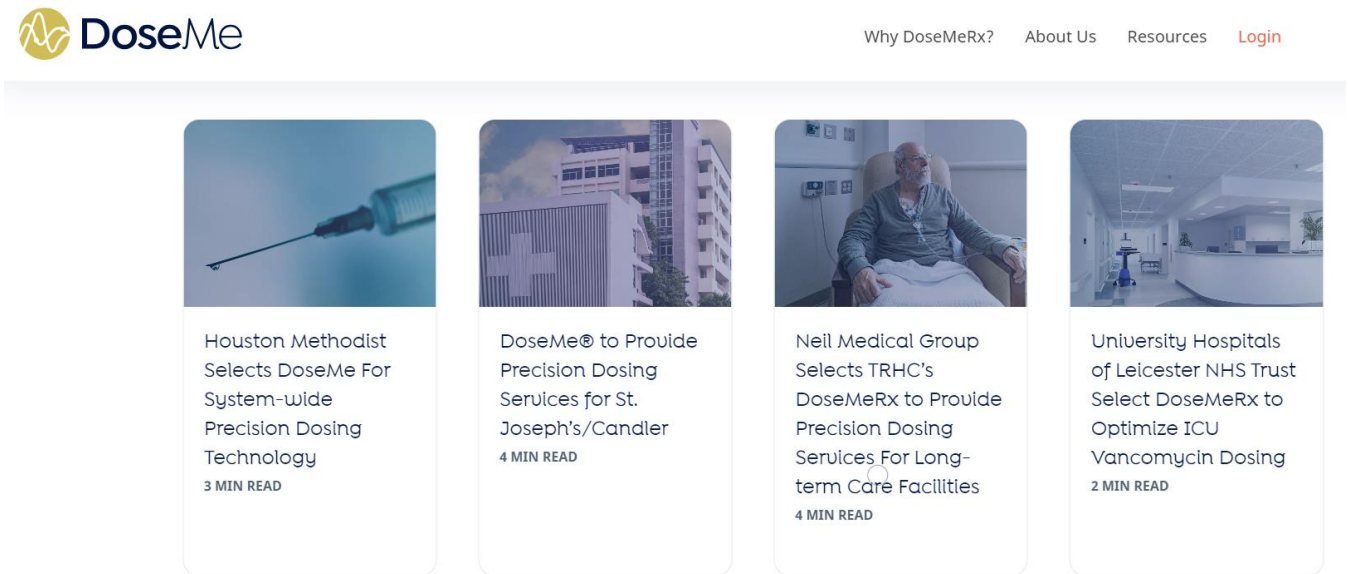


Ref - Alivecor | Alivecor Home Accessed 30/6/18

Friendly enough …

Ref - Life Whisperer Embryo Quality (LWEQ) | Life Whisperer Accessed 30/6/23

Friendly enough …



Ref - DoseMeRx • The #1 Trusted Bayesian Dosing Platform (doseme-rx.com) Accessed 30/6/23

Not so much !!!!

CT-GAN: Malicious Tampering of 3D Medical Imagery using Deep Learning

Yisroel Mirsky, Tom Mahler, Ilan Shelef, Yuval Elovici

(Submitted on 11 Jan 2019 (v1), last revised 6 Jun 2019 (this version, v3))

In 2018, clinics and hospitals were hit with numerous attacks leading to significant data breaches and interruptions in medical services. An attacker with access to medical records can do much more than hold the data for ransom or sell it on the black market.

In this paper, we show how an attacker can use deep-learning to add or remove evidence of medical conditions from volumetric (3D) medical scans. An attacker may perform this act in order to stop a political candidate, sabotage research, commit insurance fraud, perform an act of terrorism, or even commit murder. We implement the attack using a 3D conditional GAN and show how the framework (CT-GAN) can be automated. Although the body is complex and 3D medical scans are very large, CT-GAN achieves realistic results which can be executed in milliseconds.

To evaluate the attack, we focused on injecting and removing lung cancer from CT scans. We show how three expert radiologists and a state-of-the-art deep learning AI are highly susceptible to the attack. We also explore the attack surface of a modern radiology network and demonstrate one attack vector: we intercepted and manipulated CT scans in an active hospital network with a covert penetration test.

Ref - [1901.03597] CT-GAN: Malicious Tampering of 3D Medical Imagery using Deep Learning (arxiv.org)
Accessed 30/6/23

Not so much !!!!

JOURNAL ARTICLE

"Mm-hm," "Uh-uh": are non-lexical conversational sounds deal breakers for the ambient clinical documentation technology?

Get access ›

Brian D Tran, Kareem Latif, Tera L Reynolds, Jihyun Park, Jennifer Elston Lafata, Ming Tai-Seale, Kai Zheng ✉

Journal of the American Medical Informatics Association, Volume 30, Issue 4, April 2023, Pages 703–711, https://doi.org/10.1093/jamia/ocad001
Published: 23 January 2023 **Article history** ▾

Discussion and Conclusion

Current ASR solutions are not capable of properly recognizing NLCS, particularly those that convey clinically relevant information. Although the volume of NLCS in our evaluation data was very small (2.4% of the total corpus; and for NLCS that conveyed clinically relevant information: 0.06%), incorrect recognition of them could result in inaccuracies in clinical documentation and introduce new patient safety risks.

Ref - "Mm-hm," "Uh-uh": are non-lexical conversational sounds deal breakers for the ambient clinical documentation technology? | Journal of the American Medical Informatics Association | Oxford Academic (oup.com) Accessed 30/6/23

So how do we reconcile all this ….

- Again .. the question at hand is …. “is AI for healthcare a friend or a foe ?”
- … and as always such questions attempt to make black or white of **something that’s actually very grey.**

- So the challenge before us is how to reconcile all this !!!!
- With that in mind … I have a suggestion …..

An alternative view …. AI as a "frenemy"

- **What is a "frenemy" …?**

Dictionary

Definitions from Oxford Languages · Learn more

frenemy

noun **INFORMAL**

noun: **frenemy**; plural noun: **frenemies**

a person with whom one is friendly despite a fundamental dislike or rivalry.

Ref - frenemy meaning - Google Search Accessed 30/6/23

So what now ???

- It's been suggested that AI will not replace doctors / nurses / HCPs … but that doctors / nurses / HCPs who use AI will replace those who do not - I think that this premise is close to the mark

- **So the challenge before all of us** … not only in healthcare … but in society in general … **is to manage the relationships with our new frenemies …. and to work towards a more traditional friendship into the future**

- **We can do that by remembering that <u>WE are the adults (read .. humans) in the room</u>**

Q & A