

THE COMING PROMISE OF AI IN HEALTHCARE SIM

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EXDIR, SCSIL, EVMS

NATIONAL DISTANCE LEARNING WEEK

6 NOVEMBER 2023

TODAY'S GOAL

- This session will be a presentation on the ways that artificial intelligence (AI) will eventually be used within healthcare simulation centers.
- The goal is to impart a less technical, more layman's understanding of the different ways that AI will eventually bolster standardized patient, simulation technology, and life support training programs.

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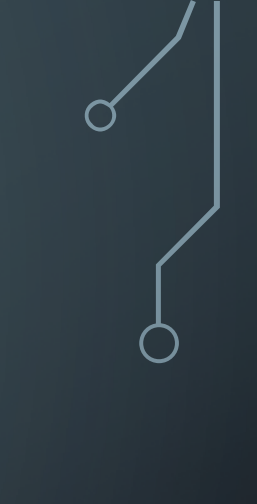

- Executive Director, Sentara Center for Simulation and Immersive Learning @ Eastern Virginia Medical School, Norfolk, Virginia
- President of the Society for Simulation in Healthcare (2020)
- Retired Marine Corps Lieutenant Colonel
- Engineer & Computer Scientist
- Simulation Zealot

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AGENDA

- Some Definitions
 - Contextualizing AI
 - Simulation Program Challenges, with Related AI Solutions
 - Preparing for AI
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HUMAN INTELLIGENCE

- Mental quality that consists of the abilities to learn from experience, adapt to new situations, understand and handle abstract concepts, and use knowledge to manipulate one's environment.
- The ability to comprehend or understand.
 - It is basically a combination of reasoning, memory, imagination, and judgment; each of these faculties relies upon the others.
 - Intelligence is not an entity within a person but a combination of cognitive skills and knowledge made evident by behaviors that are adaptive.

ARTIFICIAL INTELLIGENCE (AI)

- The capacity of computers or other machines to exhibit or simulate intelligent behaviour; the field of study concerned with this.
- A branch of computer science in which attempts are made to replicate human intellectual functions. One application is the development of computer programs for diagnosis. Such programs are often based on epidemiologic analysis of data in large numbers of medical records;

MAIN BRANCHES OF AI

- Machine learning
- Neural networks
- Deep learning
- Computer vision
- Natural language processing
- Cognitive computing

Generative AI

GPT-4
ChatGPT
AlphaCode
GitHub Copilot
Bard
Cohere Generate
Claude
Synthesia
DALL-E 2

WHAT MAKES AI SPECIAL

- AI uses algorithms and statistical models to analyze data, recognize patterns, and make predictions, suggestions, or decisions.
- AI can learn/adapt from examples, rather than being explicitly programmed to execute specific instructions.
- AI is typically designed or allowed to never stop learning/adapting.

WHY “THE COMING PROMISE?”

- AI as a core technology is young, still.
- AI isn't ready for “healthcare education primetime.”
- Tech is cool, trustworthy applications are cooler.
- Healthcare simulationists have needs that have not been well articulated.

AI IS A TOOL... AND GOOD TOOLS:

- Make difficult things easier
- Solve problems
- Fit the user and task
- Are easy to use
- Are well designed
- Are trustworthy
- Make the user happy

- Allow the user to do things...

- Quicker
- More efficiently
- More effectively
- Safer
- Reliably

aka, "Better"

YOU PROBABLY USE AI TODAY



- WAZE Navigation & Live Traffic
 - Uses, real time traffic data from users and traffic management systems
 - Provides routing
 - Predicts congestion
 - Reroutes based upon conditions
- All we have to do is give it a destination...

YOU PROBABLY USE AI TODAY



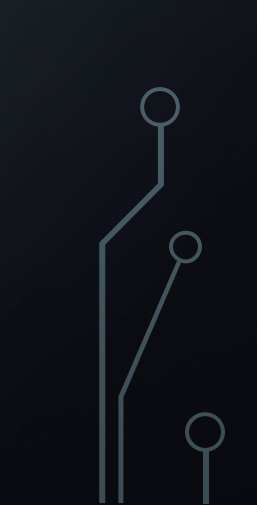

- WAZE Navigation & Live Traffic
 - Uses, real time traffic data from users and traffic management systems
 - Provides routing
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- All we have to do is give it a destination...

...and still, every once in a while, Waze still jams us up.



STANDARDIZED PATIENT PROGRAMS

AN SP IS AN INDIVIDUAL TRAINED TO PORTRAY A PATIENT WITH A SPECIFIC CONDITION IN A REALISTIC, STANDARDIZED, AND REPEATABLE WAY AND WHERE PORTRAYAL/PRESENTATION VARIES BASED ONLY ON LEARNER PERFORMANCE.



STANDARDIZED PATIENT PROGRAM CHALLENGES

PREPARATION

- Scheduling
- Case Development
- Case Training
- Learning/Refreshing SP Skills

EXECUTION

- SP Quality Control
- Video/Assessment Review
- Case Consistency Across an Event
- Consistent Learner Feedback

AI SOLUTIONS FOR SP PROGRAMS:

PREP

Scheduling
Case Development
Case Training
Learning/Refreshing SP Skills

- Smart SP Scheduling accounting for myriad individual factors
- Historical case and event analysis via data mining
- Semi-autonomous SP case prep and training via adaptive learning
- Adaptive Learning for skill refresher training

AI SOLUTIONS FOR SP PROGRAMS: EXECUTION

SP Quality Control
Video/Assessment Review
Case Consistency Across an Event
Consistent Learner Feedback

- Measurement of SP performance factors via video and data analysis
- “Consistently biased” and comprehensive video review
- Comparison of SP and student performance across an event
- Measurement of SP-Learner feedback quality via conversation, intonation, and behavior capture and analysis

The background is a dark blue gradient. In the corners, there are white line-art graphics resembling circuit traces or neural network connections. These lines are thin and connect to small white circles, creating a technical or digital aesthetic.

SIMULATION/SIMULATOR PROGRAMS

SIMULATION IS A TECHNIQUE THAT CREATES A SITUATION OR ENVIRONMENT TO ALLOW PERSONS TO EXPERIENCE A REPRESENTATION OF A REAL EVENT FOR THE PURPOSE OF PRACTICE, LEARNING, EVALUATION, TESTING, OR TO GAIN UNDERSTANDING OF SYSTEMS OR HUMAN ACTIONS.

SIMULATION/SIMULATOR PROGRAM CHALLENGES

PREPARATION

- Case Development
- Case Variation
- Learner Preparation
- Learning Differences

EXECUTION

- Instructor-Learner Ratio
- Accounting for Learner Skill Gaps
- 24/7 Access
- Adaptive Learning

AI SOLUTIONS FOR SIM PROGRAMS:

PREP

Case Development
Case Variation
Learner Preparation
Learning Differences

- Historical case analysis via data mining
- AI generated case variations that stay within trustworthy bounds
- Semi-autonomous adaptive learning to prep learners for events
- Adaptive learning adjusting modalities and topics based upon individual needs

AI SOLUTIONS FOR SIM PROGRAMS: EXECUTION

Instructor-Learner Ratio
Accounting for Learner Skill Gaps
24/7 Access
Adaptive Learning

- AI/Computer Vision to observe performance to augment instructor presence
- Autonomous measurement of performance to suggest knowledge/skill gap remediations
- AI analysis of task performance in lieu of instructor presence
- Autonomous adjustment of learning pace and topic based upon learner skill and progress

PREPARING FOR AI

- Identify and understand your operational challenges.
- Articulate your requirements - your needs - and share them.
- Partner with developers & vendors.
- Participate in creating the future you want and need.

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