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Faculty of Medicine
Siriraj Hospital

AMEE BASEL 2024

Transformative power of AI:

: Advancing Health Professions Education in the Digital Age

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WHAT'S NEW IN AMEE BASEL 2024

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Pattern in Learning/Decision Making Process

Observe	Interpret	Act
Data	Algorithms	Systems

Traditional data collection: Purposeful, Occasionally/Periodically

Big data collection: Opportunistic, Continuously

❖ AI's Role in Precision Education & Personalized Education ...

Observe

Data

Big Data Utilization:

Data Sources:

- Curricular Content, ePortfolio, Evaluations, Learning Modules, LMS, SIS, Exams, Admissions, Simulation

Centralized Data Warehouse:

- Education Data Warehouse integrates educational data from multiple sources.
- Connected to Clinical Data Warehouse for comprehensive analysis

Outputs:

- Reporting and Analytics
- Data marts for education research

Model of NYU Education Data warehouse

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Interpret
Algorithms

AI's Role in Precision Education & Personalized Education

AI-Driven Personalization: AI tailors learning experiences to individual students' needs using longitudinal data.

Adaptive learning technologies are essential tools in creating dynamic educational environments that respond to students' progress and needs.

AI in Assessment: The integration of AI in assessment processes:

- ✓ Real-time feedback and personalized learning paths.
- ✓ Evaluating clinical skills and supporting complex training assessments

Image generated by Dall-E

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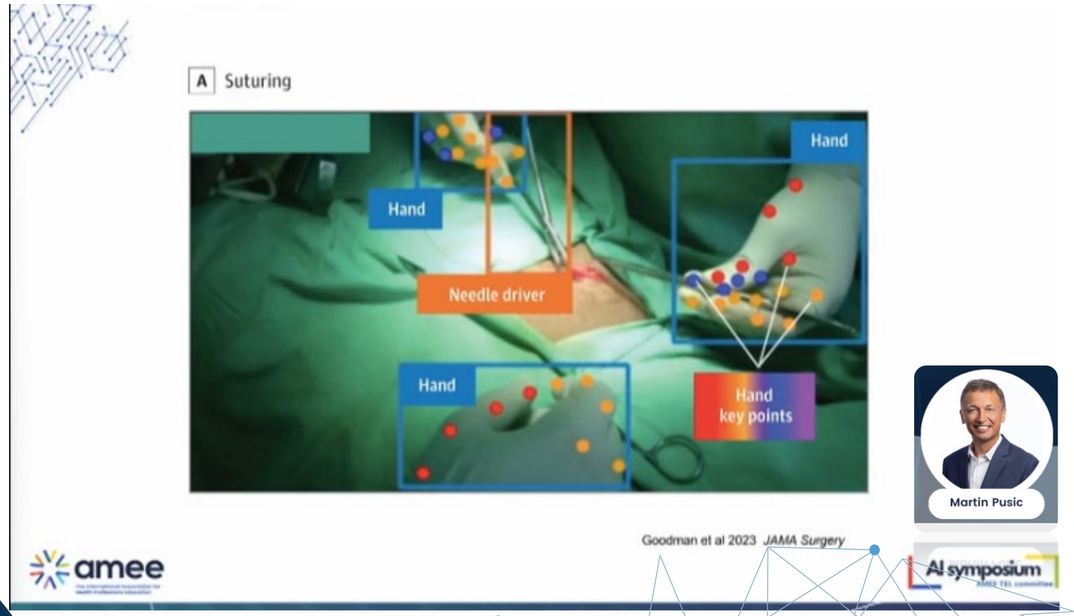
AI's Role in Precision Education & Personalized Education

Interpret
Algorithms

AI in Assessment: : Evaluating clinical skills and supporting complex training assessments

Detecting instrument holding errors



AI symposium

Original Investigation

December 6, 2023

Analyzing Surgical Technique in Diverse Open Surgical Videos With Multitask Machine Learning

Emmett D. Goodman, PhD[1,2]; Krishna K. Patel, MS[1,2]; Yilun Zhang, BS[5]; et al

» Author Affiliations

JAMA Surg. 2024;159(2):185-192. doi:10.1001/jamasurg.2023.6262

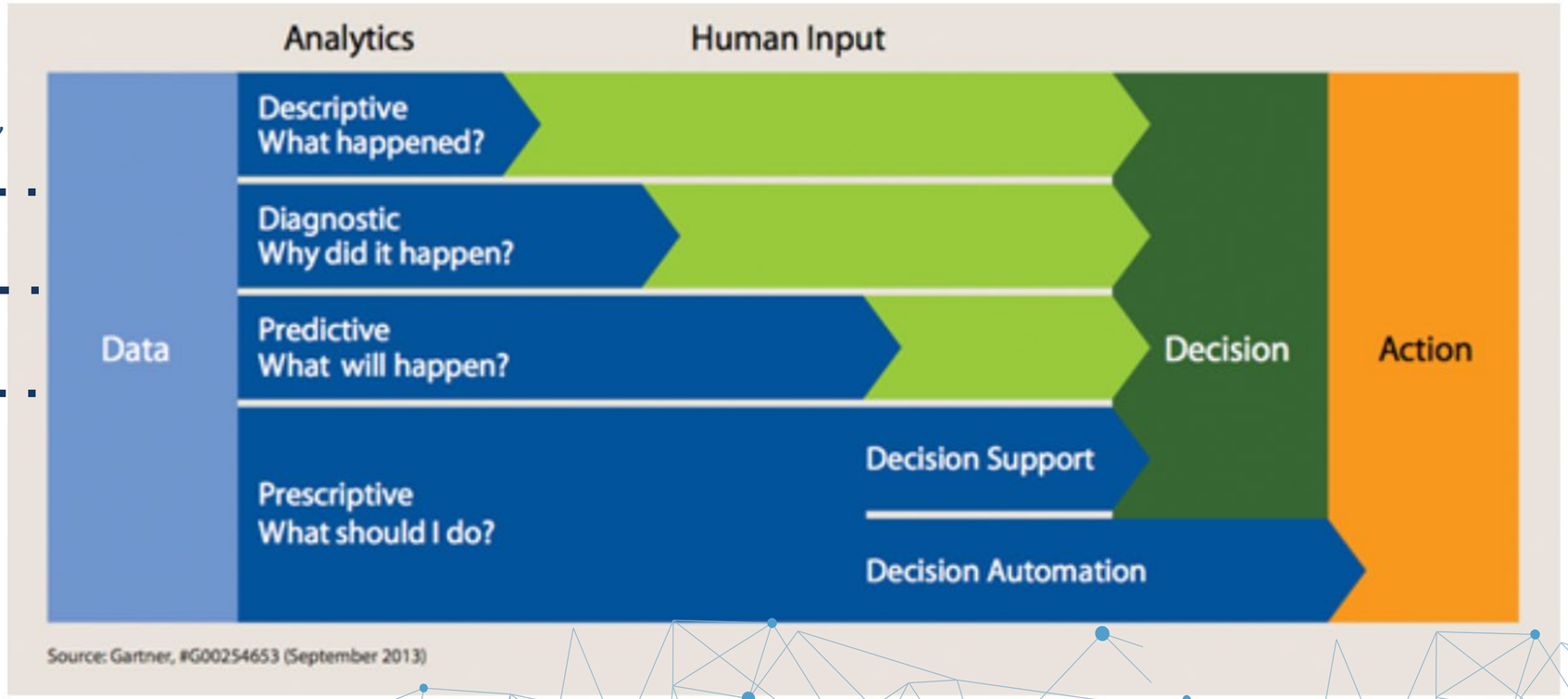
Key Points

Question Can multitask machine learning be used to better understand open surgical technique?

Findings This study presented a multitask neural network for visual understanding of open surgeries and introduces a data set used to train the model. It illustrated the utility of the model to generate procedure-specific signatures and identify kinematic elements of surgical skill from prospectively collected videos.

AI's Role in Precision Education & Personalized Education ...

- Gartner Model: Analytics Spectrum



Tools: Bar charts, line graphs, pie charts

Tools: Root cause analysis, correlations

Tools: Regression models, machine learning

Tools: Optimized algorithms

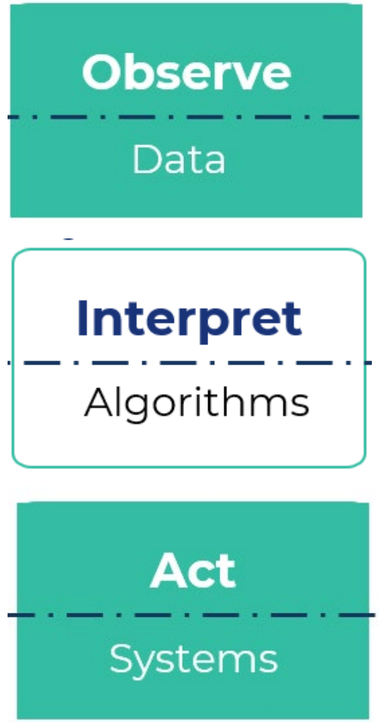
Observe
Data

Interpret
Algorithms

Act
Systems

❖ AI's Role in Precision Education & Personalized Education •••

- **Descriptive & Diagnostic Analytics**: Educators lead data analysis on student progress and class performance, using AI primarily for data organization and visualization support.
  - **Predictive Analytics**: AI forecasts outcomes, identifying at-risk students and improvement areas, while educators validate and guide interventions.
    - **Prescriptive Analytics**: AI recommends actions (e.g., personalized study plans), with educators focusing on implementation and ensuring alignment with educational goals.



Overall: AI shifts from supporting to driving decisions, enabling proactive, data-driven strategies in medical education while educators ensure contextual relevance.

AI's Role in Precision Education & Personalized Education ...

Could you explain this model in the context of medical education and comparing the role of educator and AI in each spectrum?

The **Gartner Analytics Spectrum** can be applied to medical education to illustrate how data-driven insights and AI can assist educators at various stages of teaching, assessment, and curriculum development. The role of the educator and AI shifts across the spectrum, moving from educator-led tasks in descriptive and diagnostic analytics to more AI-driven decision-making in predictive and prescriptive analytics.

1. **Descriptive Analytics** (What happened?)

- **Role of the Educator**:
  - In medical education, educators rely heavily on descriptive analytics to evaluate student performance. They gather and review historical data, such as exam scores, attendance rates, or feedback from evaluations.

Please make the key insights more concise and appropriate for a single slide presentation.

Key Insights (Concise for Slide Presentation):

- **Descriptive & Diagnostic Analytics**: Educators lead data analysis, using AI primarily for data organization and visualization support.
- **Predictive Analytics**: AI forecasts outcomes, identifying at-risk students and improvement areas, while educators validate and guide interventions.
- **Prescriptive Analytics**: AI recommends actions (e.g., personalized study plans), with educators focusing on implementation and ensuring alignment with educational goals.
- **Overall**: AI shifts from supporting to driving decisions, enabling proactive, data-driven strategies in medical education while educators ensure contextual relevance.

Complementary Roles of Human and AI ...

	Human	AI
Strength	Adaptability, empathy, critical thinking, social interaction	Handles large datasets, objective analysis and data processing
Weakness	Limited by data processing capacity, potential fatigue	Lacks empathy, struggles with human-like interaction and social context
+ Bias	**Naturally prone to favor information that supports one's preconceptions**	Can amplify existing biases if the training data is biased or incomplete

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AI's Role in Transforming Medical Education

Key Takeaways

- **AI as a Cross-Cutting Technology**: AI is recognized as a transformative tool that individualizes learning experiences while posing challenges related to balancing precision with ethical considerations.

- **Importance of AI-Powered Learning Tools**: AI-powered tools (virtual simulations, adaptive learning systems, and intelligent tutoring systems) are increasingly important for enhancing the quality and accessibility of medical education.

- **Imaginative comes with hallucination**: No hallucination → No imagination

- **Importance of keeping human in a loop**: LLMs and AI require human feedback to ensure accuracy, context, and ethical alignment.

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Thank You.

For Your Attention

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