Zyter TruCare

Multi-layered Reasoning
A Breakthrough in Trust for AI Diagnostics



Why do physicians override AI?

Doctors override AI not out of resistance, but when it doesn't feel trustworthy. Lack of confidence, poor explanations, or results that don't fit the patient's case lead physicians to step in.

A New Framework for Trust



A study by *Dr. Yunguo Yu of Zyter|TruCare*, in collaboration with co-authors from *Mayo Clinic*, found that a

dynamic scoring framework significantly increased physician acceptance of AI recommendations when supported by confidence and transparency

How was the study conducted?

1. Framework Developed

The team developed a framework that combined three crucial elements.

- *AI Confidence Scores*
- *Semantic Similarity*
- *Transparency Weighting*

2. Actual Medical Cases Run Against the Framework

6,689 Cardiovascular Cases

from the MIMIC-III dataset.

Key Study Results

Overall Override Rate

Overall physician override rates dropped significantly when AI showed confidence and transparency

87% → 33%

Before *After*

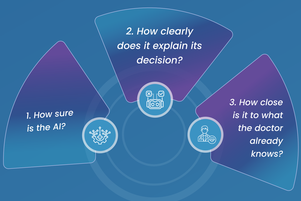
Overrides by Confidence Level

1.7% ***High Confidence*** override rate when AI expressed high confidence in the diagnosis.

99% ***Low Confidence*** override rate when AI expressed low confidence in the diagnosis.

How does the framework reduce overrides?

The framework acts like a filter. It looks at the AI's output and asks three simple questions before the recommendation goes forward.



Only if the answer checks out across all three does the AI's recommendation go forward. Otherwise, the framework pushes it back to the clinician for review. This way, doctors see AI as a helpful partner rather than a black box.

The new framework goes beyond traditional single-label AI evaluation by adding these capabilities:

Expert Role Simulation

Actionable Safety Measures

Confidence Scoring

Multi-layered Reasoning

Does this make AI more trustworthy?

Yes — this is the core breakthrough. By showing confidence levels, explaining reasoning, and leaving the final decision with the clinician, AI earns credibility. In high-confidence, transparent cases, doctors almost never overrode the AI — turning it from a "black box" into a "glass box."

Together, these features turn AI from a "black box" into a "glass box" that doctors can look into.

5 Ways the Framework Helps Physicians Trust AI

- ***Shows confidence levels*** — no more guessing.
- ***Explains reasoning*** clearly, not a mystery answer.
- ***Flags*** uncertainty for safe review.
- Uses ***plain, actionable*** language — no jargon.
- Logs every decision for ***full traceability.***

How is this unique compared to other frameworks?

Traditional AI Evaluation

- **Single-Label Accuracy** Focuses on a single "correct" answer (e.g., top-1 correctness).
- **Raw Prediction Focus** Judges based on predictions without assessing reliability or usability.
- **No Systematic Filtering** Lacks a structured way to filter diagnoses based on confidence.

This Breakthrough Framework

- **Multi-Candidate Diagnosis** Systematically incorporates multiple potential diagnoses.
- **Nuanced Assessment** Evaluates clinical reliability and usability, not just raw data.
- **Advanced Logic & Scoring** Includes expert role simulation, diagnostic logic, and confidence scoring.

In the near future...

This framework serves as a clinical safety net — ensuring AI innovation is always balanced with physician oversight. By making trust the benchmark, not just accuracy, we move closer to AI that clinicians and patients can truly rely on. To explore how this framework could be applied within your organization, connect with us today.

Access the Original, Peer-Reviewed Study in Diagnostics Magazine

Authors



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[In collaboration with researchers from Mayo Clinic]

Dr. Yu leads AI strategies to enhance healthcare outcomes, with an MD and a PhD in Computational Neuroscience and a track record in large-scale AI transformations. Dr. Yu has spearheaded large-scale AI transformations at prominent healthcare organizations including Mayo Clinic, Anthem, and CitiusTech.

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