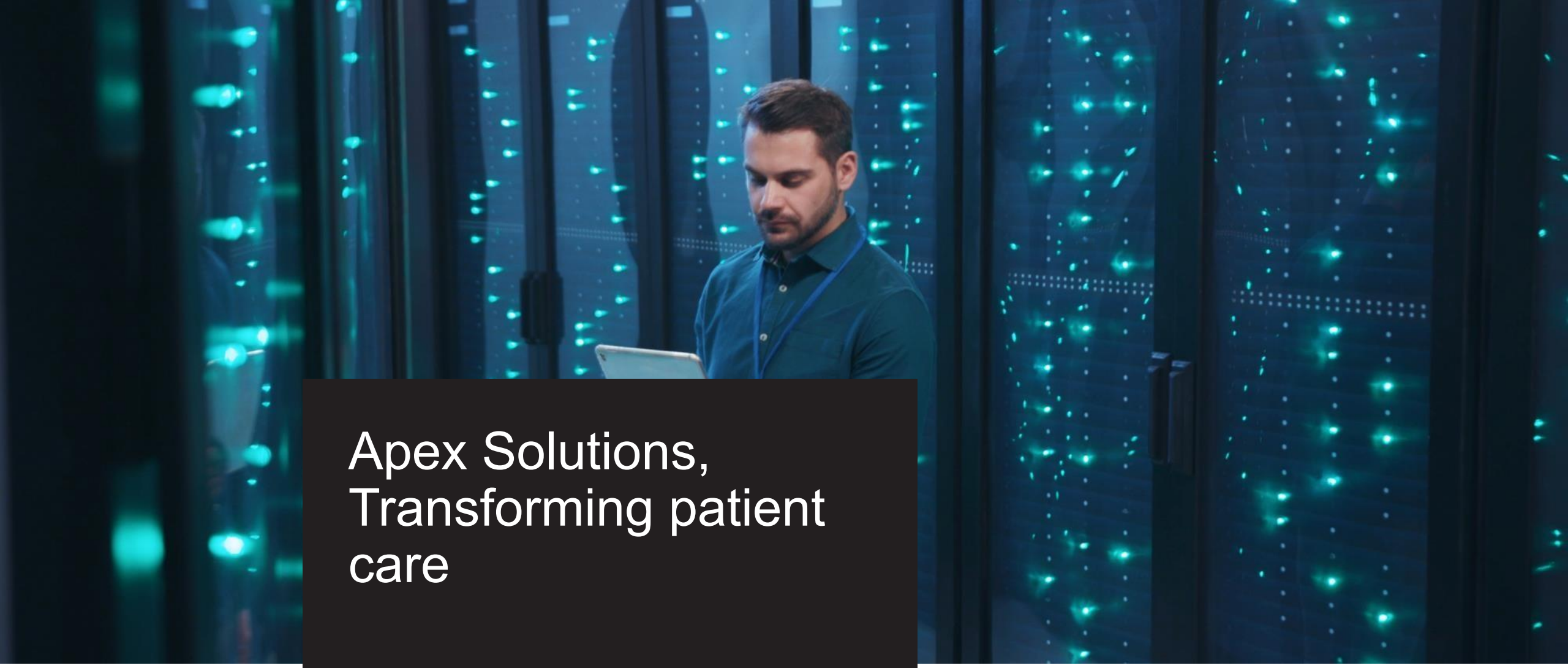

Apex Solutions, Transforming patient care

Dream
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September 27, 2025

Noah Mathew, Heinric Alfred Vijay, Nethan Binu

Agenda
Let’s get started

01 **Our Solution**
Our Problem Statement and Our Solution.

02 **The Three Pillars**
Addressing the Three Pillars of the UST Hackathon.

03 **Demo**
Demonstration of our optimizer.

04 **Future Implementations**
The scablilty and importance.

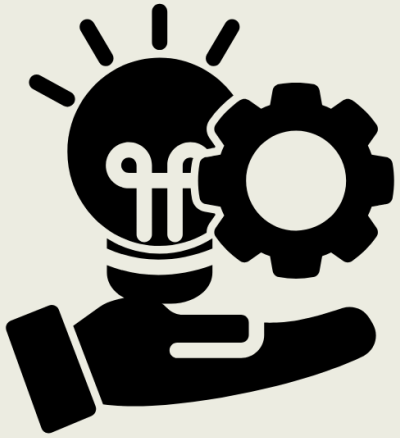
Problem Statement and Solution

Problem Statement

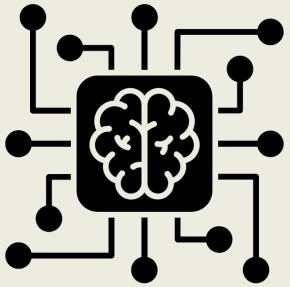
Hospitals and ERs face recurring issues: long wait times, staff burnout, uneven resource use, and lack of transparency for patients.

Solution

- Our Smart Healthcare Optimizer uses AI and quantum-inspired optimization to eliminate delays and ensure every patient is directed to the right doctor, room, and treatment instantly.
- By combining predictive models, ethical data sharing, and modern optimization, we forecast patient inflow, dynamically allocate staff/equipment, and fairly prioritize critical cases.
- This integrated, secure, and transparent system makes healthcare smarter, more efficient, and more sustainable — aligning with all three pillars of the UST Hackathon.



Three Pillars

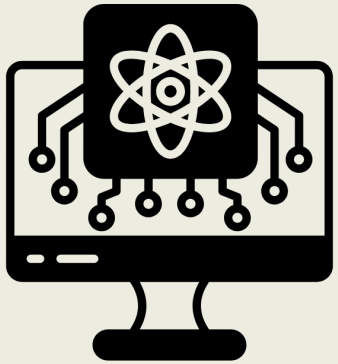


Integration of AI

Utilizing AI concepts to forecast whether there is busy traffic in time slots. In doing so, patients can choose an appropriate time and be seen promptly.

Data Ecosystems

Integrating and managing diverse healthcare data sources to provide a unified, real-time view, supporting smarter operational and clinical decisions.



Quantum Computing

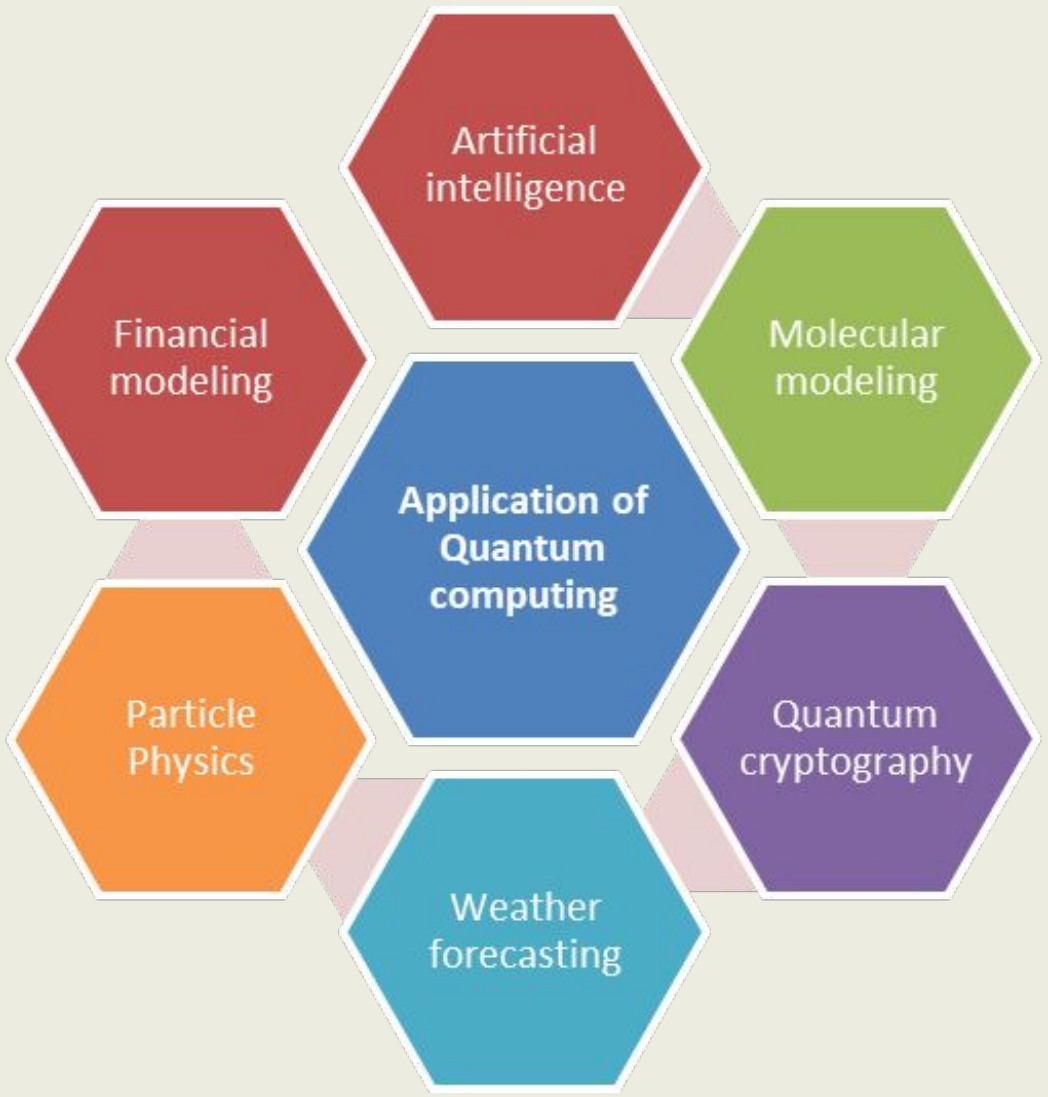
Rapidly assessing and prioritizing patients based on the severity of their conditions, enabling scalable and efficient scheduling decisions spontaneously.

Integration Of AI

Predictive Insights with Random Forest

- Uses Random Forest models to forecast patient severity and expected inflow.
- Helps prioritize patients dynamically based on predicted risk and urgency.
- Supports data-driven decisions for staff allocation and treatment planning.
- Integrates seamlessly with the quantum optimization layer for efficient triage.

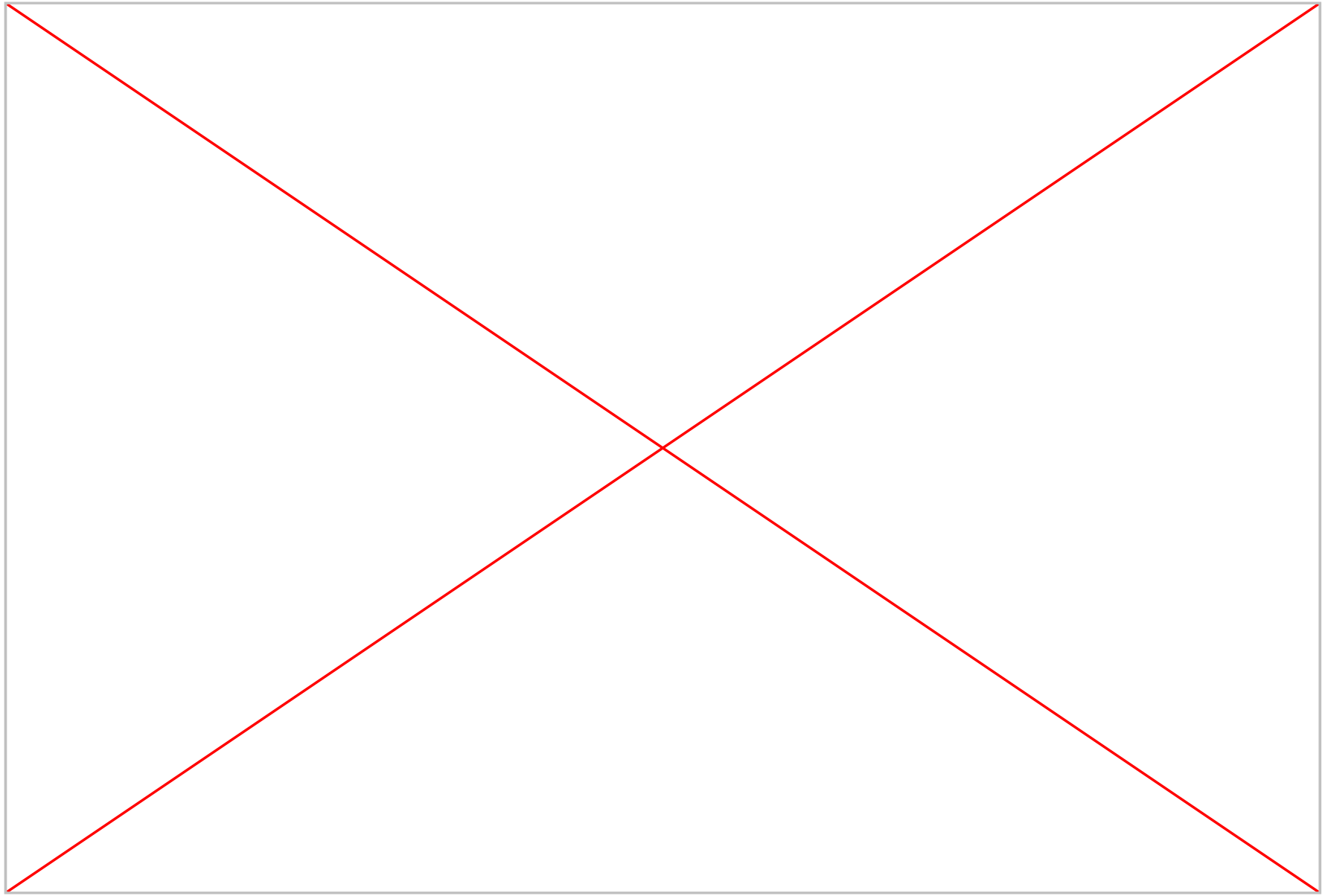
Quantum Computing



Grover-Based Optimization

- Grover's algorithm is used to efficiently find top-priority patients in large datasets.
- It offers quadratic speedup over classical search, making it faster and more accurate.
- Excels in highlighting critical cases where classical methods may take longer.
- Works together with AI predictions for optimal patient allocation and scheduling.

Demo



The Next Steps

Future Implementations

AI Transparency

Add transparency features showing patient prioritization. Build trust with staff and regulators using AI.

Scalability Testing

Simulate thousands of patients and dynamic conditions. Refine performance and reliability under high load.

Mobile Access

Develop mobile apps for clinicians and patients. Clinicians manage priorities and patients see wait times.

IoT Data Integration

Pull in vitals from wearables or bedside monitors. Dynamically adjust triage priorities based on data.

Together, we build for boundless impact

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UST
5 Polaris Way
Aliso Viejo, CA 92656

T +1 949 716 8757
F +1 949 716 8396

ust.com

Thank you