

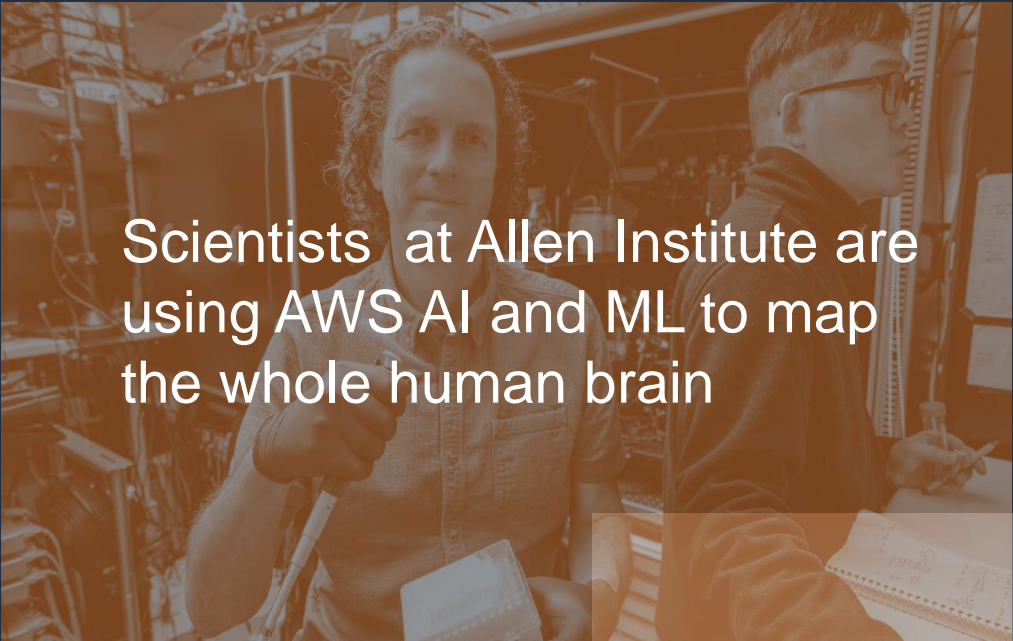


Modernise care using cloud accelerated ML/AI

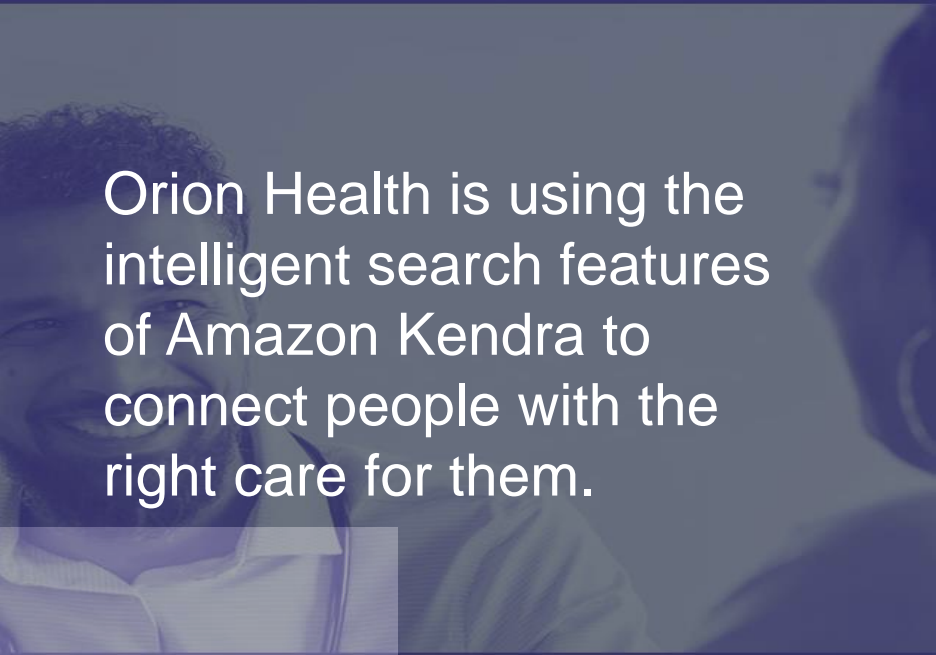
Mithil Shah

AI/ML Specialist Solution Architect
Amazon Web Services (AWS)


<https://www.linkedin.com/in/mit-hilcshah/>

A photograph of two scientists in a laboratory. A woman on the left is holding a pipette and a small container, while a man on the right is looking at a notebook. The background shows various lab equipment and shelves.

Scientists at Allen Institute are using AWS AI and ML to map the whole human brain

A close-up photograph of a man with a beard and glasses, smiling. The image has a blue tint.

Orion Health is using the intelligent search features of Amazon Kendra to connect people with the right care for them.

A photograph of a large, modern hospital building with a glass facade and a central courtyard. The image is in grayscale.

Gold Coast University Hospital Optimizes ICU Efficiency Through Datarwe Solutions Running on AWS and Intel

What is Artificial Intelligence and Machine Learning?



Artificial Intelligence is 'Intelligence – perceiving, synthesizing and inferring information – demonstrated by machines'

Machine Learning - part of Artificial Intelligence - A field of inquiry that uses data to 'learn' i.e. improve performance on set of tasks. Includes deep learning.



What is Cloud

On-demand delivery of IT resources
through the **Internet** with
pay-as-you go pricing



Segments

Providers - health systems, hospitals, academic medical centers



Payors - insurers, clearing houses and government agencies



Health Tech - healthcare IT companies and independent software vendors/ISVs

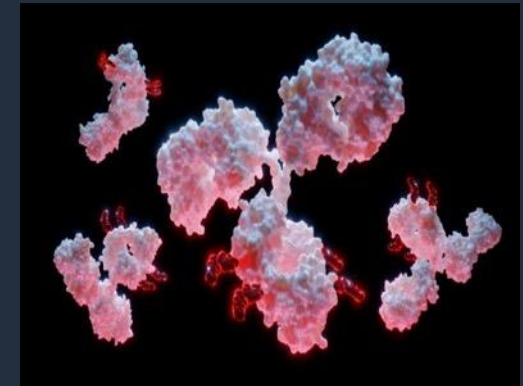


AI/ML use cases in Healthcare

Improve diagnosis and care

Accelerate drug discovery

Modernize care infrastructure



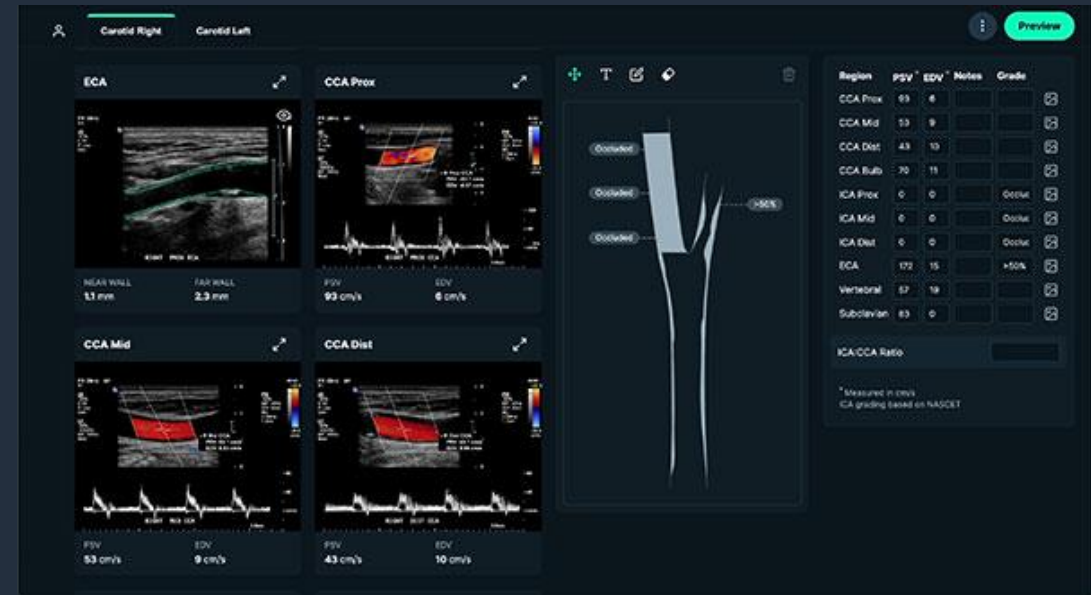


Improve Stroke Detection and Prevention

Augmented Vascular Analysis (AVA), is a medical AI software for automated analysis and reporting of vascular ultrasound scans

The startup is working with hospitals such as the Royal Melbourne Hospital in Australia, National University Hospital in Singapore, and the University of Washington in the US.

“With AVA running on AWS, we can analyze that load within seconds and return immediate results to the user.” **Dr. Milad Mohammadzadeh**
Cofounder and Director, See-Mode



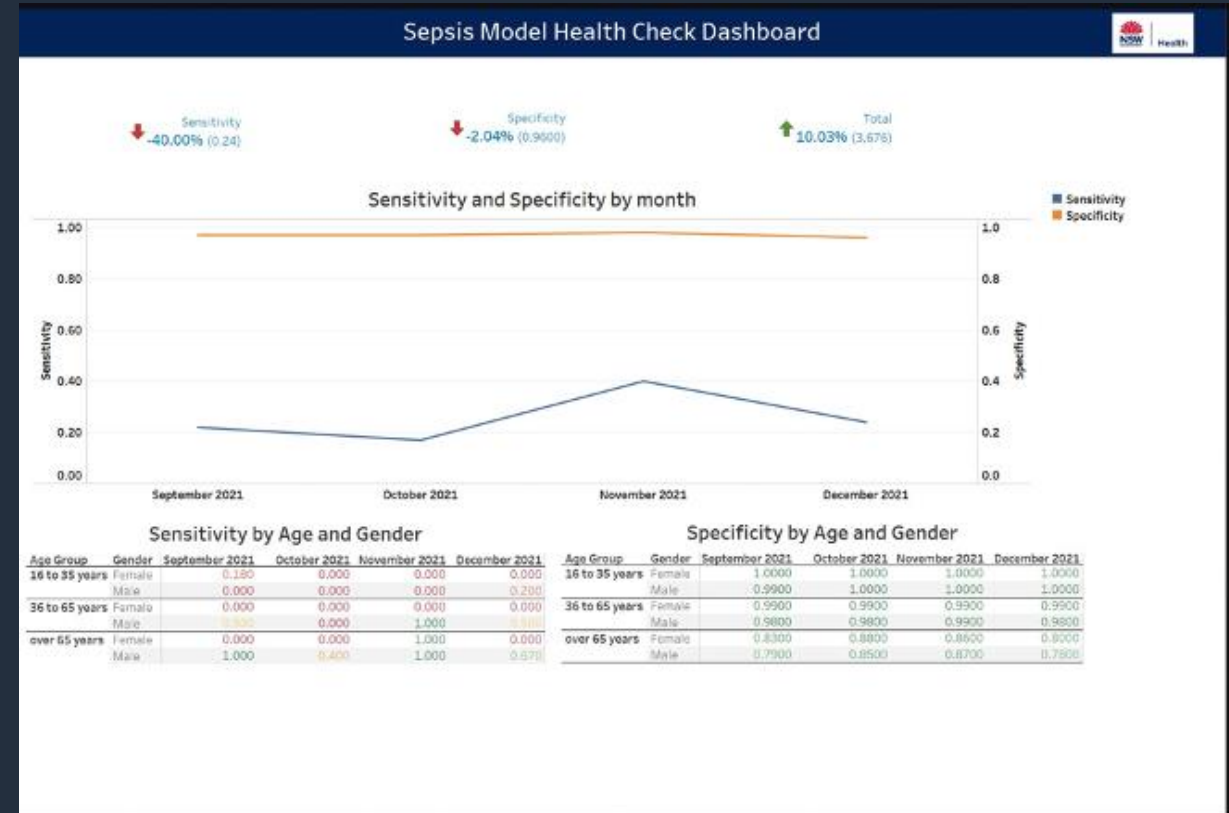


Proactive Sepsis Management

Sepsis occurs when chemicals released into the blood to fight an infection cause an inflammatory response.

AI Model identifies at risk patients in waiting room .

Ensemble model using Logistic Regression and XGBoost, vitals as feature : Age, Gender, O2 sat, BP, HR

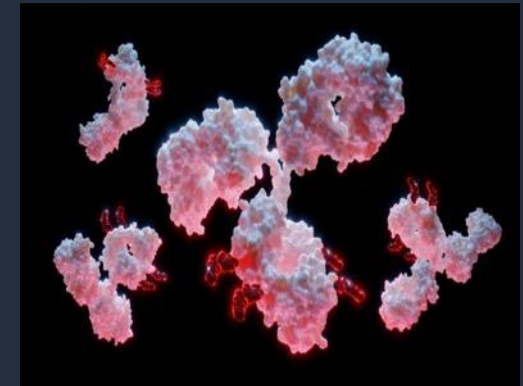


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Analyze Genomics Data

Help scientists more effectively cross wheat

“We pushed a total of about 3 terabytes of wheat exome data through the pipeline, utilizing 2,400 CPUs,” Dr. Nathan Watson-Haigh, research fellow in bioinformatics at the university’s School of Biological Sciences.

worked with technology partner [RONIN](#) to create a new HPC cluster based on the Amazon Web Services (AWS) Cloud.

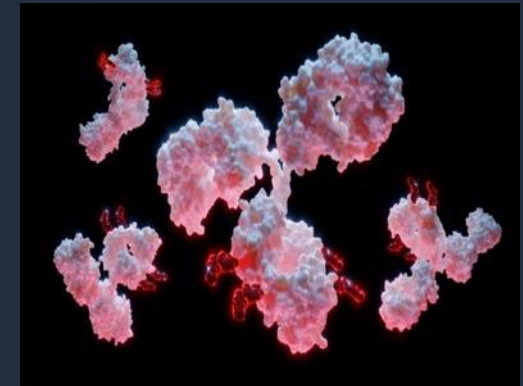


AI/ML use cases in Healthcare

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Medical bot using Generative AI

☰ **Medical Bot**[Medical Bot] ⓘ

This bot answers questions on Diabetes from CDC, Mayo, NIH and American Diabetes association. Try questions such as what is diabetes?

What is diabetes?

Diabetes is a chronic (long-lasting) disease that affects how your body turns food into energy. [<https://www.cdc.gov/diabetes/basics/index.html>]

What is the safe medication for diabetes?

metformin [<https://www.niddk.nih.gov/health-information/diabetes/overview/clinical-trials>]

What is the diet for diabetes?

A healthy diabetes diet looks pretty much like a healthy diet for anyone: lots of fruits, veggies, healthy fats, and lean protein; less salt, sugar, and foods high in refined carbs (cookies, crackers, and soda, just to name a few). [<https://www.cdc.gov/diabetes/managing/eat-well/what-to-eat.html>]

How do you treat diabetes?

I don't know 👍 👎

Hospital pre-admission form

To be completed by Patient
Please **PRINT** clearly. Your responses are valuable in planning your admission and caring for you during your stay.

Admission Details

Date of Admission: 28/02/2023
Admission Time: 4:30 PM
ADMITTING DOCTOR: DR. GEORGE
Admission Diagnosis / Procedure: STOMACH ACHE

Personal Details

Title: MR Surname: SHAH Previous Surname (if applicable) _____
Given Names: MITHIL Preferred Name: _____
Address: 1 KEAT STREET Suburb: SYDNEY State: NSW Postcode: 2032
Telephone: (Home) _____ (Business) _____ (Mobile) _____
Sex: Male Female Date of Birth: ____/____/____ Age: _____
Marital Status: Single Married De facto Separated Divorced Widowed
Occupation: _____
Are you an Australian Resident? Yes No Country of Birth: _____ If Australia, specify state _____
Are you of Aboriginal / Torres Strait Islander (TSI) descent? No, Yes, Aboriginal, Yes, TSI, Yes, both Aboriginal and TSI
Religion: _____ Do you wish to be visited by a member of your clergy? Yes No

Person to Contact (Next of Kin)

Name: _____ Relationship to patient: _____
Address: _____ State: _____ Postcode: _____
Telephone: (Home) _____ (Business) _____ (Mobile) _____
Email: _____

PRE-ADMISSION FORM

Form scanned using AI (not just OCR)

Amazon Textract > Analyze Document

Analyze Document [Learn more](#)

Choose a sample document, or upload your own, to view the result from the Analyze Document API.

admission [Search] [Refresh] [Close]

To be completed by Patient
Please **PRINT** clearly. Your responses are valuable in planning your admission and caring for you d

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Personal Details

Title: MR Surname: SHAH Previous Surname (if applicable):
Given Names: MITHUN Preferred Name:
Address: KEAT STREET Suburb: SYDNEY Sta:
Telephone: (Home) (Business) (Mobile)
Sex: Male Female Date of Birth: / / Age:
Marital Status: Single Married De facto Separated
Occupation:
Are you an Australian Resident? Yes No Country of Birth:
Are you of Aboriginal / Torres Strait Islander (TSI) descent? No Yes, Aboriginal Yes, TSI
Religion: Do you wish to be visited by a member of your e
Person to Contact (Next of Kin)

Raw text | **Forms**

Results

Search

Book.No.& MRN	Surname
Other Names	DOB / Sex
Ward / Doctor	Date of Admission:
Admission Time:	ADMITTING DOCTOR:
Admission Diagnosis / Procedure:	Title:

STOMACH ACHE



Contact Center Intelligence Use Cases



Self-service bots
&
virtual agents



Real-time call
analytics
and Agent Assist



Post-call
analytics

Responsible AI

“When Algorithms Discriminate

The online world is shaped by forces beyond our control, determining the stories we read on Facebook, the people we meet on OkCupid and the search results we see on Google. Big data is used to make decisions about health care, employment, housing, education and policing.

But can computer programs be discriminatory?”

—The New York Times, July 2015

“Machine Bias: There’s software used across the country to predict future criminals. And it’s biased...”

—ProPublica, May 2016

What is responsible AI?

Virtue

Example metric

Privacy & security



Is data used in accordance with privacy and legal considerations and protected from theft and exposure?

Fairness



Are there harmful disparities in system performance across subpopulations?

Explainability



Does the system offer a clear rationale for its decisions?

Sustainable



Does the AI system follow your sustainability goal?

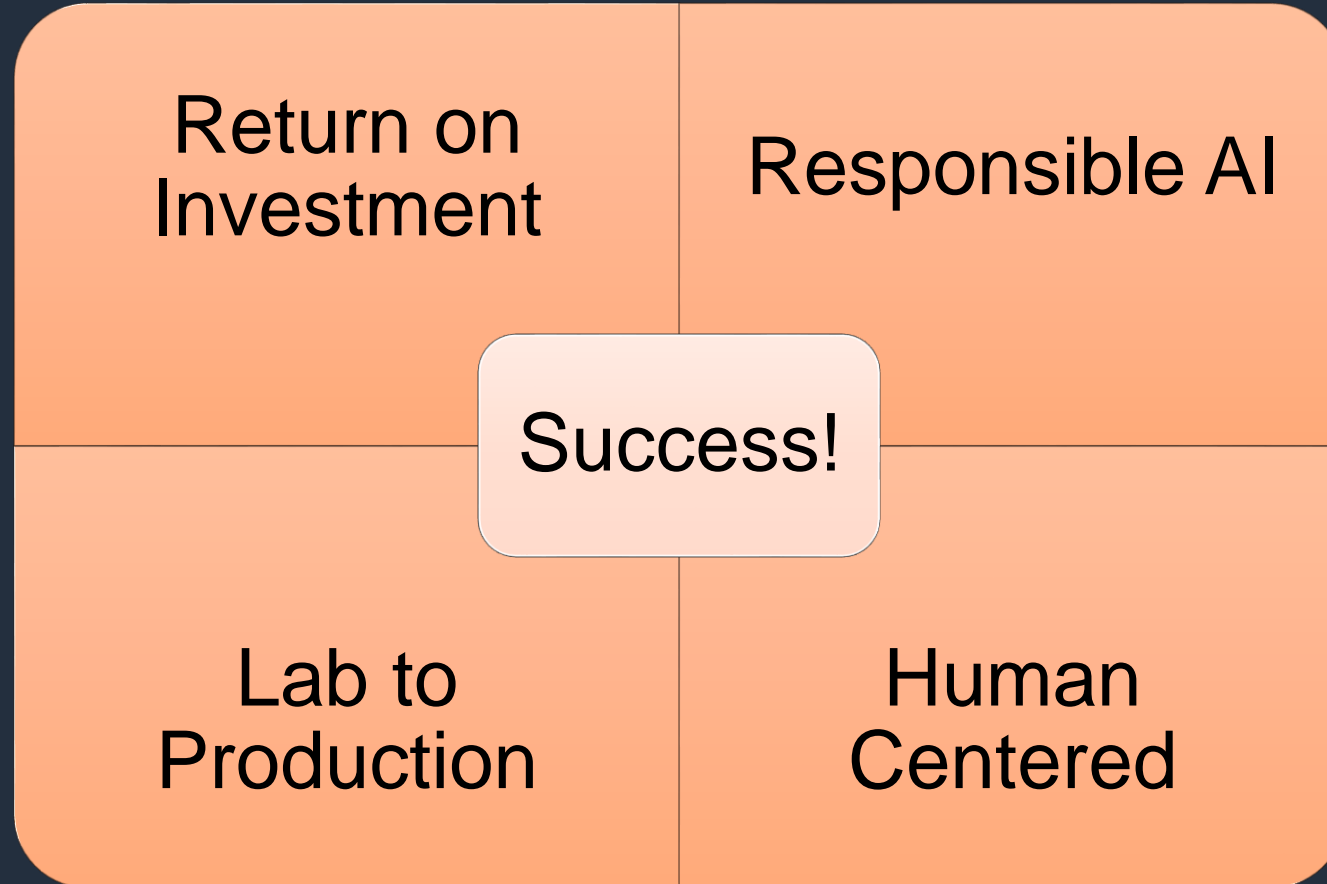
Transparency



Are users enabled to make informed choices about their use of the system?



Feasibility Matrix for AI/ML Project in healthcare



Thank you!

Mithil Shah

<https://www.linkedin.com/in/mithilcshah/>

