

Agentic AI for Research Data Management Platforms

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The AI Super-Cycle



Generative AI vs Agentic AI

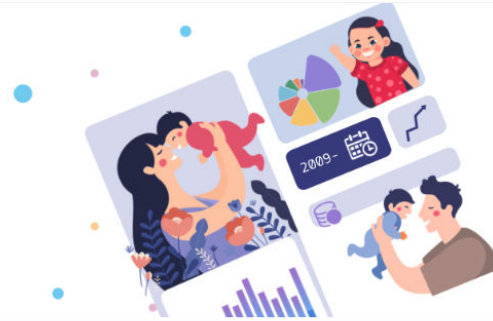
Category	Generative AI	Agentic AI
Core Purpose	Create or transform content	Take autonomous actions toward goals
Primary Capability	Pattern generation	Reasoning, planning, tool use
Typical Input	Prompt requesting content	Goal or complex instruction
Typical Output	Static content	Completed tasks or actions
Autonomy Level	Low	High
Memory & State Tracking	Usually stateless	Maintains context & plans
Tool / API Use	Limited	Native tool/API usage
Example Skills	Writing, images, code	Work automation, workflows
Best For	Creative tasks	Operations, complex reasoning

GUSTO Data Vault

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GUSTO Data Vault

Our data platform makes GUSTO/S-PRESTO research data, biospecimens and publications discoverable to researchers & policymakers. We aim to serve the global research community with knowledge representation and management.



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Singapore PREconception Study of long-Term maternal and child Outcomes (S-PRESTO) study is a major collaborative research effort involving partners across Singapore from healthcare and research alike. The S-PRESTO cohort study investigates pre-pregnancy influences on maternal and child health.

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Growing Up in Singapore Towards healthy Outcomes (GUSTO) study is a major collaborative research effort involving partners across Singapore from healthcare and research alike. This includes the National University of Singapore (NUS), KK Women's and Children's Hospital (KKH), and A*STAR's Institute for Human Development and Potential (IHDP). The purpose of GUSTO cohort study is to understand how conditions in pregnancy and early childhood influence the subsequent health and development of women and child.

[Ask GUSTO AI](#)

GUSTO Data Vault URL:
<https://gustodatavault.sg/>

Plotly Success Story on GUSTO Data Vault



Plotly
[@plotlygraphs](#)

When data science teams and domain experts work together, scientific discovery accelerates.

Singapore Institute for Clinical Sciences (SICS) knows the power of collaboration.

4:04 am · 23 Nov 2022

GUSTO Data Vault has more than **37 million data points** collected over **14 years**, with **23,000 active researchers & collaborators** accessing Data Vault globally across **69 countries and regions**.

GUSTO Data Vault - Publications

Publications

Explore GUSTO & S-PRESTO publications...

Collection

☒ GUSTO

☒ S-PRESTO

Domain

☒ Select All

☒ Demography/Cohort Profile

☒ Women's Health

☒ Maternal Metabolic and Body Composition

☒ Maternal Sleep, Personality and Mental Health

☒ Children's Health

☒ Child Metabolic and Body Composition

☒ Child Neurodevelopment

☒ Life Events & Social Relationships

☒ Paternal Factors

☒ Imaging

☒ Omics (Mother)

☒ Omics (Child)

☒ Omics (Father)

☒ Systems Biology

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Prospective prediction of childhood body mass index trajectories using multi-task Gaussian processes.

GUSTO Leroy, A.; Gupta, V.; Tint, M. T.; Ooi, D. S. Q.; Yap, F.; Lek, N.; Godfrey, K. M.; Chong, Y. S.; Lee, Y. S.; Eriksson, J. G.; Álvarez, M. A.; Michael, N.; Wang, D. - International journal of obesity (2005) - 2025

BACKGROUND: Body mass index (BMI) trajectories have been used to assess the growth of children with respect to their peers, and to anticipate future obesity and disease risk. While retrospective BMI trajectories have been actively studied, models to prospectively predict continuous BMI trajectories have not been investigated.

MATERIALS AND METHODS: Using longitudinal BMI measurements between birth and age 10 y from a mother-offs...

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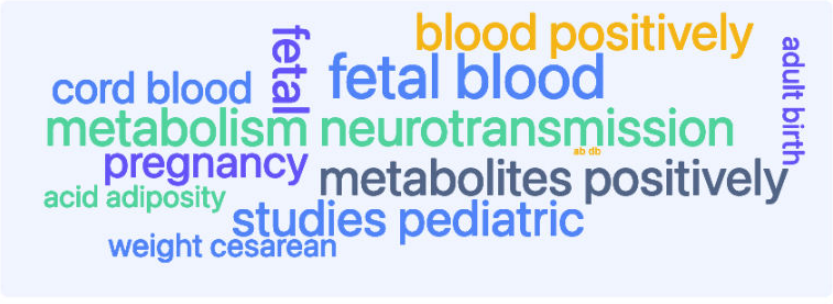
Linking obesity-associated genotype to child language development: the role of early-life neurology-related proteomics and brain myelination

GUSTO Huang, J.; Che, J.; Kee, M. Z.; Tan, A. P.; Law, E. C.; Silveira, P. P.; Pokhvisneva, I.; Patel, S.; Godfrey, K. M.; Daniel, L. M.; Tan, K. H.; Chong, Y. S.; Chan, S. Y.; Eriksson, J. G.; Wang, D.; Huang, J. Y. - eBioMedicine - 2025

We found an inverse association between polygenic risk for obesity, which is less susceptible to confounding, and language ability assessed at age 9. Our findings suggested a shared genetic basis between obesity and language development rather than a causal effect of obesity on language development. Interrogating early-life mechanisms including neurology-related proteomics and language-related white matter microstructure, we found that EFNA4 and VWC2 expressions were associated with language abi...

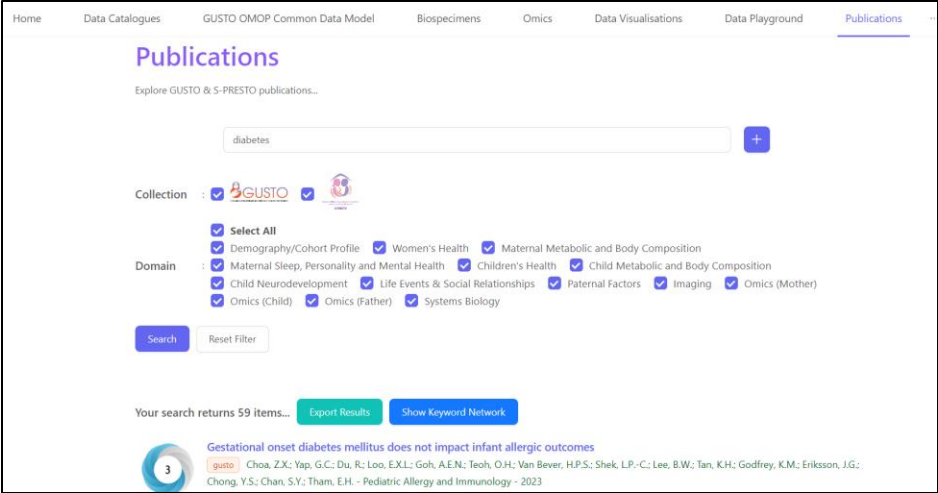
The Kynurenine Pathway Metabolites in Cord Blood Positively Correlate With Early Childhood Adiposity.	
Collection	GUSTO
Cluster	Child Metabolic and Body Composition
Publication Year	2022
Author	Tan, K. M.; Tint, M.; Kothandaraman, N.; Michael, N.; Sadananthan, S. A.; Velan, S. S.; Fortier, M. V.; Yap, F.; Tan, K. H.; Gluckman, P. D.; Chong, Y.; Chong, M. F. F.; Lee, Y. S.; Godfrey, K. M.; Eriksson, J. G.; Cameron-Smith, D.
Identifiers	- DOI: 10.1210/clinem/dgac078 - PubMed Id: 35150259
Citation	Tan, K. M. et al.(2022). The Kynurenine Pathway Metabolites in Cord Blood Positively Correlate With Early Childhood Adiposity.. <i>The Journal of clinical endocrinology and metabolism</i> , 107 (6), pp. e2464-e2473. doi. 10.1210/clinem/dgac078.
Full Text	Download/View Published PDF

Keywords

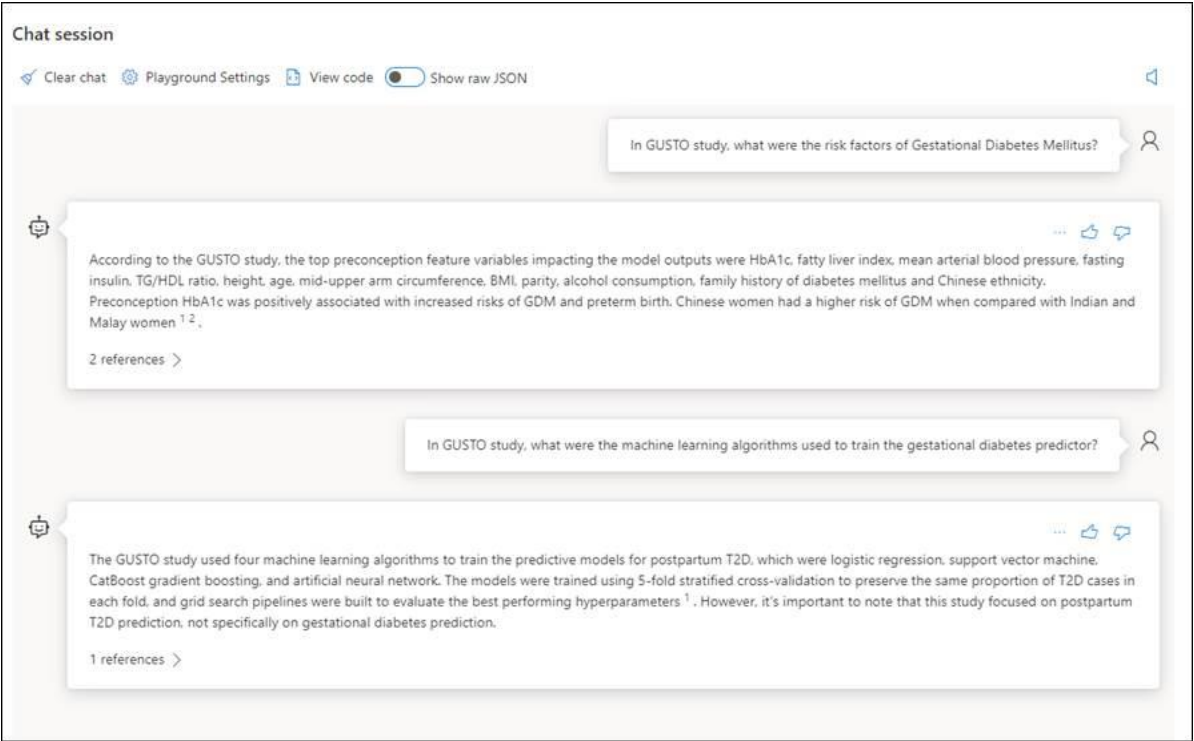


Enabling more than **400 publications** from the cohorts.

Evolution from Generative AI (2024): AI-assisted Question-Answering System for Research Literature



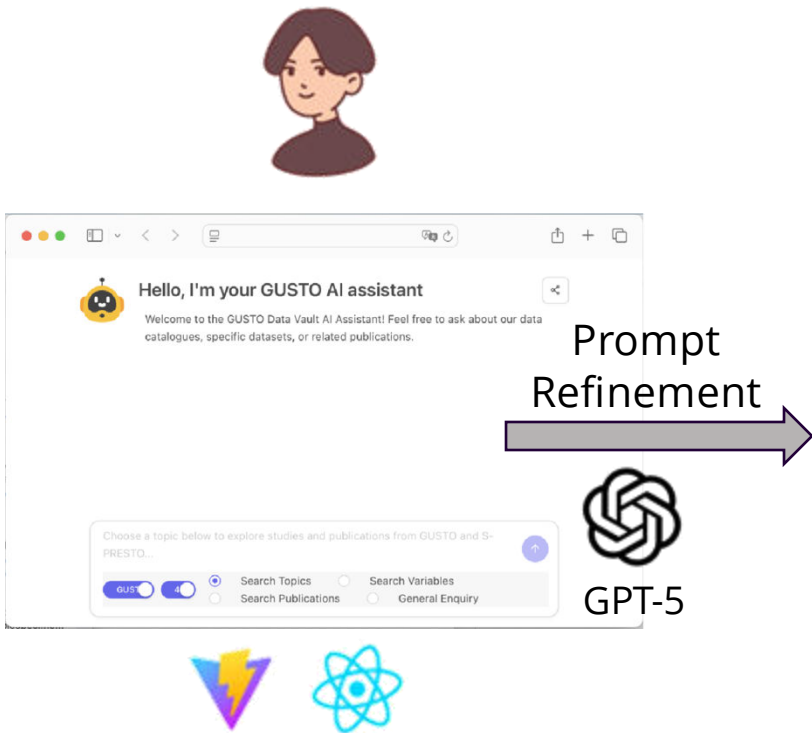
GPT-4 Turbo model was personalised with scientific publications from the GUSTO & S-PRESTO cohort studies.



Biodata & Digital

- Literature review was the most impactful strategic area identified by A*STAR's Generative AI Task Force for Research.

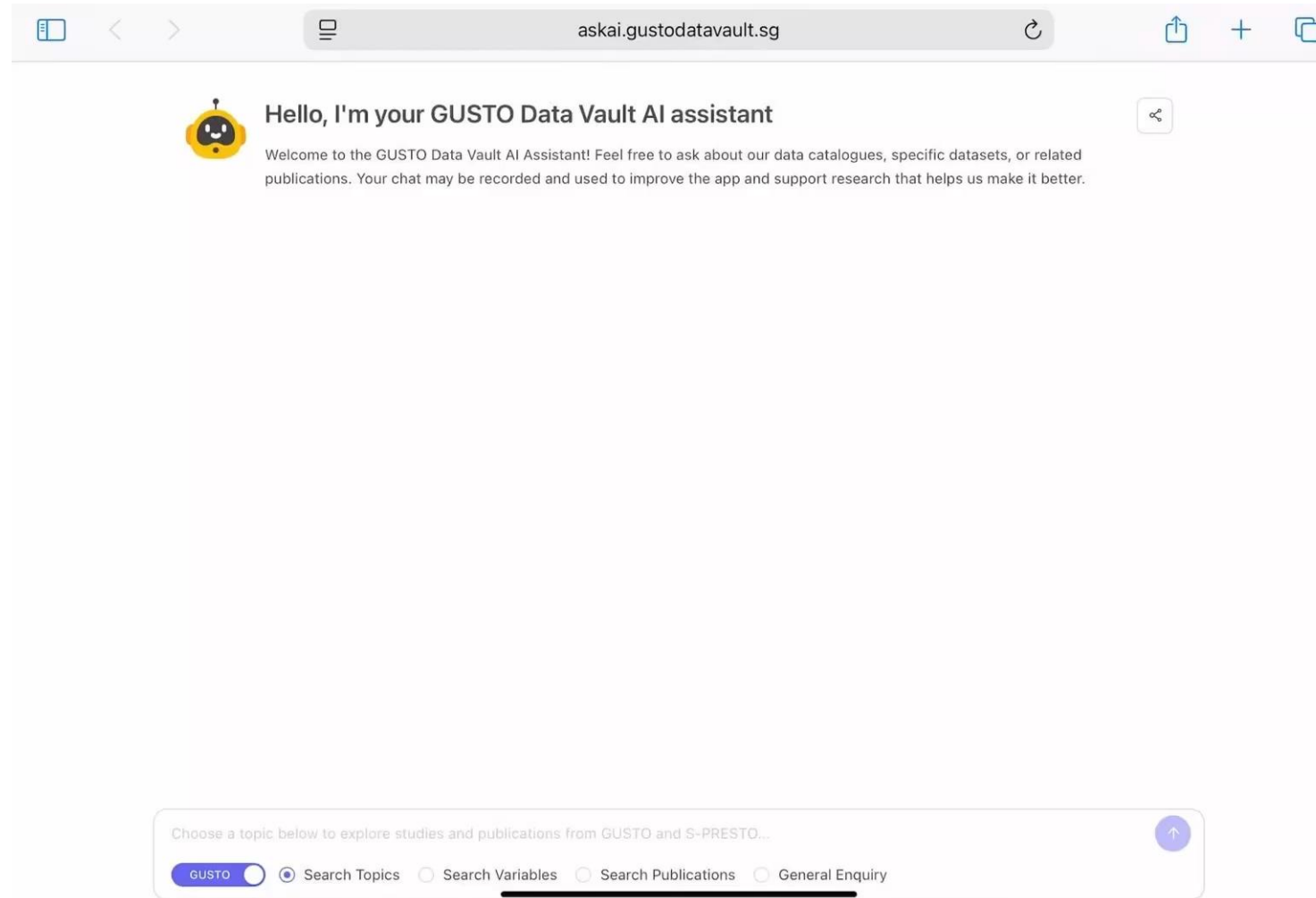
GUSTO AI: Multi-Agent AI System in GUSTO Data Vault (2025)



First enterprise-grade agentic AI system rolled at scale by A*STAR for **global researchers** and **collaborators**.

General	Topics/Studies	Variables	Publications
Semantic & Vector Search	Semantic & Vector Search	Semantic & Vector Search	Semantic & Vector Search
 Azure Cognitive Search	 Azure Cognitive Search	 Azure Cognitive Search	 Azure Cognitive Search
 Azure SQL	 Azure SQL	 Azure SQL	 Azure SQL
Documents	Data Catalogues	Data Catalogues	Metadata Full-text PDFs
Summary 	Summary 	Summary 	Summary 
GPT-5	GPT-5	GPT-5	GPT-5
	 Document Retrieval & Data Representation		 Reference List

GUSTO AI: Multi-Agent AI System in GUSTO Data Vault



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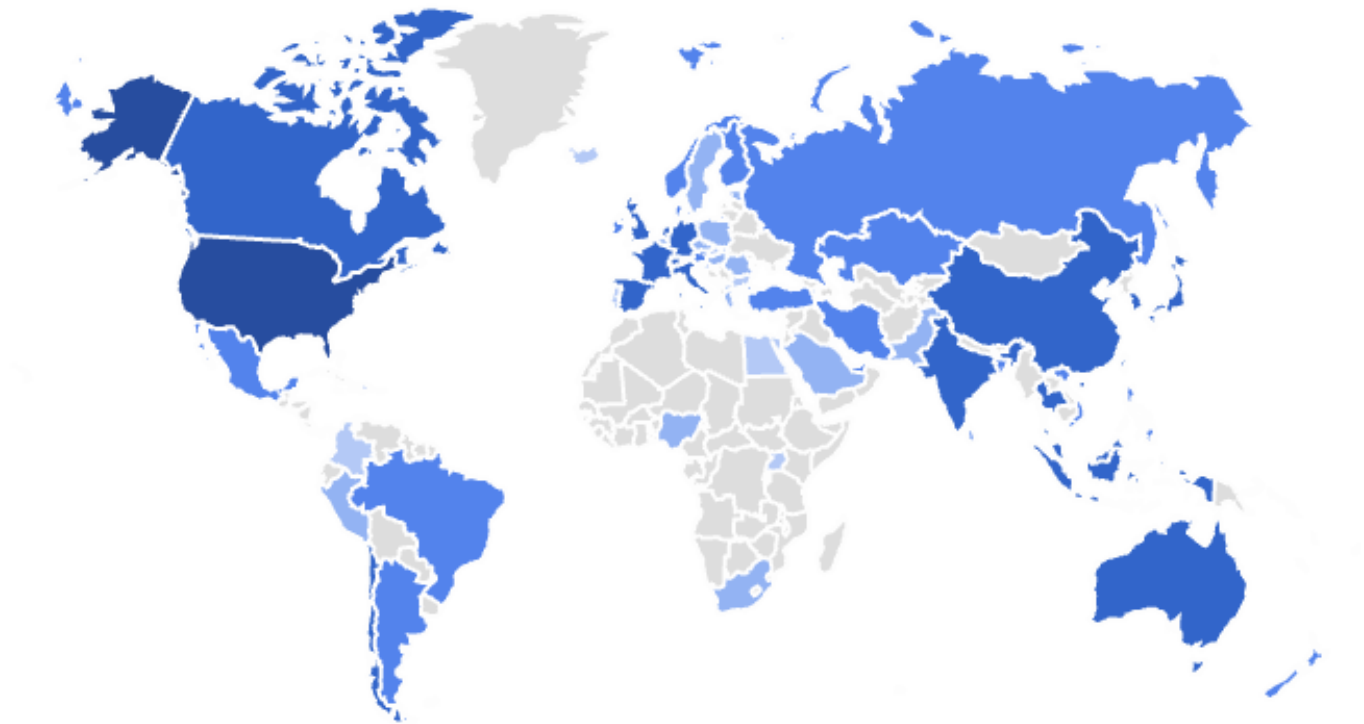
Global Impact of Data Vault

Top 15 Countries by Audience Reach

Country	% of Views
Singapore	63.99
United States	10.51
Netherlands	3.50
Qatar	2.60
China	2.59
United Kingdom	2.53
Chile	2.06
Hong Kong	1.86
Taiwan	1.60
Australia	1.42
India	0.86
Canada	0.83
Malaysia	0.72
Kazakhstan	0.69
France	0.55

*as of 14 November 2025

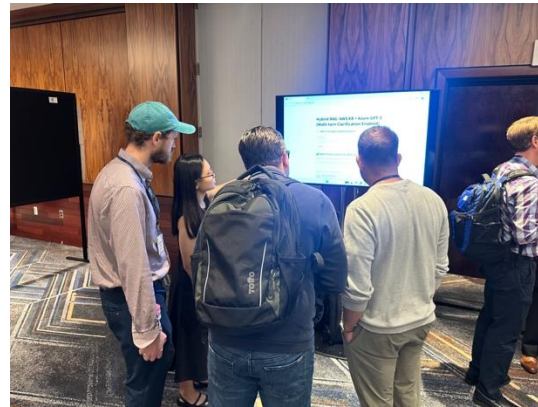
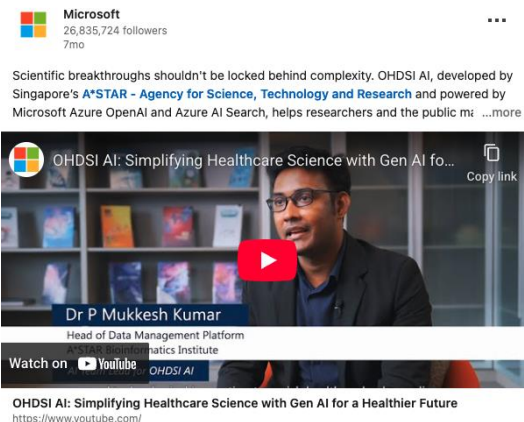
This year, the GUSTO Data Vault has attracted visitors from 69 countries and regions.



IMDA Agentic AI Special Award at the IMAGINE AI 2024



- The multi-disciplinary team of medical doctors and data scientists developed an AI agent for the management of post-surgical risk complications in patients planning for an elective surgery.
- By integrating AI with real-world data, the AI agent can assist in pre-surgical counselling, driving improved outcomes for the society.
- First in Asia-Pacific region to fine tune the OpenAI o1 flagship model with reinforcement fine-tuning and develop agentic AI frameworks.
- Integration of fine-tuned OpenAI Large Language Models in MOH TRUST Platform for real world AI validation using the National Electronic Health Records (NEHR).



TRUST

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AUTHORITY

OpenAI

Microsoft

OHDSI AI Showcased by Microsoft at World AI Tour and Microsoft YouTube Platforms, demonstrating A*STAR being at the forefront of Generative AI

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THANK YOU

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