




# AWS – Powering faster, greener, and more collaborative research

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*'In the spirit of reconciliation  
Amazon acknowledges  
the Traditional Custodians of  
country throughout Australia  
and their connections to land, sea  
and community.*

*We pay our respect to their elders  
past and present and extend that  
respect  
to all Aboriginal and Torres Strait  
Islander peoples today.'*

Tūtawa mai i runga,  
Tūtawa mai i raro,  
Tūtawa mai i waho,  
Tūtawa mai i roto,  
Kia tau ai te mauri tū,  
te mauri ora ki te katoa.  
Hāumi e, hui e, taiki e!

I summon from above, below,  
within, from the outside  
environment, to calm and  
settle the vital inner essence,  
the well-being of everyone,  
Be joined, together,  
united!

# Challenge

How can we achieve greater research outcomes faster, with more flexibility, and with less cost?

Too little water



Credit: NASA/JPL

<https://www.flickr.com/photos/kevinmgill/32087675568/in/photostream/>

# Too much water



Credit: Danella Bevis/The West Australian

<https://thewest.com.au/news/weather/perth-weather-several-suburbs-across-metro-area-hit-by-flash-flooding-ng-b881925795z>

# Welcome to the **New** Normal



# Never ✓ Welcome to the ~~New~~ Normal

# We need to accelerate the pace of innovation

Our approach should:

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Allow for instant experimentation



Lower the cost of failure



Enable rapid scale and iteration

# Ideas to Democratise Research

1. Democratise Data
2. Democratise Compute
3. Improve Predictions and Simulations
4. Enable Collaboration to Share Knowledge
- 5. Think: Sustainability**

# AWS Wants to Enable Researchers

- Collaborate easily with data and each other
- Resources should always be available and affordable on demand
- One size should not have to fit all !!!

# Assessing the ocean's health by monitoring shark populations by OCEARCH



Satellite data supports  
180 scientists of  
90 world wide institutions on  
23 research projects

# AWS enables researchers through:

- On-demand HPC, huge data lakes, device access, AI/ML
- Amazon Science
- Cloud Credits for Research
- Ease of use initiative
- Idea sharing
  
- And Sustainability

# Sustainability solutions are powered by data

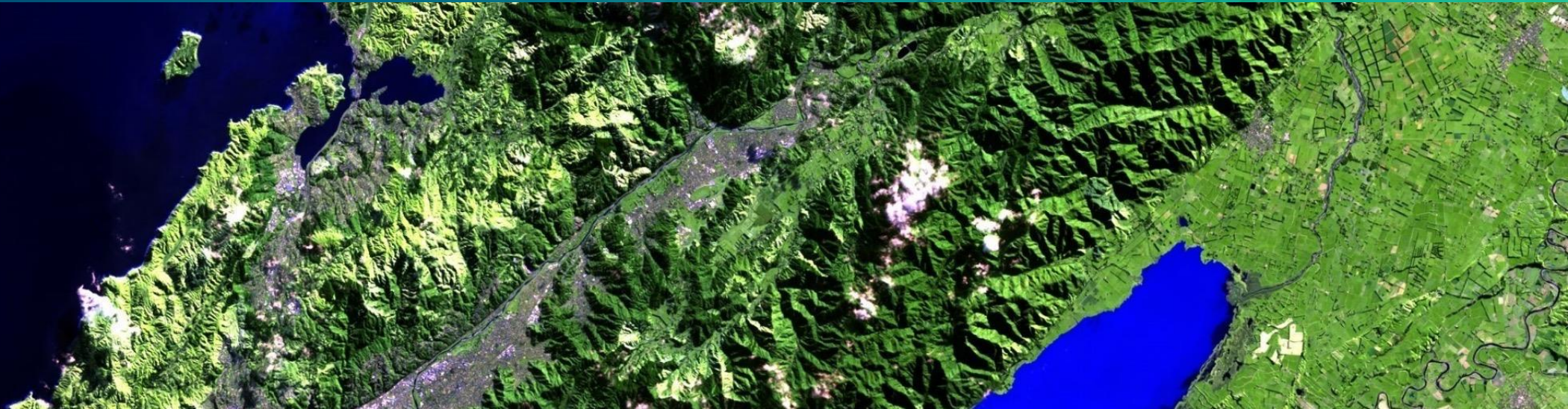
Data is diverse, growing exponentially, and used by many applications

AWS storage and analytics services and data programs can help

**Open Data  
Sponsorship  
Program**

**Amazon Sustainability  
Data Initiative (ASDI)**

**AWS Data  
Exchange**



Search water bodies

Darwin River Dam (Australia)

Darwin River Dam (Australia)

water body

2022-09-26


observation date

106%

surface area

178

total observations



# Blue Dot Observatory monitors at-risk bodies of water

- Uses ASDI and Open Data
- Uses Sentinel satellite data
- Automated
- Interactive and global
- Cost to process 1 month for 7,000 bodies of water: 6 EUR
- Total cost: 100 EUR/month

Global impact on shoestring budget

# Ideas to Democratise Research

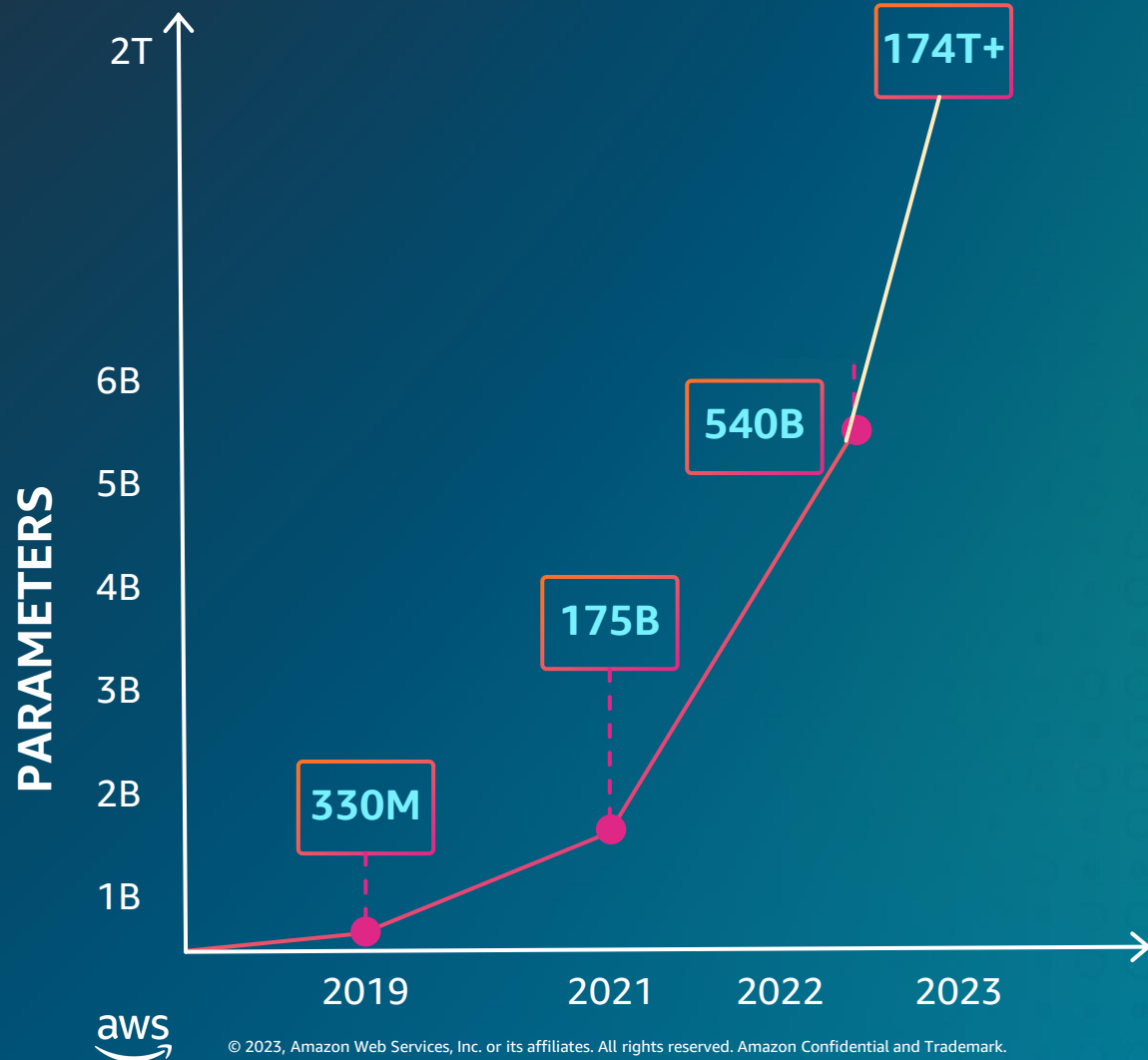
1. Democratise Data ✓
2. Democratise Compute ✓
3. Improve Predictions and Simulations ?
4. Enable Collaboration to Share Knowledge ✓
5. Think: Sustainability ✓

Innovation can  
**transform industries**



AI &  
GENERATIVE AI

# Model Sophistication - Rise of large models: Generative AI



2019–2023

**5,300x**

increase in model size measured  
by the number of parameters

# Use case examples

## Search, summarization and analysis

Improve literature documentation by automatically extracting and summarizing data and insights from documents.

## Code generation

Accelerate application development with automatic code recommendations based on the code and comments in your IDE

## Data augmentation

Generate synthetic data to train ML models, when the original dataset is small, imbalanced or sensitive.

## Report generation

Summarize data from various sources into actionable insights and perform comparative analysis on content

Unlock powerful insights from your data and enable every employee to make faster and better, data-driven decisions

# AI and Generative AI can help you at different steps in your research lifecycle



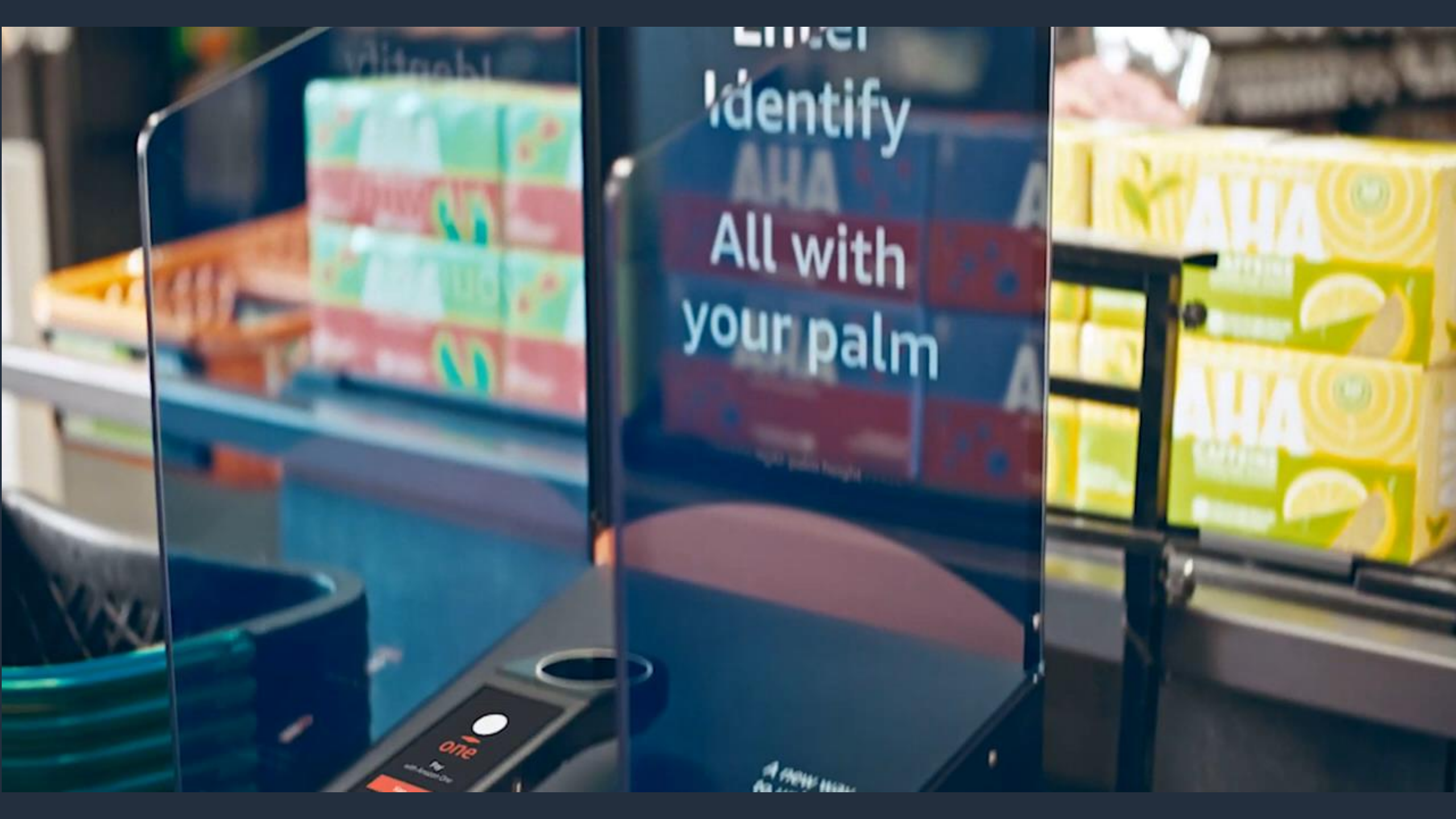
**Improve speed of research outcomes**

**with**

**scalable, secure, trustworthy, cost-efficient,  
and sustainable principles**

**even when**

**you don't have enough data**



Identify  
All with  
your palm

AHA  
AHA  
AHA

one

A new way  
to...

A portrait of Ed Lein, a man with curly hair wearing a light blue button-down shirt, standing in a modern, brightly lit interior space with blurred architectural elements and lights in the background.

**Ed Lein**

Senior Investigator, Allen Institute for Brain Science

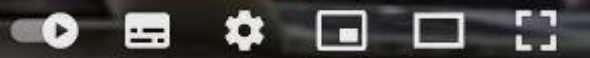




our development process 10  
times faster than before.



▶ ⏪ 🔊 1:49 / 2:04



# AWS: Building generative AI in a responsible way

**Our commitment to develop generative AI in a responsible way is integral to our approach**



Transform responsible AI from theory to practice



Integrate responsible AI into the end-to-end lifecycle of a foundation model



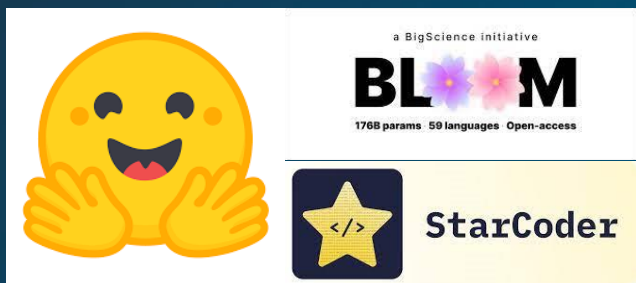
Prioritize education around how generative AI works and what are its limitations



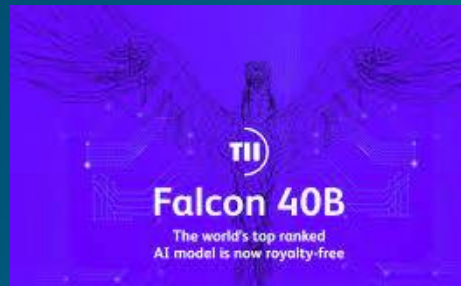
Advance the science behind developing generative AI responsibly

*To build generative AI that is safe, trustworthy, and sustainable*

# Large Models built in AWS with Amazon SageMaker



Hugging Face: [BLOOM](#) and [StarCoder](#)



TII: [Falcon](#)



Stability AI: [Stable Diffusion](#)



Bloomberg: [BloombergGPT](#)



Anthropic: [Claude](#)



AI21: [Jurassic-1](#)



LG: [EXAONE](#)

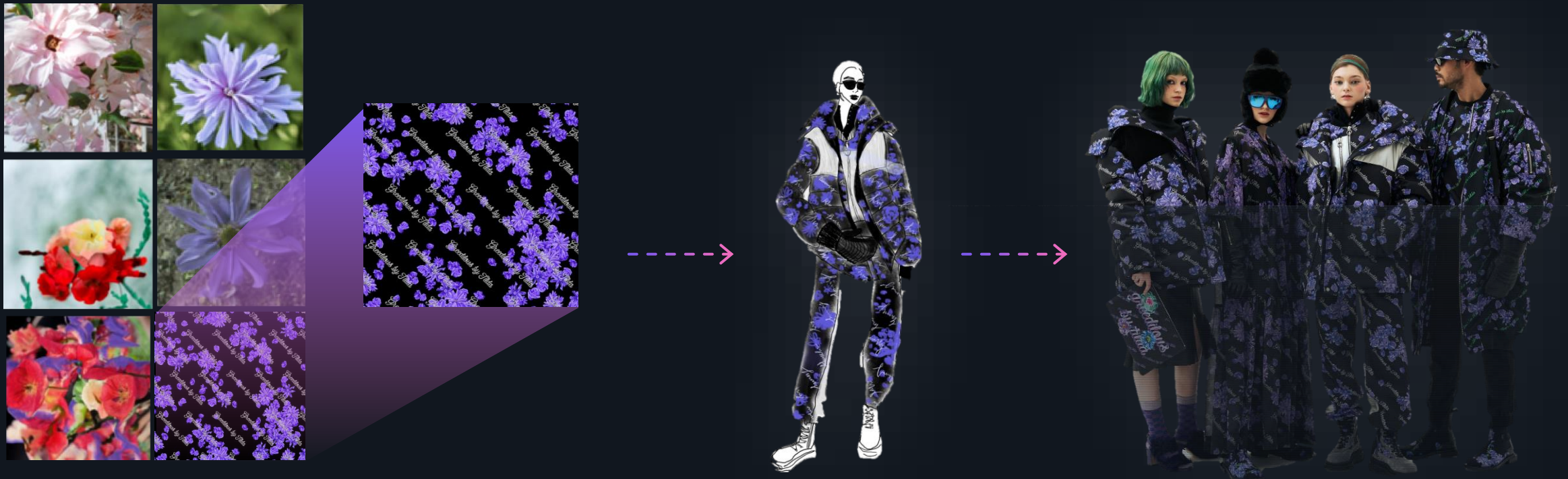


[Upstage AI](#)



Amazon: [Titan](#)

# LG AI Research was able to train the model faster by 59% with Amazon SageMaker, reducing CO<sub>2</sub> emissions



LG AI Research's Tilda, the AI artist powered by EXAONE

Everything you  
need to  
accelerate  
your AI &  
generative AI  
journey



## Easiest way to build

with leading foundation models



## Govern your data

in a secure and private environment



## Increase productivity

with generative AI applications and services



## Most performant, low cost

infrastructure to scale generative AI

# Amazon Research Awards

Researchers have leveraged Amazon Research Awards support to innovate faster using the most advanced tools available in the cloud.



## “Who we are shapes what we say and how we say it”

Staff writer  
July 05, 2023

Amazon Research Award recipient Shrikanth Narayanan is on a mission to make inclusive human-AI conversational experiences.

CONVERSATIONAL AI / NATURAL-LANGUAGE PROCESSING



## “Building a model that can save as many lives as possible”

Sean O'Neill  
May 24, 2023

How ARA recipient Supreeth Shashikumar is using machine learning to help hospitals detect sepsis — before it's too late.

MACHINE LEARNING



## Cracking the code of how diseases affect the body

Sean O'Neill  
May 15, 2023

ARA recipient Marinka Zitnik is focused on how machine learning can enable accurate diagnoses and the development of new treatments and therapies.

MACHINE LEARNING



# Closing

What can we do to create  
**disruptive innovation?**

How can we **make the world a  
better place?**





eratos

Modernize research,  
sustainably with AWS and Eratos

Come chat to us at Booth #6

# Thank you!

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