

Exploring the Generative AI Landscape

From Basics to Hands-on
Applications

Raghav Bali,
Staff Data Scientist
Delivery Hero



Agenda

- **What** is Generative AI ?
- What's All This **Hype** ?
- GenAI across Domains
- Is It for You/Your Organization?
- Agents of **Change**
- Quick Demo (Retrieval Augmented Generation)
- Limitations: System 1 Vs System 2 Thinking



Raghav Bali

Staff Data Scientist @ Delivery Hero



Delivery Hero
2022 - Present



Optum
2017 - 2022



Intel
2015 - 2017



American Express
2014 - 2015

A decade-long journey of pioneering enterprise-level solutions.

Harnessing Machine Learning, Deep Learning, Computer Vision, NLP and Recommendation Systems

Generative AI with Python and TensorFlow 2

Harness the power of generative
models to create images, text,
and music



Joseph Babcock
Raghav Bali

Packt

Publications

Multiple **patents** in the field of mixed reality,
deep learning, CV, NLP and Healthcare

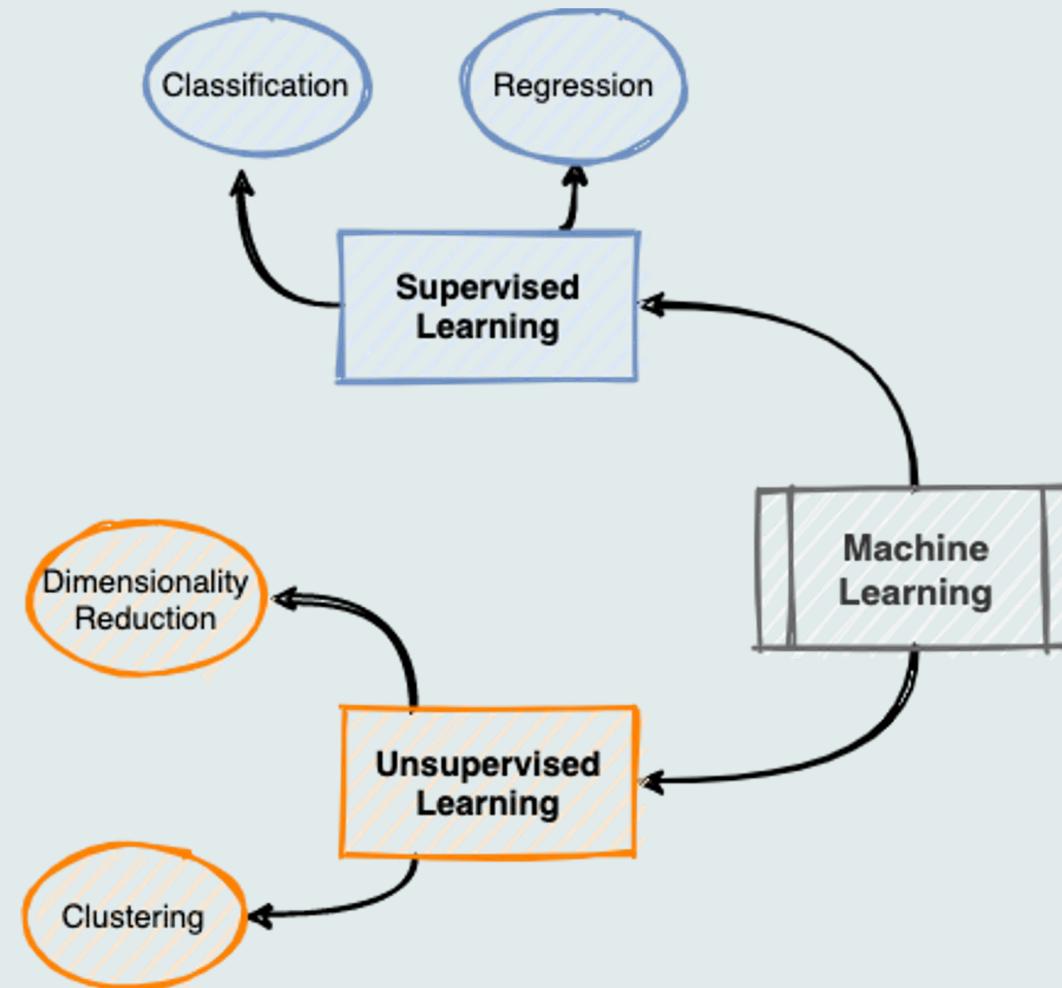
A number of **papers** at peer-reviewed
conferences

Well received **books** on
Generative AI, NLP, Transfer Learning and
more...



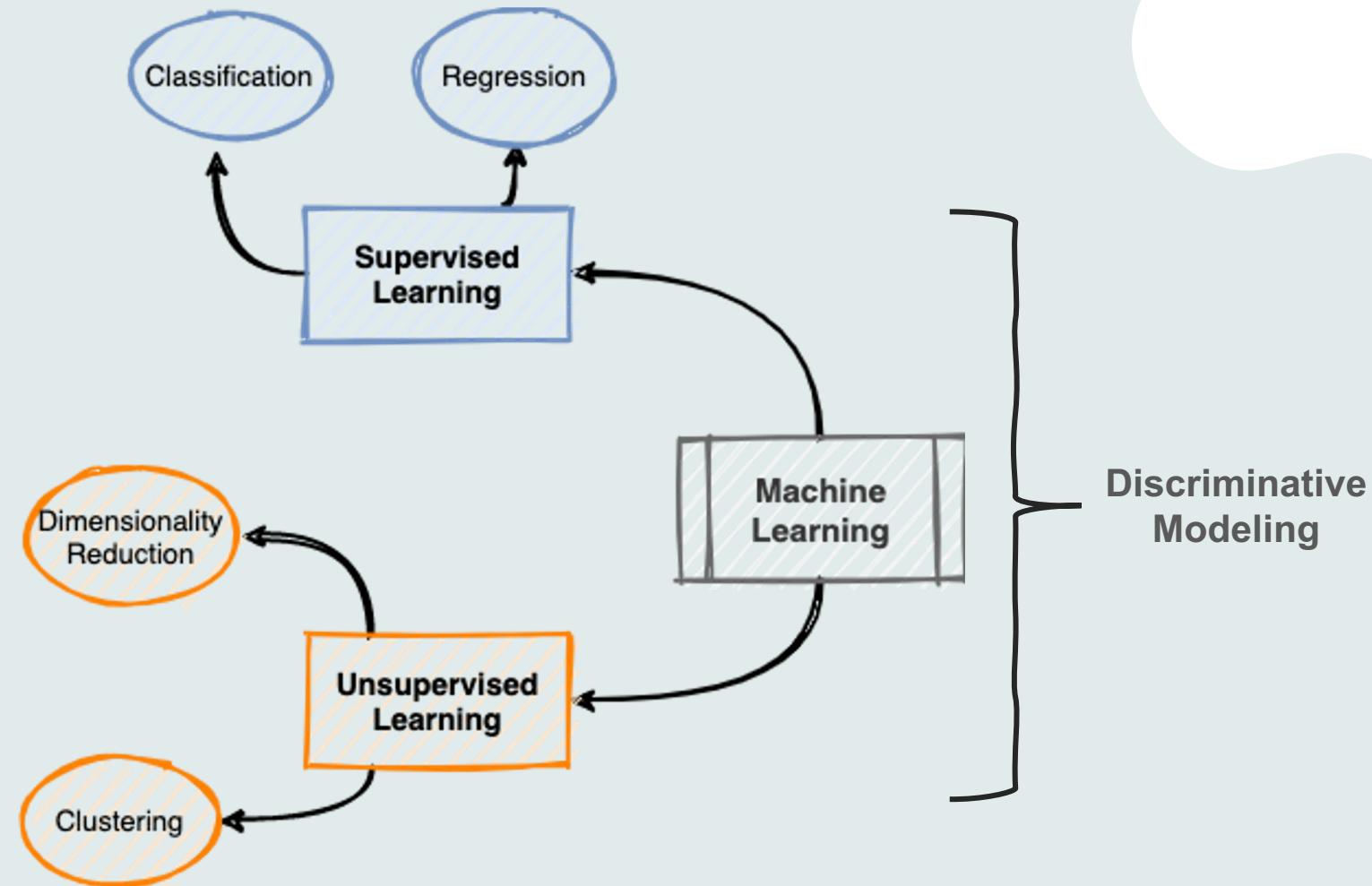
What is Generative AI ?

- **Supervised**
 - Regression
 - Classification
- **Unsupervised**
 - Clustering
 - Dimensionality Reduction



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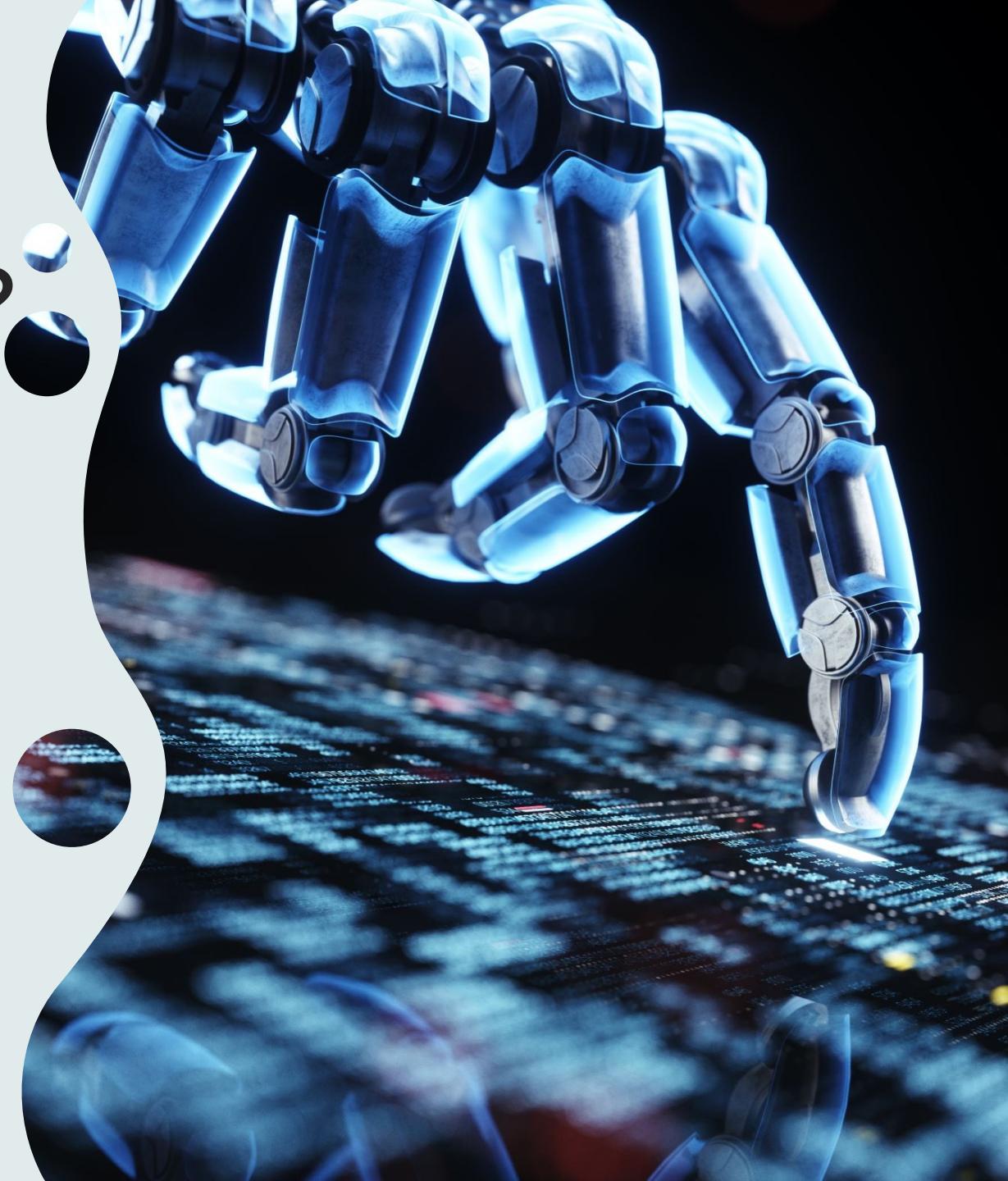
What is Generative AI ?

- Generative models are a class of models in the unsupervised machine learning space
- These help us model the underlying distributions responsible for generating the dataset under consideration

“There is tremendous amount of data easily accessible in most cases. Generative models analyze and understand such datasets”

What's All This Hype ?

- Amazing Capabilities
- No Code Tech Setup
 - Consumer Grade and Widespread Accessibility
 - Quick Turn-around and Fun
- Tech Side
 - Benchmarks out of the park
 - Accelerated funding & focus



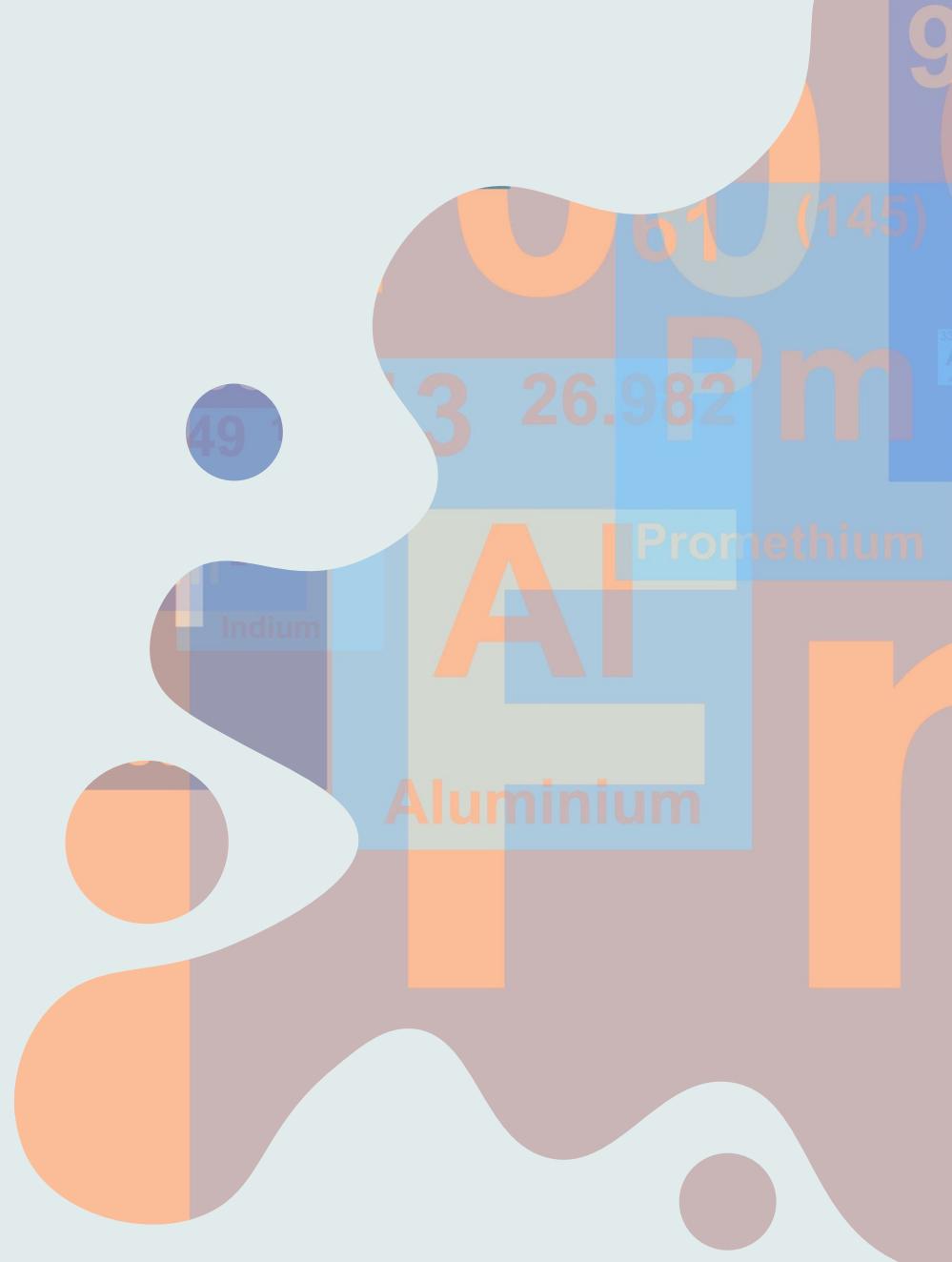
What's All This Hype ?

- **Productivity**

- Copilots for creative writing, coding, debugging, etc.
- Learning concepts, summarization and more
- Automation

- **Creativity**

- Democratize creative content
 - Logo creation, background music, art covers, etc.
 - Fast / Iterative improvements/modifications
- Content Creation
 - Digital art/posters, music, videos



GenAI Domains

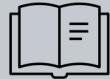


GenAI Domains



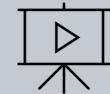
Computer Vision

- **Style Transfer, Denoise, Super Resolution, Segmentation**
 - GANs, VAEs
 - Stable Diffusion
- **Diffusion based Models**
 - Text 2 Image
 - Image 2 Image
 - Image In & Out Painting



NLP

- **Language Modeling:**
 - Seq2Seq
 - BERTs, GPT, GPT 2, T5
- **Instructions/Prompts:**
 - GPT3.5, GPT4
 - MosiacML, Falcon



Audio/Video

- **Speech 2 Text (prior 20???)**
 - Proprietary Models
 - Large clean datasets
 - WaveNet, WaveNet2
- **Whisper**
- **Text 2 Video | Image 2 Video**



Multi-Modal

- Google MuM
- GPT4
- Meta ImageBind
- VRDU

Is GenAI for You ?



End-User

Be vary of the limitations (hallucinations)
Be careful about license requirements of
the models/services
Be mindful of the data used for training
Large Models are expensive, keep an
eye on those credits/API costs



Product/Company/Institution

Weigh the Infrastructure requirements
vs Benefit
Do not forcefit/ride the hype

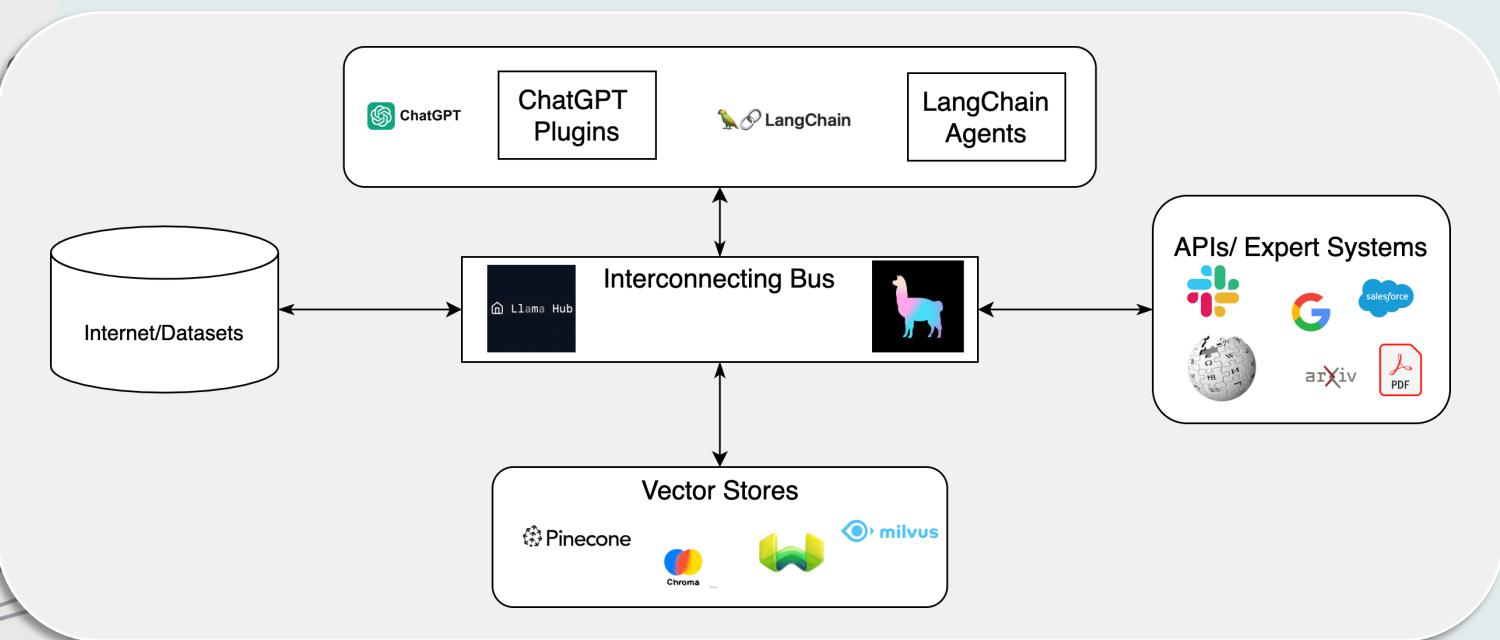
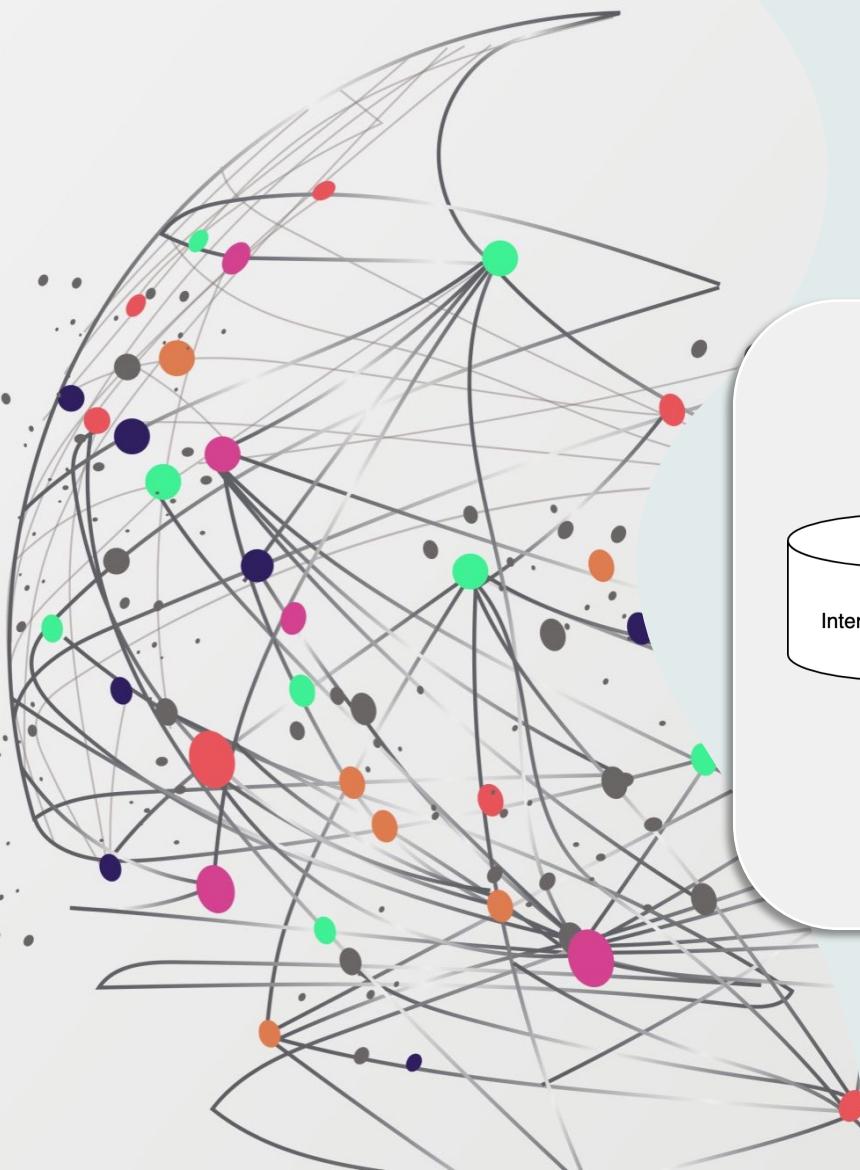


Ethical Dilemma and Biases

Agents of Change



Agents of Change



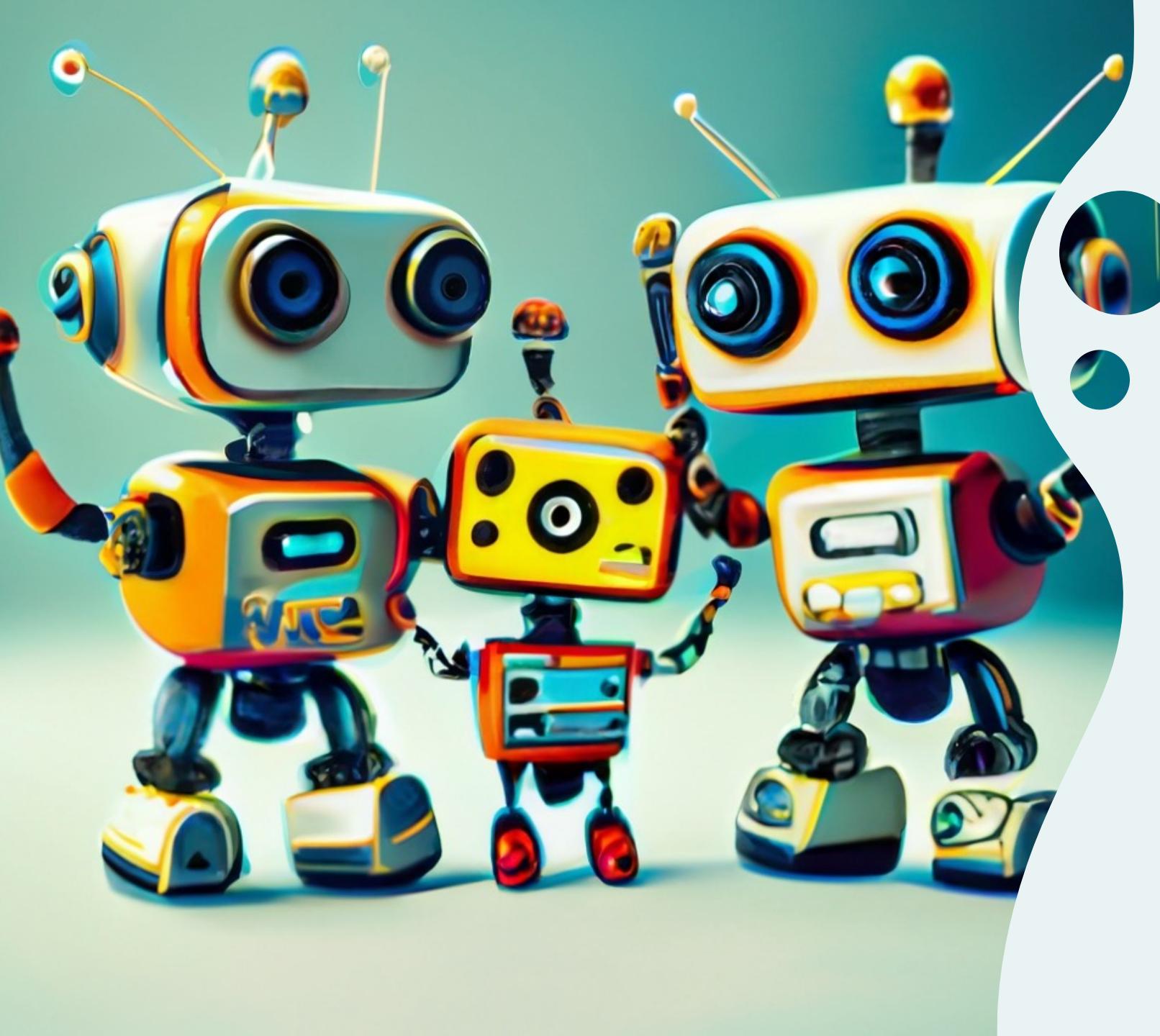
Generation AI Powered APP

Demo Time



Limitations/Challenges

- Hallucinations
- Prompts are more art than science
- Huge Infrastructure Requirements
- Prompt Attacks
- Memorization and Ethical Issues



Thank You

Raghav Bali