

# 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 (GenAI Powered App)
- Limitations/Challenges



# Raghav Bali

Staff Data Scientist @ Delivery Hero



Delivery Hero  
2022 - Present



Optum  
2017 - 2022



Intel  
2015 - 2017



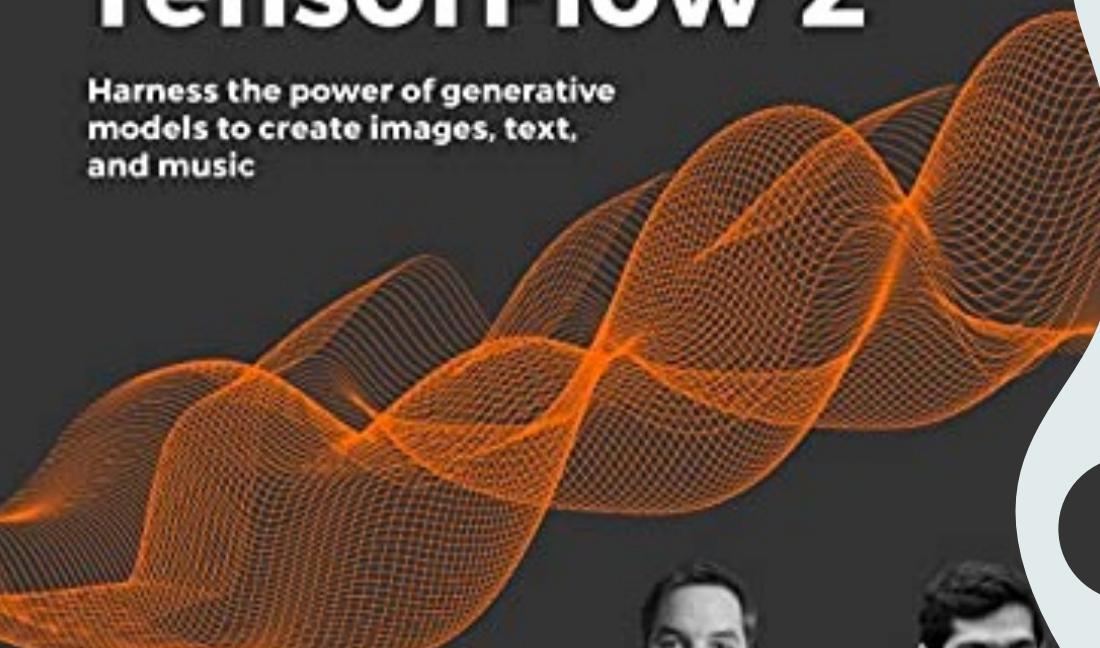
American Express  
2014 - 2015

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

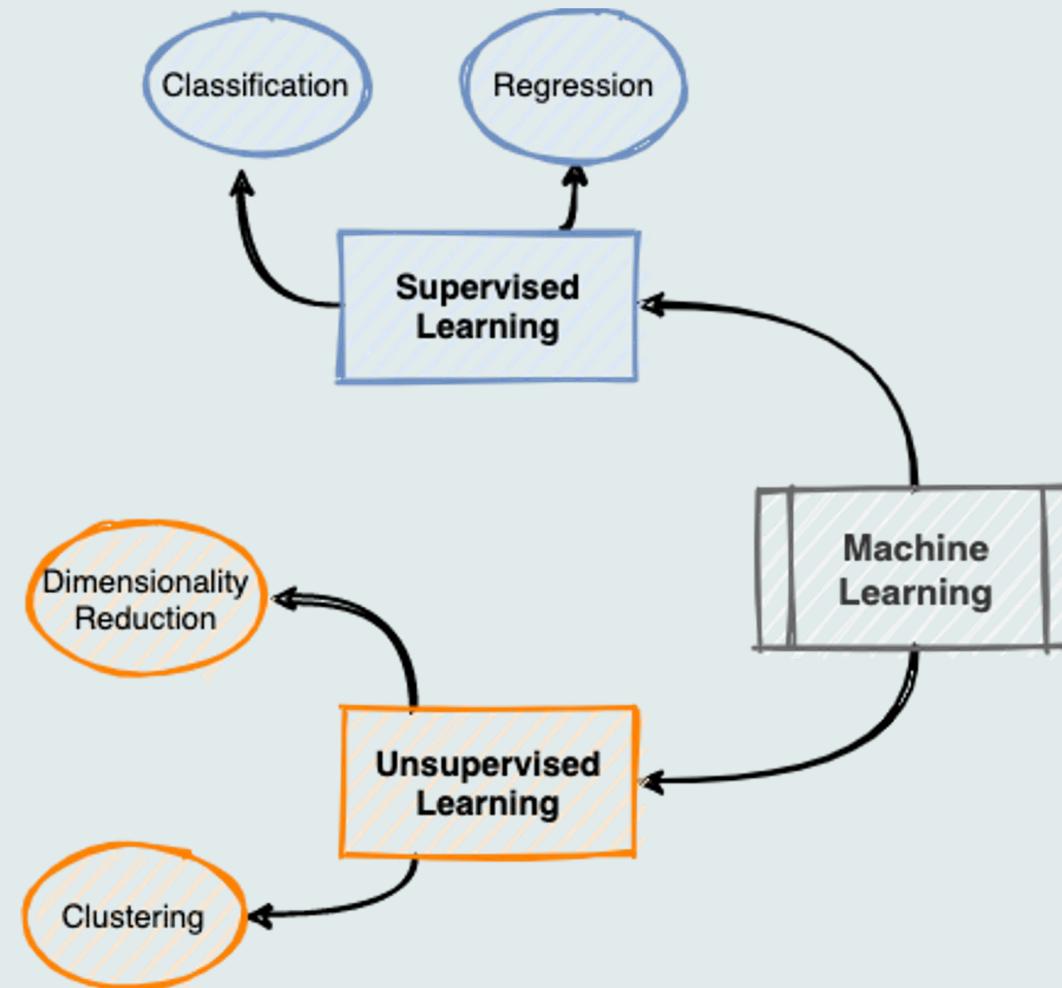
A number of **papers** at peer-reviewed  
conferences

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



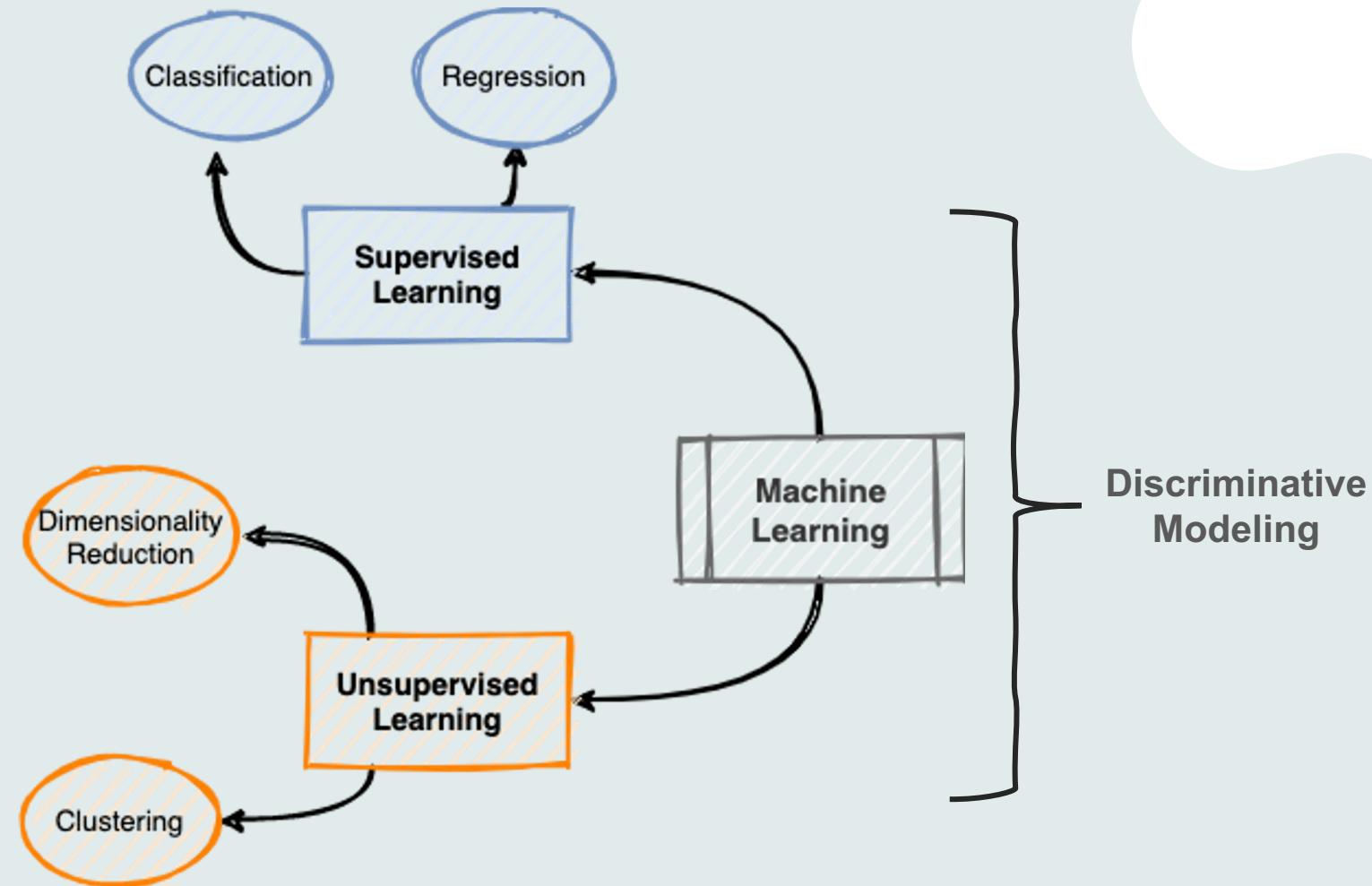
# What is Generative AI ?

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



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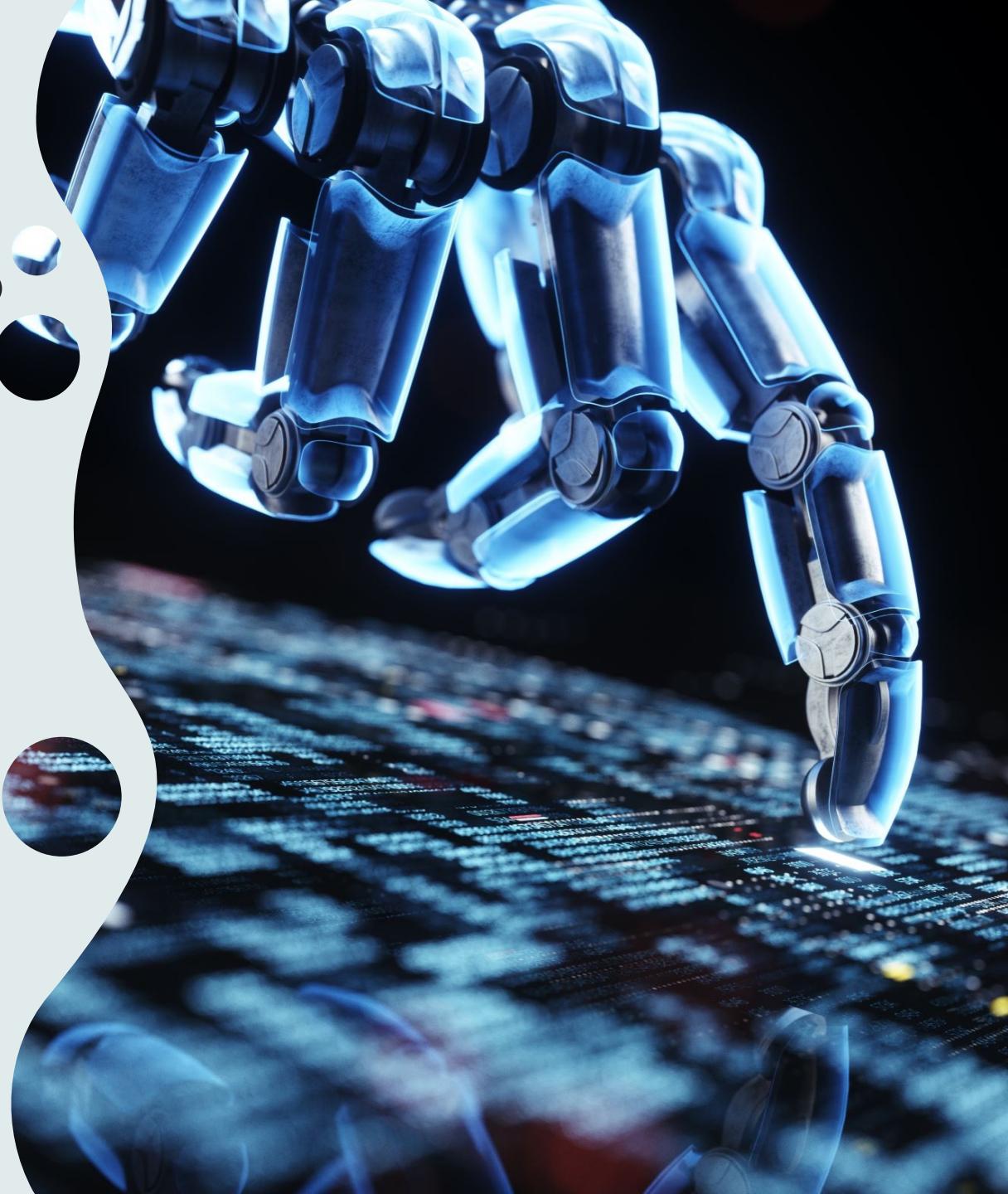
# What is Generative AI ?

- 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



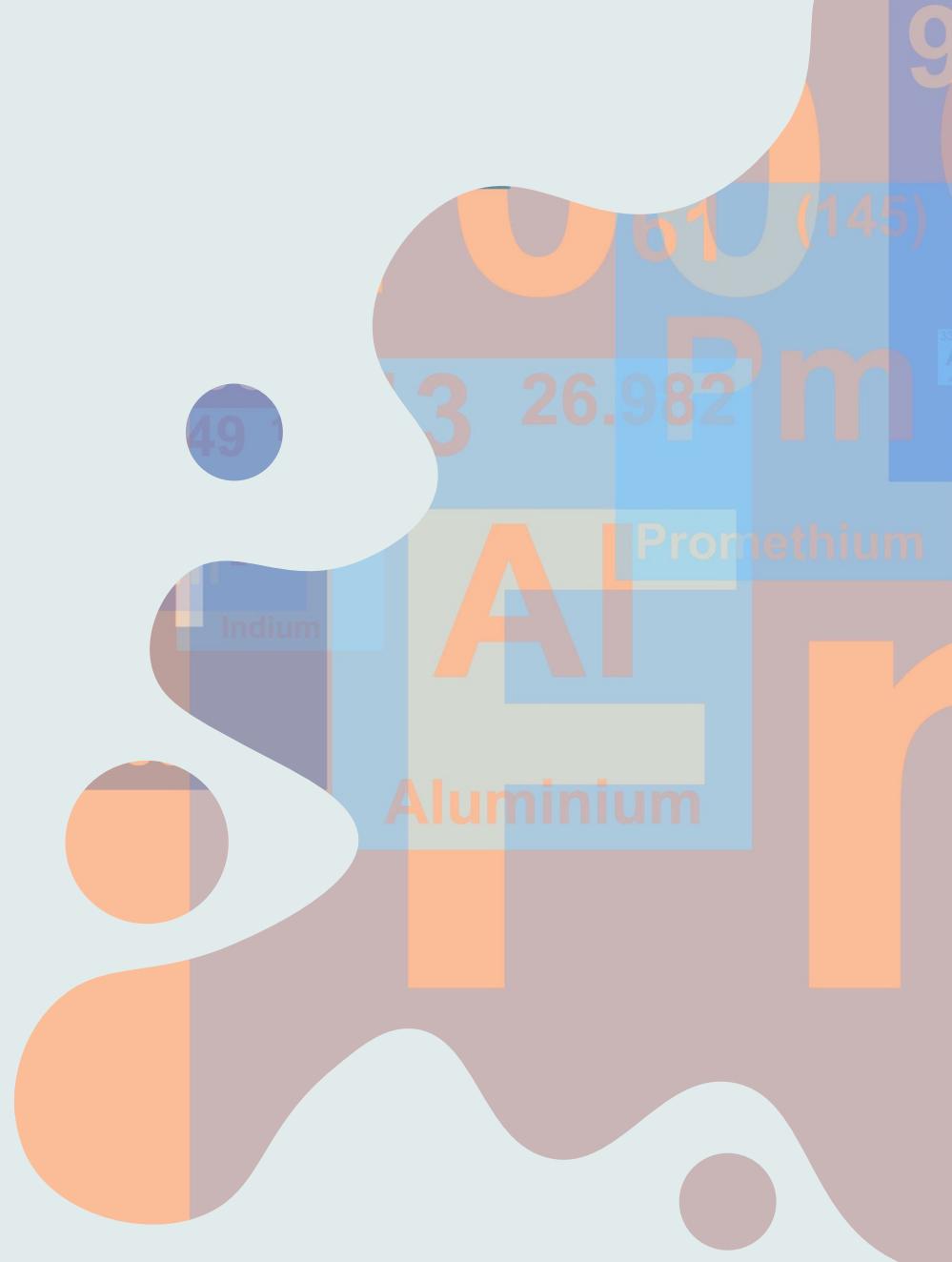
# What's All This Hype ?

- **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

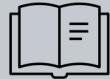


# GenAI Domains



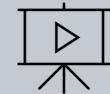
## Computer Vision

- **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

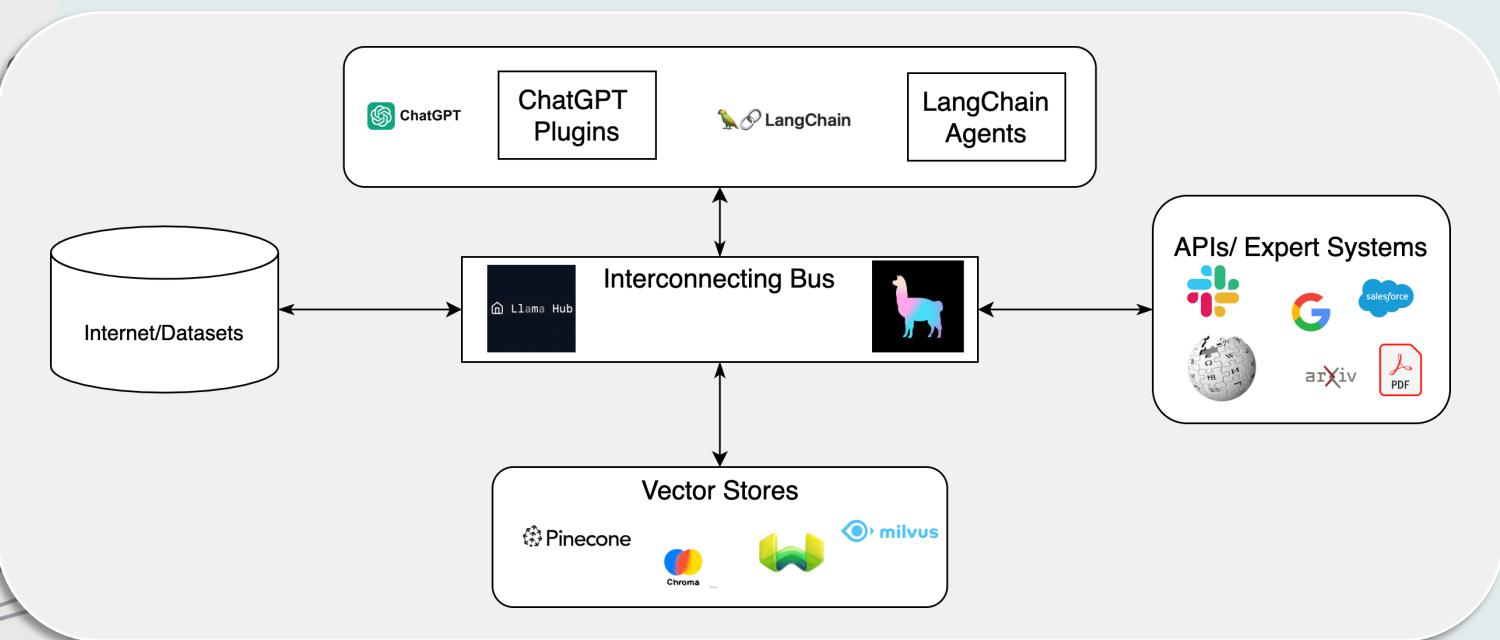


## Ethical Dilemma and Biases

# Agents of Change



# Agents of Change



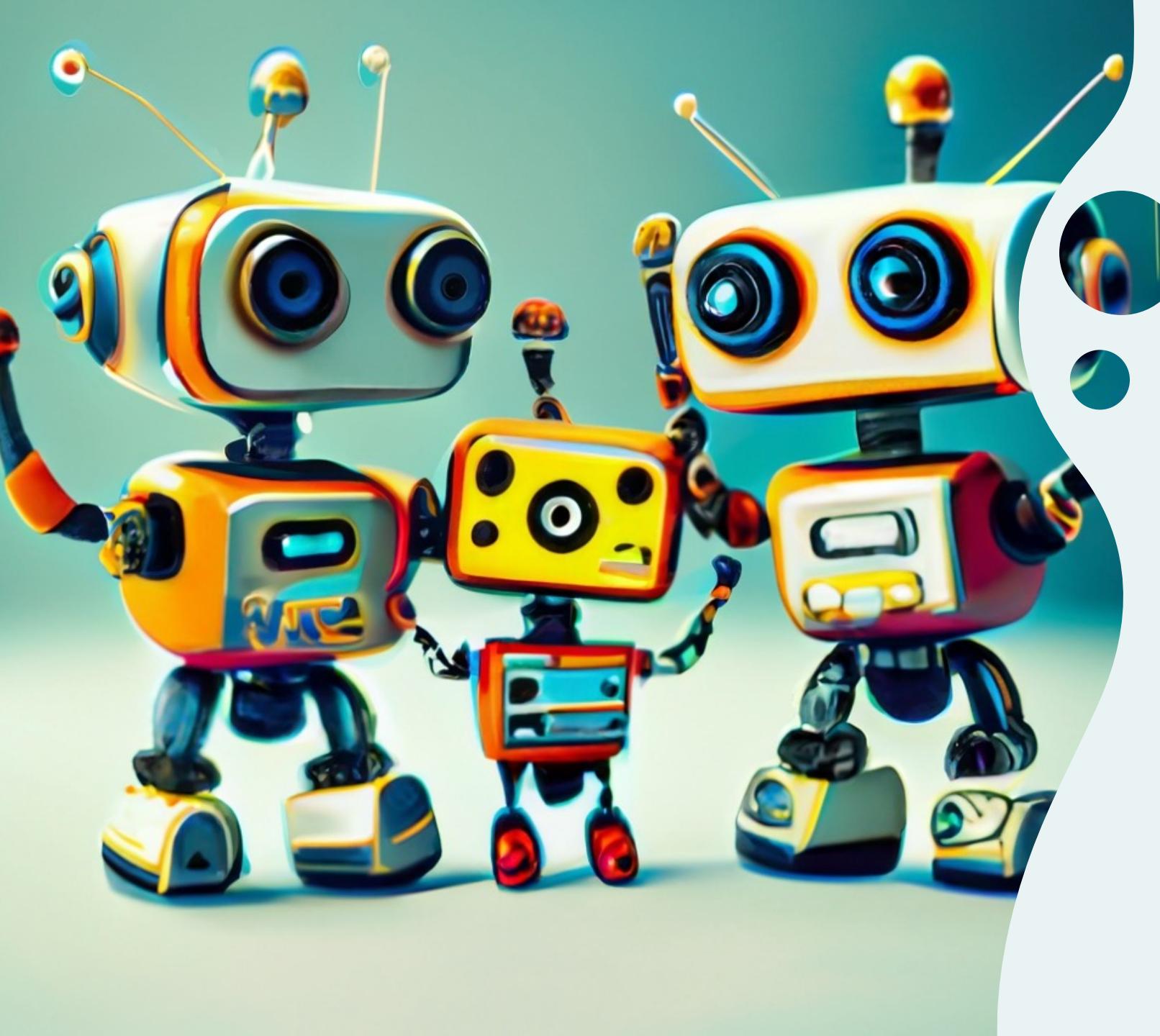
# Generative AI Powered APP

Demo Time



# Limitations/Challenges

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



# Thank You

Raghav Bali