Using Artificial Intelligence to Improve Air Monitoring

OR

Teaching Robots to Do My Job: Artificial Intelligence's Takeover of Air Monitoring

Brian Marquardt
Tehama County APCD

Overview

- What are Large Language Models?
- How AI can be utilized
- Risks and considerations
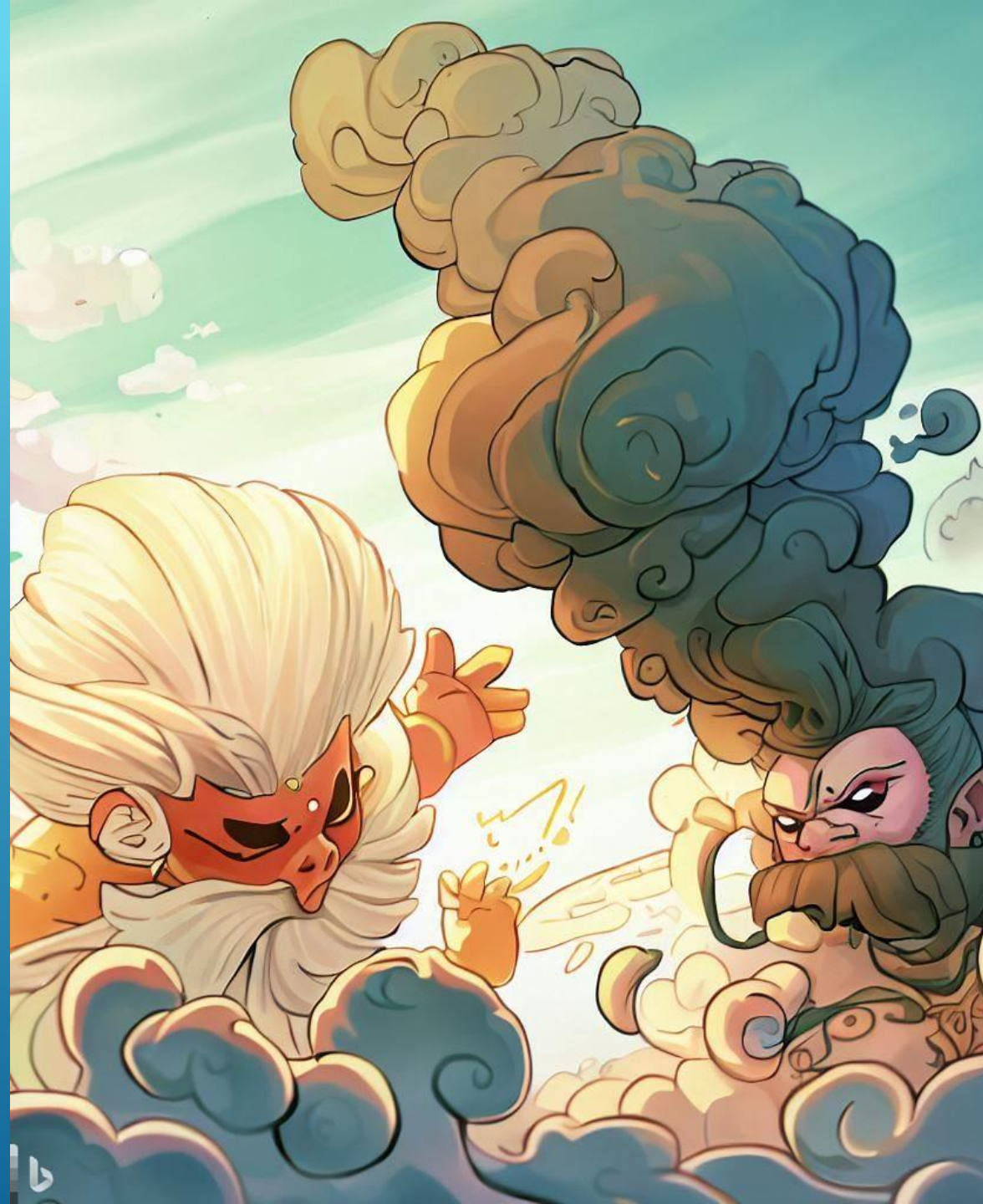- Security and Privacy
- Use Cases
- Conclusion
- Q&A

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Introduction

- AI comes in many shapes and forms
- Large Language Models (LLMs) produce human-like text
- Possible to use LLMs to assist us

What are Large Language Models?

▸ AI trained on massive amounts of data

▸ Look for patterns in text data

▸ Predict text in response to a prompt

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How can AI be utilized?

- ▶ Language generation
  - ▶ Answering questions
  - ▶ Translating text
  - ▶ Idea generation
  - ▶ Interaction with the public

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More AI Uses

- ▶ Question answering
- ▶ Public communications
- ▶ Data analysis

Considerations

- Biased datasets
  - Skewed responses
  - Can result in unfair decisions
- Misinformation
  - Generates responses based on probability
  - Answers can contain fake data, sources or citations
- Unjustified confidence

Privacy and Security
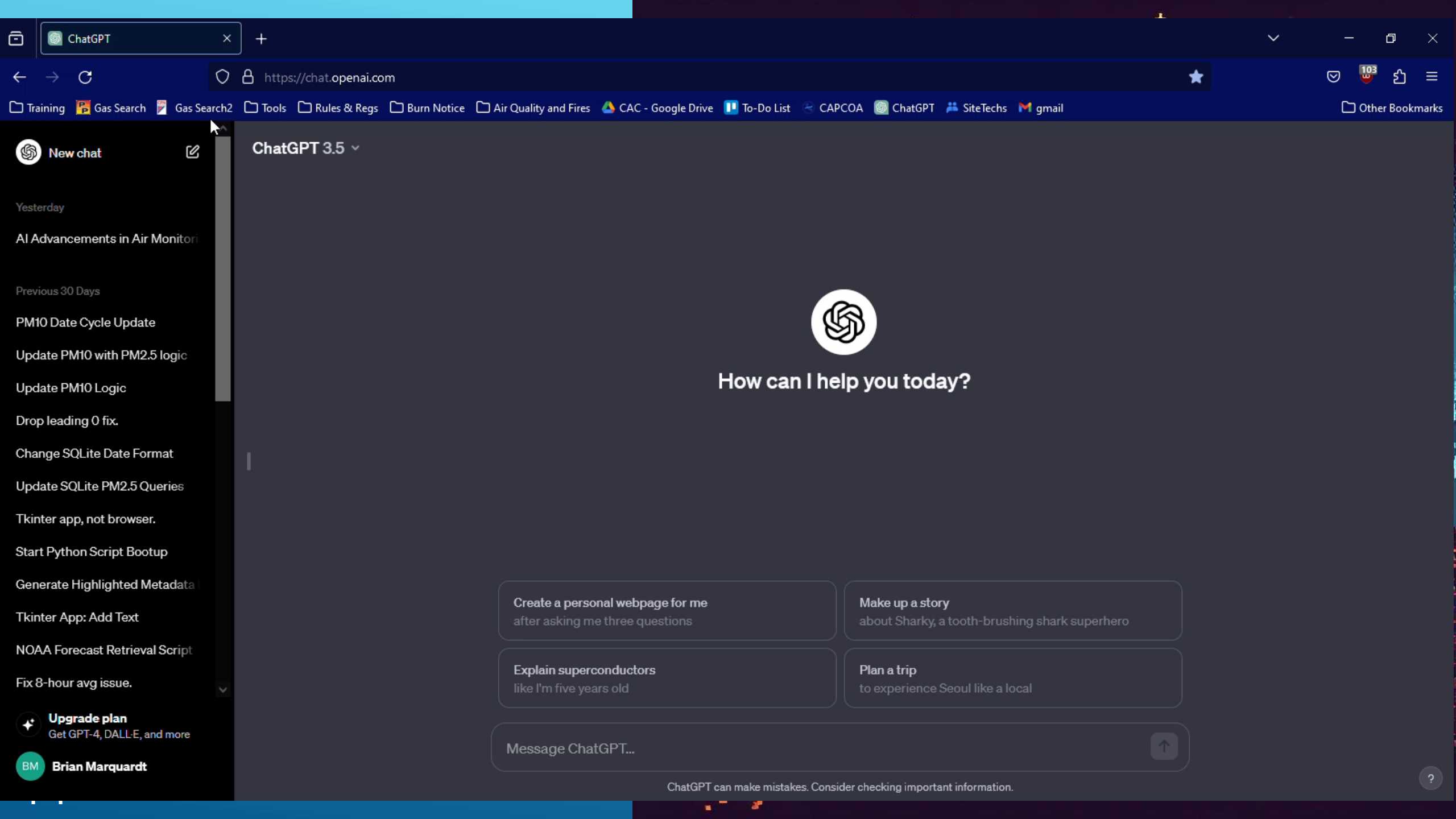
- Interactions are stored
- Data must be handled responsibly
- Agencies should adopt policies that guide our interactions

Use Cases

- **Portuguese Ministry of Justice**
  - ➢ Public-facing question and answer tool
- **Tehama County APCD**
  - ➢ Improved data management
  - ➢ Alarms
  - ➢ Toggles
  - ➢ Data QC
  - ➢ Incremental approach to script writing and confirmation of data

https://chat.openai.com

New chat

Yesterday

AI Advancements in Air Monitori

Previous 30 Days

PM10 Date Cycle Update

Update PM10 with PM2.5 logic

Update PM10 Logic

Drop leading 0 fix.

Change SQLite Date Format

Update SQLite PM2.5 Queries

Tkinter app, not browser.

Start Python Script Bootup

Generate Highlighted Metadata

Tkinter App: Add Text

NOAA Forecast Retrieval Script

Fix 8-hour avg issue.

Upgrade plan
Get GPT-4, DALL-E, and more

BM Brian Marquardt

ChatGPT 3.5 ⌄

How can I help you today?

Create a personal webpage for me
after asking me three questions

Make up a story
about Sharky, a tooth-brushing shark superhero

Explain superconductors
like I'm five years old

Plan a trip
to experience Seoul like a local

Message ChatGPT...

ChatGPT can make mistakes. Consider checking important information.

Conclusion Discussion

- LLMs are trained on vast amounts of language data

- Useful applications

  - Language generation

  - Data analysis

- Inherent risks in language data

- Privacy and Security considerations

Questions?

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