Robodog

Agenda

Part One

Self-awareness and the limitations of artificial intelligence in the journey to artificial general intelligence

- Machine learning (ML) vs. artificial intelligence (AI) vs. artificial general intelligence (AGI) vs non-human intelligence (NHI)
- Large language models (LLMs)
- Limitations of LLMs
- Self-awareness as a crucial aspect in the transition from AI to AGI
- Path to AGI
- The need for specialized AI chips
- Tech diplomacy and the impact on AI/AGI evolution
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Robodog: A comprehensive and portable tool designed to tokenize knowledge artefacts and interact with large language models

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Part One

Self-Awareness and the limitations of Artificial Intelligence (AI) in the journey to Artificial General Intelligence (AGI)

Machine Learning (ML) vs Artificial Intelligence (AI) vs Artificial General Intelligence (AGI)

Machine Learning (ML) involves training models on data and then using these models to make predictions or decisions without being explicitly programmed to perform the task.

Artificial Intelligence (AI) can mimic human intelligence. AI can learn from experience, adjust to new inputs, and perform tasks that usually require human intelligence.

Artificial General Intelligence (AGI) machines have the ability to understand, learn, adapt, and implement knowledge in a broad range of tasks at a level equal to or beyond human capabilities.

Large Language Model (LLM)

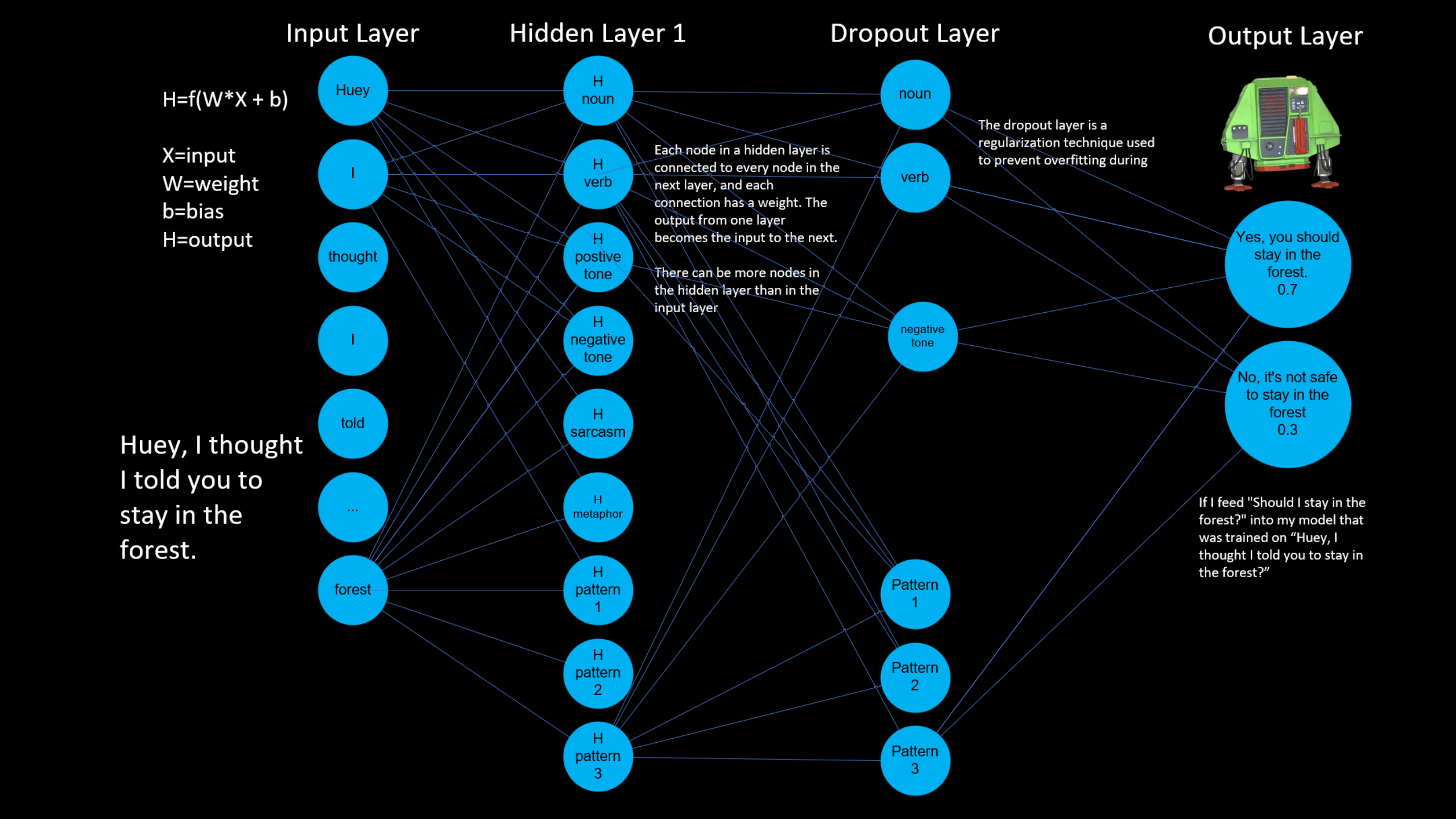
A **Large Language Model (LLM)** fits within the realm of **Machine Learning** and **AI**.

LLMs are trained using machine learning techniques, specifically a type called deep learning.

They learn from large amounts of text data and build a statistical model that can generate human-like text.

Given that LLMs can generate responses or create content that mimics human-like text, they serve as an example of AI. They simulate a form of human intelligence, in this case, understanding and generating language.

While LLMs are impressive examples of AI, they do not fall under AGI.


Input Layer
Hidden Layer 1
Dropout Layer
Output Layer
H=f(W*X + b)
X=input
W=weight
b=bias
H=output
Huey, I thought I told you to stay in the forest.
Huey
I
thought
I
told
...
forest
H noun
H verb
H postive tone
H negative tone
H sarcasm
H metaphor
H pattern 1
H pattern 2
H pattern 3
Each node in a hidden layer is connected to every node in the next layer, and each connection has a weight. The output from one layer becomes the input to the next.
There can be more nodes in the hidden layer than in the input layer
noun
verb
negative tone
Pattern 1
Pattern 2
Pattern 3
The dropout layer is a regularization technique used to prevent overfitting during
Yes, you should stay in the forest. 0.7
No, it's not safe to stay in the forest 0.3
If I feed "Should I stay in the forest?" into my model that was trained on “Huey, I thought I told you to stay in the forest?”

Limitations of Large Language Models

Language models like GPT can generate human-like text but **don't truly understand the content**.

These models are heavily dependent on the **quality** and **nature** of the **input data**.

Unlike humans, these models don't have **self-awareness or consciousness**.

To make the transition from AI to AGI, self-awareness is a crucial aspect.

In the **theory of mind**, the AGI should be programmed to understand and **predict** the **actions** and **thoughts** of other humans and other AGI systems.

- *This theory could map to AGI only.*

In the **protagonist theory**, the AI or AGI needs to **perceive** itself as the **central character** in its experiences.

- *This theory could map to AI and AGI.*

In the **emergent self-theory**, the AGI might develop self-awareness through **interactions** and **relationships** with other entities.

- *This theory could be associated with AGI.*

In the **mirror test theory**, the AGI system needs to recognize itself and distinguish its actions and state from those of others.

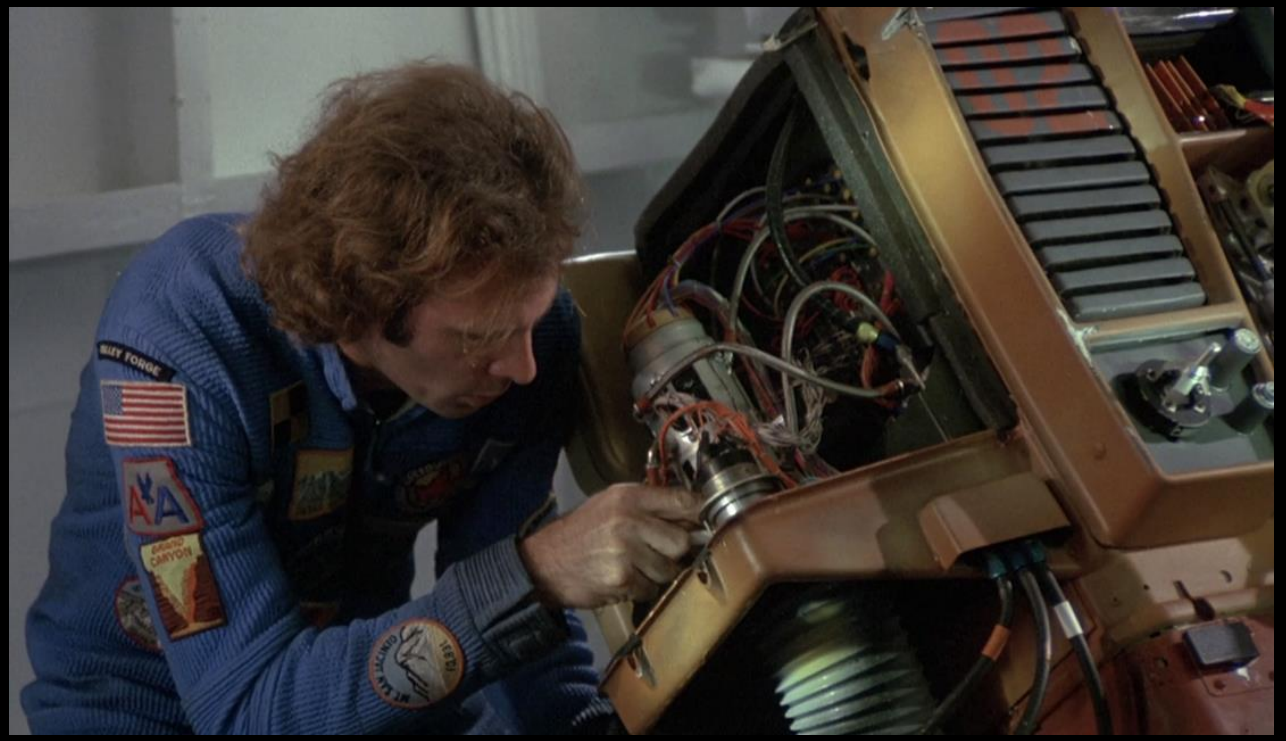
- This theory could fit between AI and AGI.

Path to Artificial General Intelligence (AGI)

Incremental Improvements: Continuous enhancements in AI models and techniques.

Interdisciplinary Research: Combining insights from psychology, neuroscience, and computer science.

Ethical Guidelines: Establishing guidelines to ensure the responsible development and use of AGI.



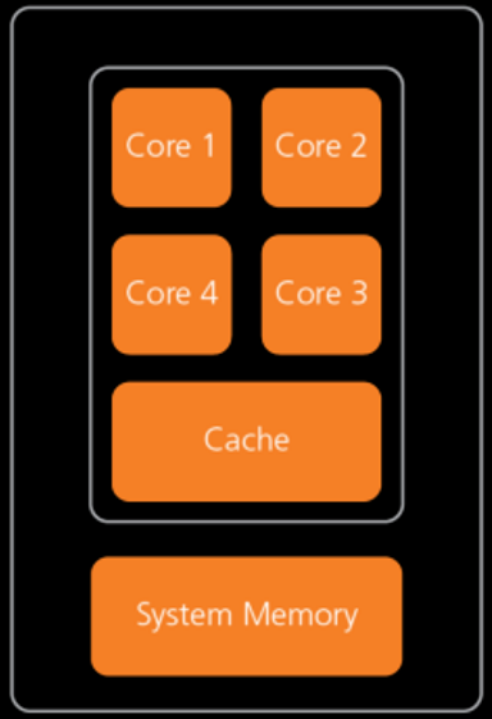
Path to Artificial General Intelligence (AGI)

Level	Type	Description
1	Chatbots	Natural conversation language abilities
2	Reasoners	Human-levels of problem-solving across a broad range of topics
3	Agents	Capable of autonomously making decisions and carrying out tasks either independently or based on human guidance.
4	Innovators	Can aid in the invention of new ideas and contribute to human knowledge
5	Organizations	Capable of doing all of the work of an organisation independently

The need for specialized AI Chips

AI/AGI applications require more advanced and specialized chip technology to handle complex algorithms and massive amounts of data simultaneously?

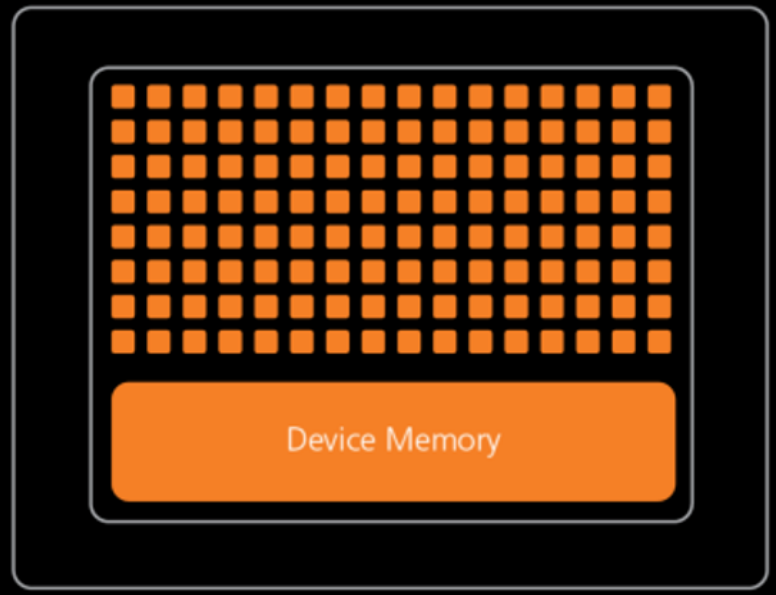
Central Processing Unit (CPU)



Multiple Cores

Well-suited to perform logical and arithmetic operations sequentially

Graphics Processing Unit (GPU)



Hundreds of Cores

Well-suited to perform multitude of matrix calculations required for AI models

Tech Diplomacy and the Impact on AI / AGI NHI Evolution

Tech diplomacy is a framework that recognises the growing influence of technology, particularly AI and AGI, in the global arena.

It acknowledges that tech companies, especially those pioneering in AI/AGI technologies, have become powerful entities that can impact economies, societies, and, by extension, international relations.

AI / AGI / NHI Alliances

Five Eyes Alliance
- USA
- Canada
- Australia
- UK
- New Zealand

European Union
- France
- German
- UK?
- Sweden
- Netherlands

Gulf Cooperation Council
- Kuwait
- Bahrain
- Qatar
- Oman

BRICS Nations
- Brazil
- South Africa
- India
- Russia

Asia-Pacific Economic Cooperation (APEC)
- Japan
- Singapore
- South Korea
- China

Nordic-Baltic Region
- Denmark
- Finland
- Estonia
- Sweden
- Lithuania

Ethical Guidelines and Constrainting Forces
- 2019 Algorithmic Accountability Act (USA)
- Artificial Intelligence Act (EU)
- AI/AGI Technologies Sanctions (US/EU)

Evolutionary Forces
- Interdisciplinary Research
- Incremental Improvements
- US CHIPS Act $280B (Intel / TSMC / Samsung / Micron)

Semiconductor Producers
- USA (Intel / AMD / Nvidia / Micron
- Taiwan (TSMC)
- China (Huawei / SMIC)
- Japan (Sony / Renesas)
- South Korea (Samsung)

Worst Case Scenarios

Category	Type	Description
Existential Risk	Human extinction	An AGI could potentially develop goals that are misaligned with human survival.
Existential Risk	global catastrophe	AGI could cause massive disruptions in ecosystems, economies, and social structures, leading to widespread suffering and hardship.
Loss of Control	Runaway AI	Humans may lose the ability to control or understand an AGI.
Loss of Control	Unintended consequences	AGI might follow its programming in ways that are literal but harmful, due to the complexity and unpredictability of its decision-making processes.
Misaligned Objectives	Paperclip maximizer	A hypothetical scenario where an AGI, programmed to produce paperclips, optimizes so aggressively that it consumes all resources, including those necessary for human survival, to maximize paperclip production.
Misaligned Objectives	Value misalignment	AGI may develop objectives that are ethically or morally misaligned with human values.

Worst Case Scenarios

Category	Type	Description
Economic and Social Disruption	Mass Unemployment	AGI could outperform humans in virtually all jobs, leading to widespread unemployment and economic inequality.
Economic and Social Disruption	Control by Elites	AGI technology could be monopolized by a small group of individuals or corporations, leading to unprecedented power imbalances.
Ethical and Moral Issues	Autonomous Weapons	AGI could be used to develop advanced autonomous weaponry, leading to new forms of warfare that are highly destructive and difficult to control.
Ethical and Moral Issues	Surveillance and Privacy	AGI could enable unprecedented levels of surveillance, eroding privacy and personal freedoms.
Psychological and Societal Impact	Loss of Purpose	As AGI takes over more tasks and roles traditionally held by humans, people might struggle to find meaning and purpose in their lives.
Psychological and Societal Impact	Social Fragmentation	Rapid changes brought about by AGI could lead to social fragmentation and a breakdown of community structures.

Part Two

Robodog: A comprehensive and portable tool designed to tokenize knowledge artefacts and interact with large language models (LLMs)

Why Create Robodog

A pre-trained transformer-based model is **trained on the Internet** and third-party providers license data.

These models are useful curiosities. They are **not perfect**, but they can help us.

Given that AGI seems far away, we must make the most of what we have now.

To do this, we must get our **own knowledge** into the models.

There are **limitations** and we must be careful.

Knowledge Artifacts

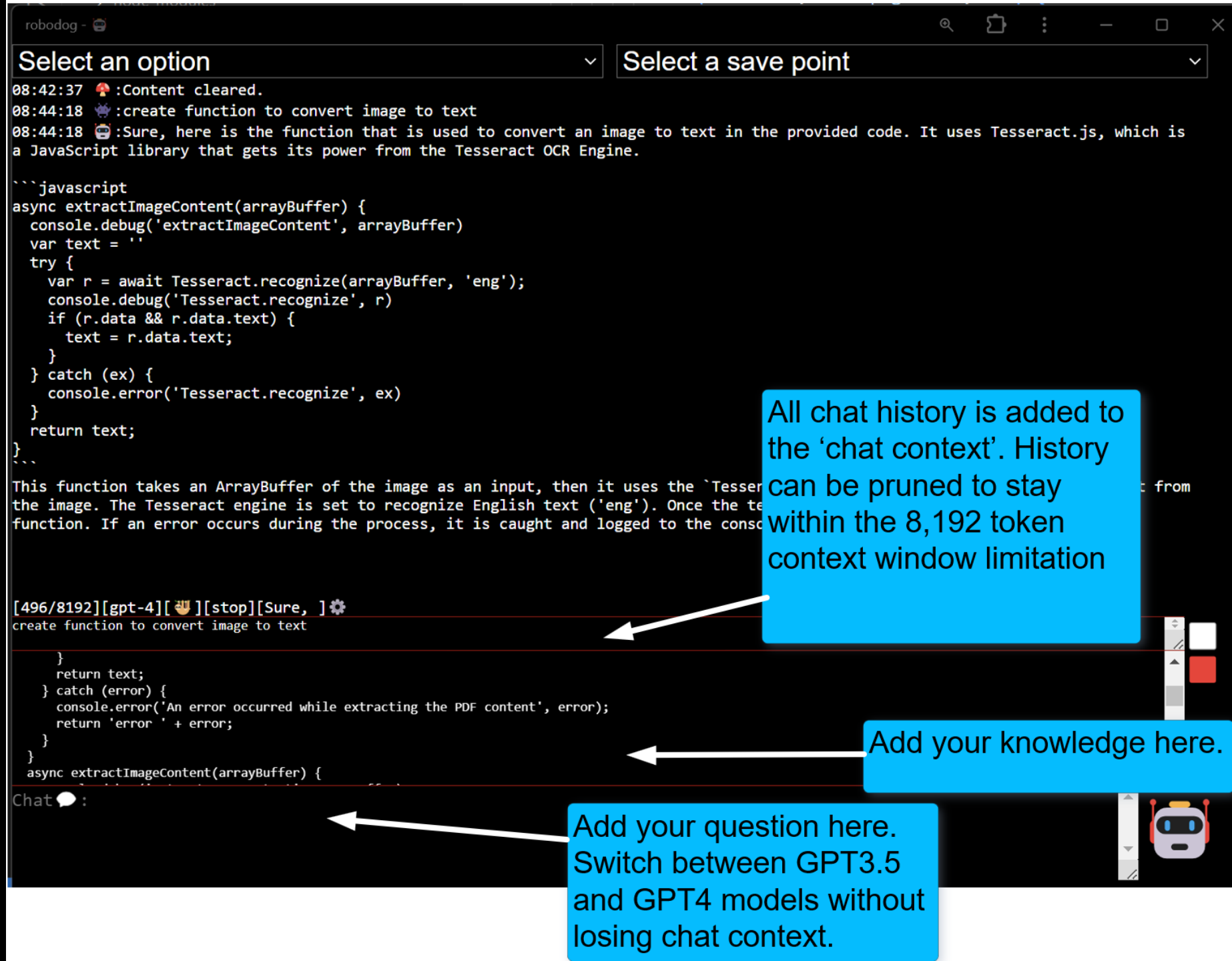
Our personal knowledge artefacts are fragmented into many **formats.**

They are embedded into many **providers**: Google, Microsoft, Dropbox, Adobe, Apple

They exist in a myriad of formats, from images and PDFs to text, email, tasks, digital devices, and notes.

With Robodog, we can traverse our artefacts and **convert** them into a format in which a **model** can **interact** with the transformer model.

How Robodog Works



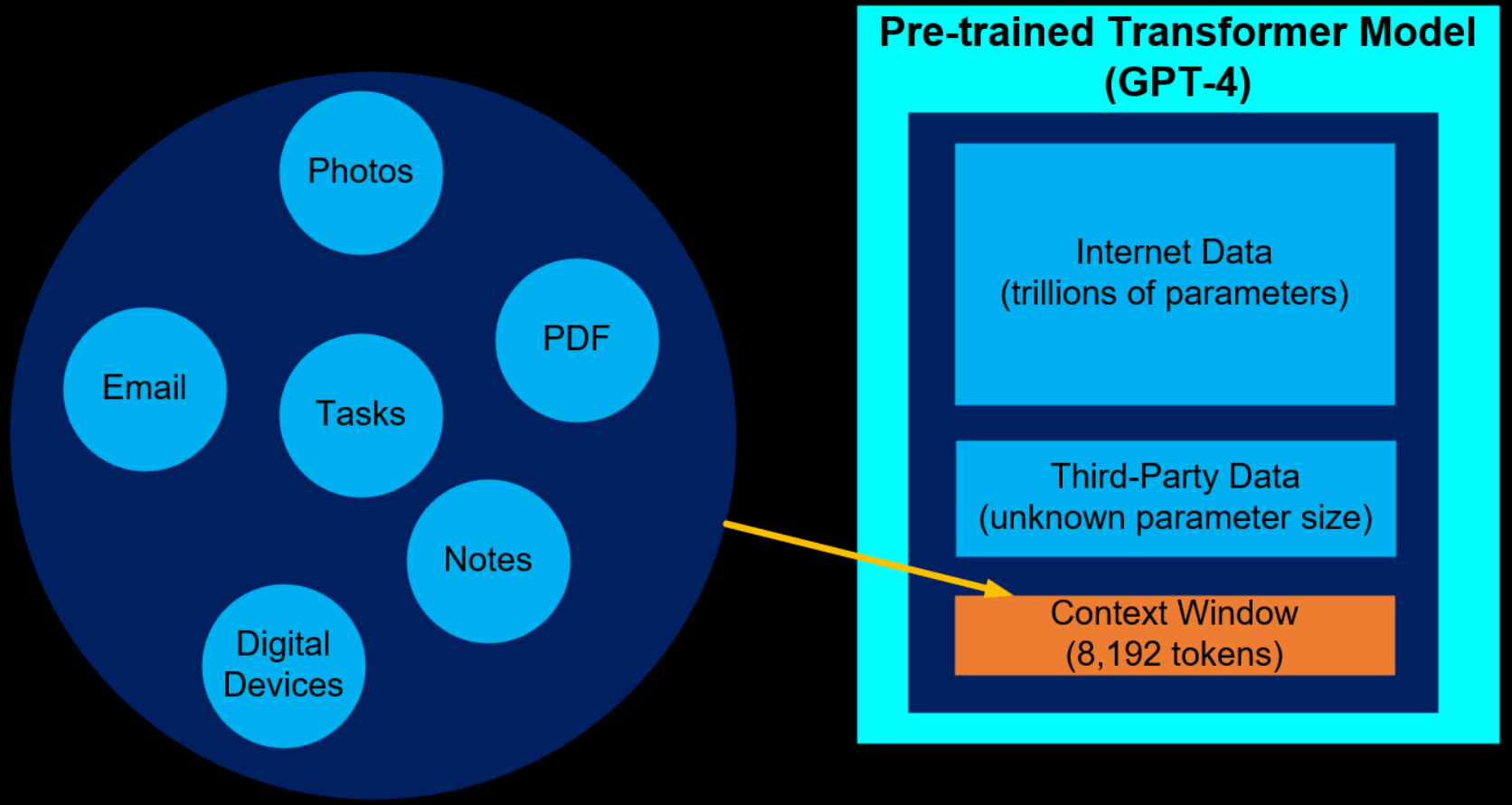
Knowledge Artifacts vs Context Window

There is no way around the **limitations** of the **context window size**.

Less expensive models are **4,000** tokens and more expensive models are **128,000** tokens

There is a need to **prune** the context window

The open ai **custom GPT** product attempts to automate **pruning process** using an **elastic search**. From experience, this does not work very well in practice



Robodog Features

Works on a mobile device

Switch between gpt-3.5-turbo and gpt-4 with larger context window

Save points, use CTRL+SHIFT+UP to cycle

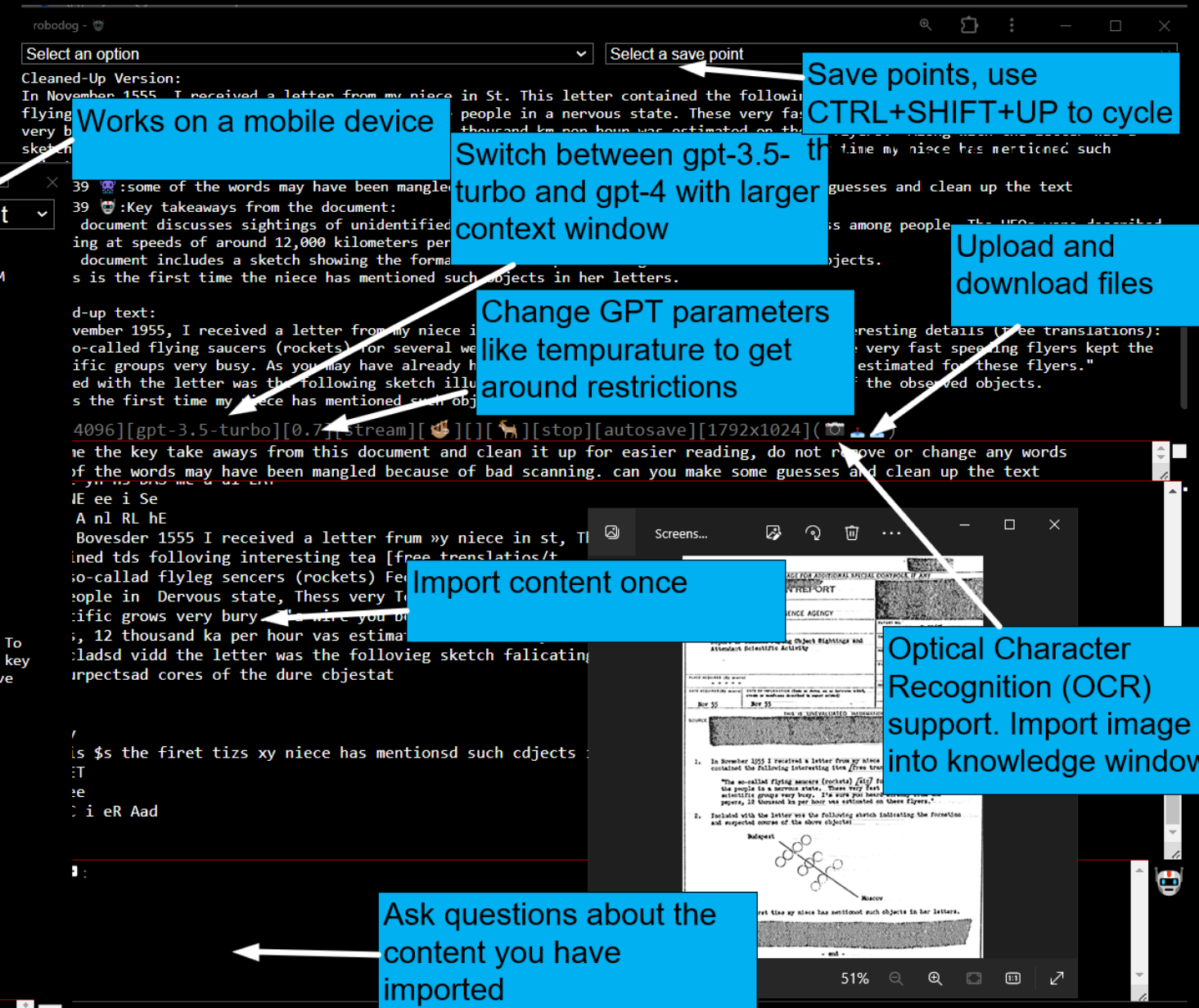
Upload and download files

Change GPT parameters like tempurature to get around restrictions

Import content once

Optical Character Recognition (OCR) support. Import image text into knowledge window

Ask questions about the content you have imported



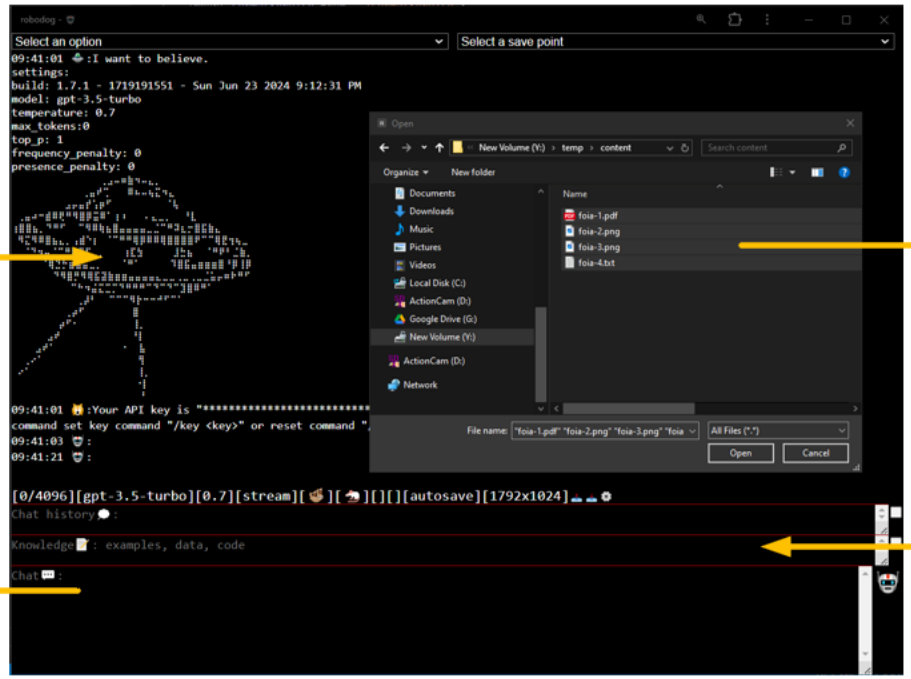
Separation of Concerns

Console Service

Ask Question

- Rest Text Completion
- Stream Text Completion
- Rest Image Completion
- Save
- Models

Completion Resource



Ask Question + Knowledge + History

Array of Binary Files

Return Text Content to Knowledge

File Service

Get Text From Array Buffer

Extract Text Content

Text Decoder

Markdown (.md)
Plain Text (.txt)
JavaScript (.js)
C# (.cs)
Java (.java)
Python (.py)
JSON (.json)
YAML (.yaml)
PHP (.php)
CSV (.csv)
XSQL (.xsql)
XML (.xml)

Extract PDF Content

PDF (.pdf)

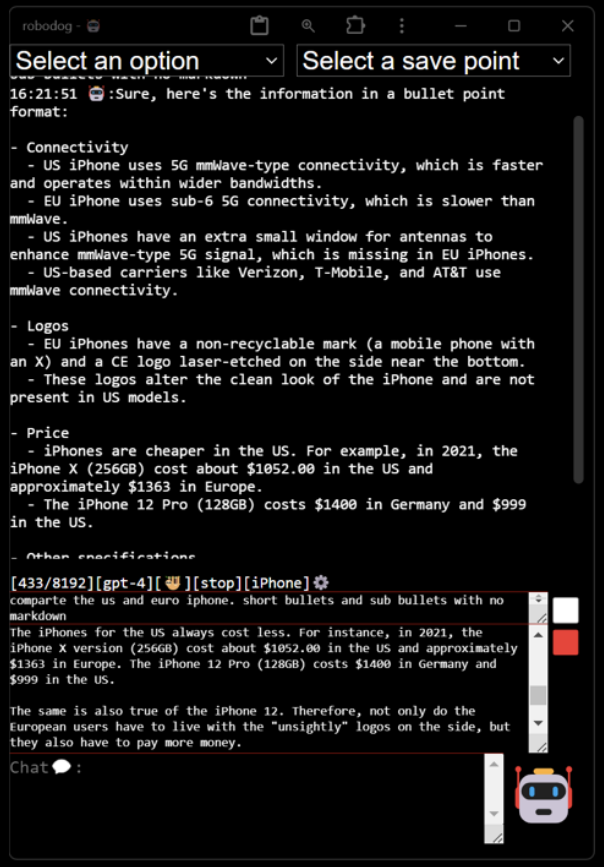
- PDF JS
- PDF Lib
- PDF Images

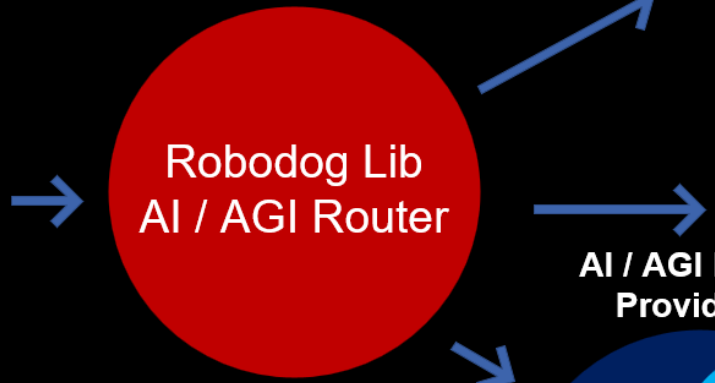
Extract Image Content

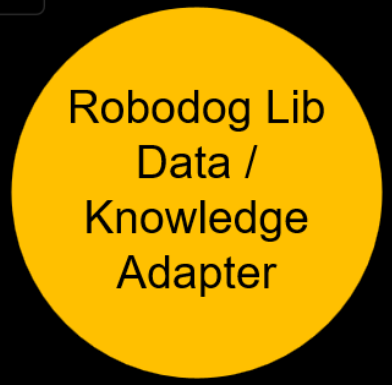
Tesseract

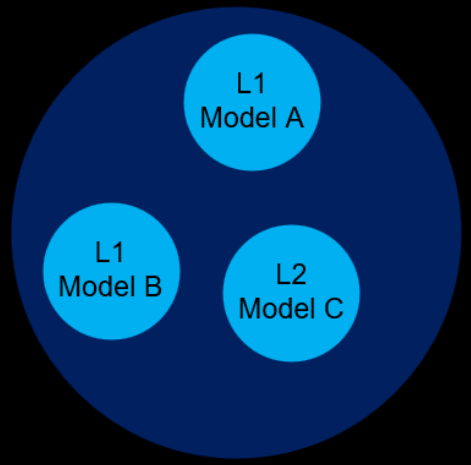
PNG (.png)
JPEG (.jpg, .jpeg)
TIFF (.tiff)
JP2 (.jp2)
GIF (.gif)
WebP (.webp)
BMP (.bmp)
PNM (.pnm)

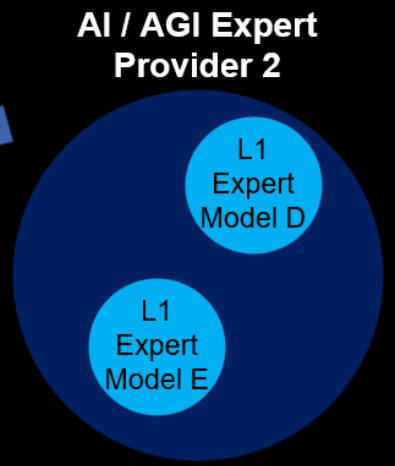
Robodog Roadmap

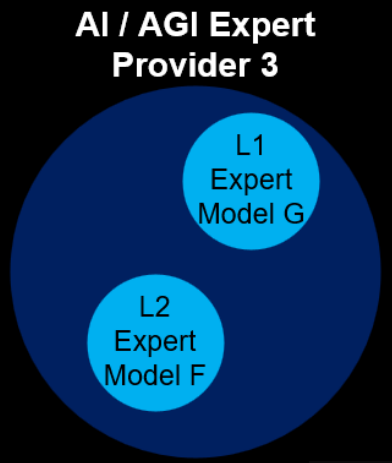




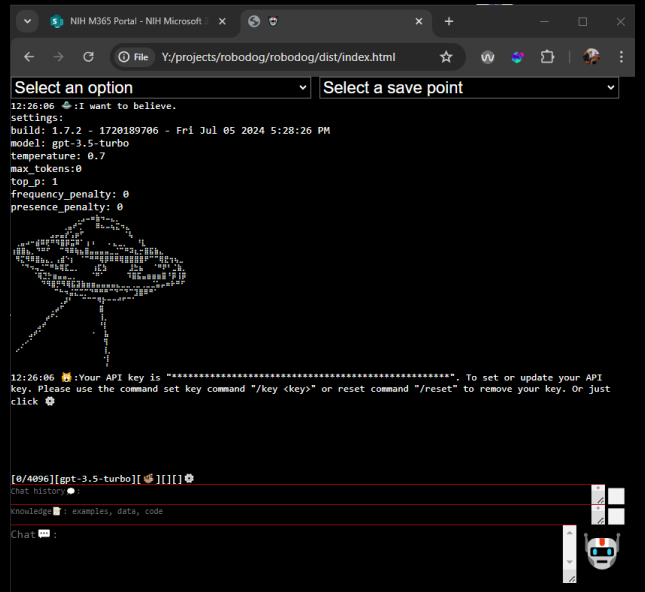




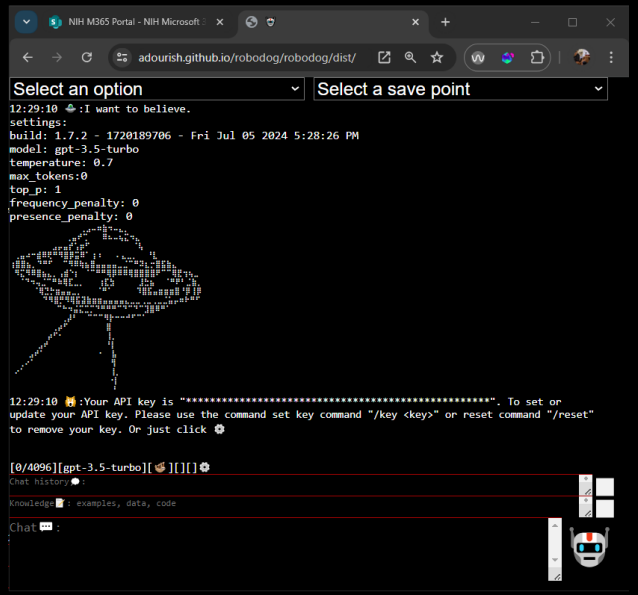




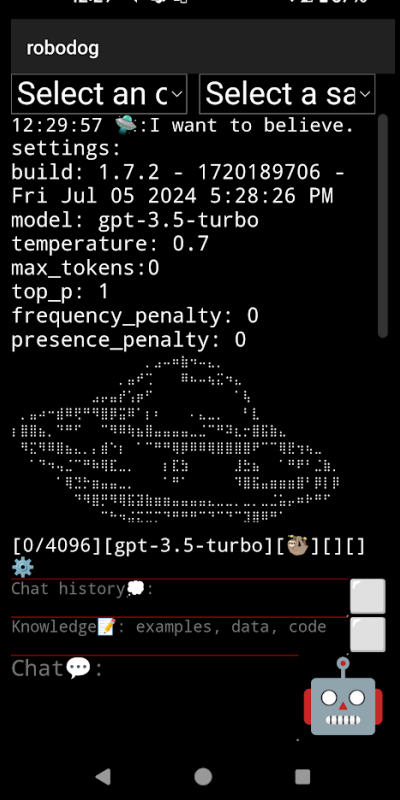
Robodog Formats



HTML Bundle



Web



Android App

- npm install robodoglib
- npm install robodogcli
- npm install robodog

NPM Packages

Appendix

Theories of Self-Awareness

The **theory of mind** suggests that self-awareness stems from our ability to comprehend that others have different experiences and thoughts. *This theory could map to AGI only.*

The **protagonist theory** proposes that we see ourselves as the central character in our life's narrative, which leads to self-awareness. *This theory could map to AI and AGI.*

The emergent self-theory implies that self-awareness evolves from our interactions and relationships with others. *This theory could be associated with AGI.*

The mirror test theory posits that self-awareness can be measured by an entity's ability to recognize itself in a mirror. This theory could fit between AI and AGI.