

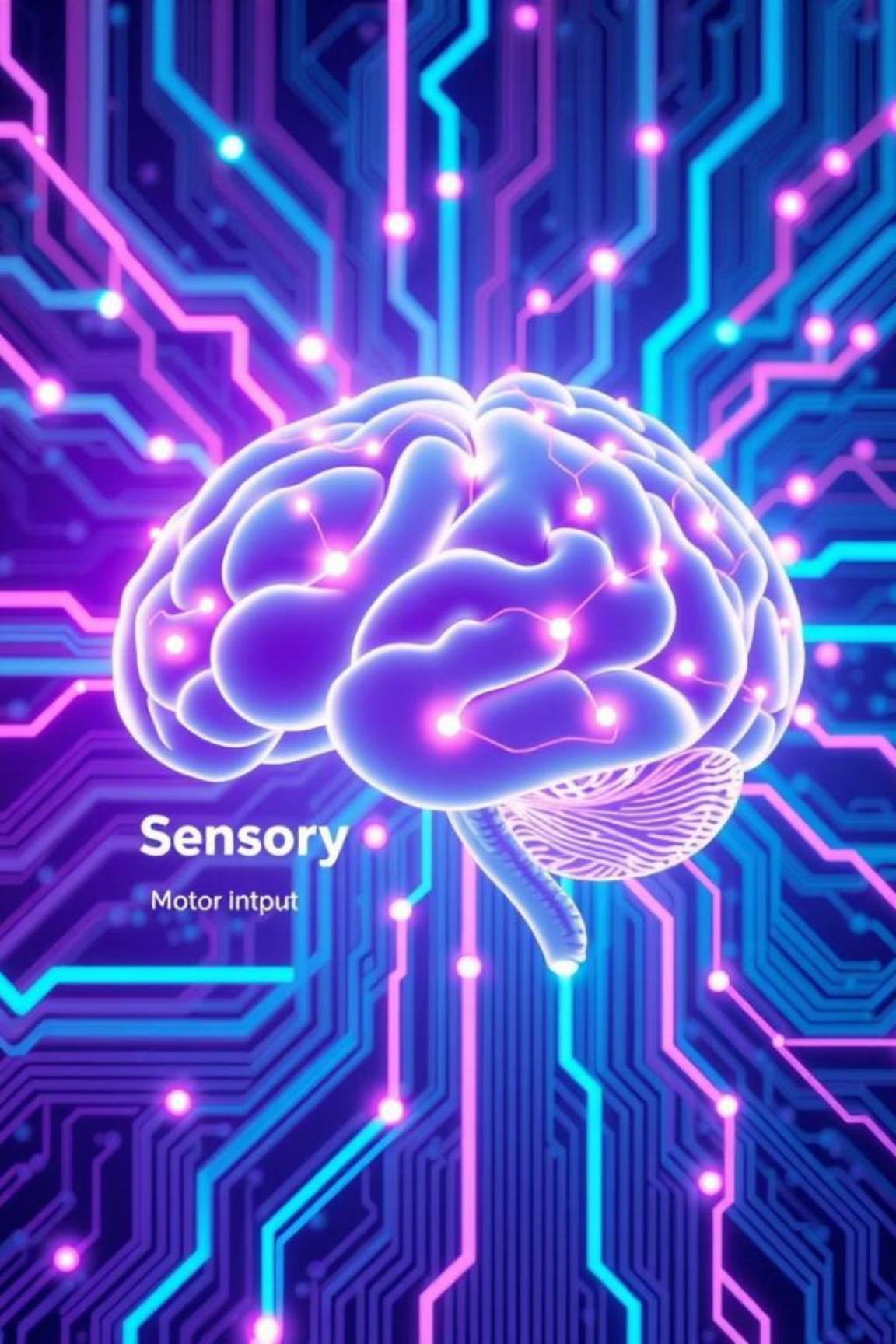


# Large Language Models (LLMs)

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# Understanding Large Language Models (LLMs)

Large Language Models (LLMs) generate human-like text by training on vast datasets. Examples include GPT-4, Bard, and LLaMA. They are revolutionizing industries with their versatile capabilities.





# What Are Large Language Models ?

## Definition

Deep learning models with billions of parameters enable language understanding.

## Scale

Examples: GPT-3 (175B), PaLM (540B), GPT-4 (over 1 trillion).

## Training Data

Trained on internet text, books, code, and diverse data sources.

## Foundation Models

Adaptable for many different language tasks across industries.





# How LLMs Work: Training Phase

1

## Self-Supervised Learning

The model predicts the next word in sequences without explicit labels.

2

## Loss Function

Measures prediction errors to guide model improvement.

3

## Backpropagation

Adjusts billions of parameters to minimize prediction errors.

4

## Compute Power

Needs thousands of GPUs or TPUs over weeks or months of training.



# How LLMs Work: Inference Phase

## Prompt Engineering

Creating precise input queries to guide model responses effectively.

## Tokenization

Breaking text into smaller pieces processed by the model.

## Attention Mechanism

Focuses on relevant input parts for context-aware generation.

## Decoding

Generates text based on learned probabilities and context clues.



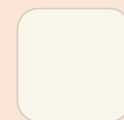


# Use Case: Content Generation



## Marketing Content

LLMs create blogs, ads, and social media updates fast.



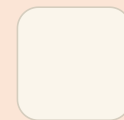
## Jasper.ai

Generates marketing copy, valued at 1.5B.



## Copy.ai

Automates writing with 13.9M funding.



## Efficiency

Produces ten times more content than humans.



# Use Case: Customer Service

## Automation

LLMs power chatbots and virtual assistants for fast support.

## Intercom

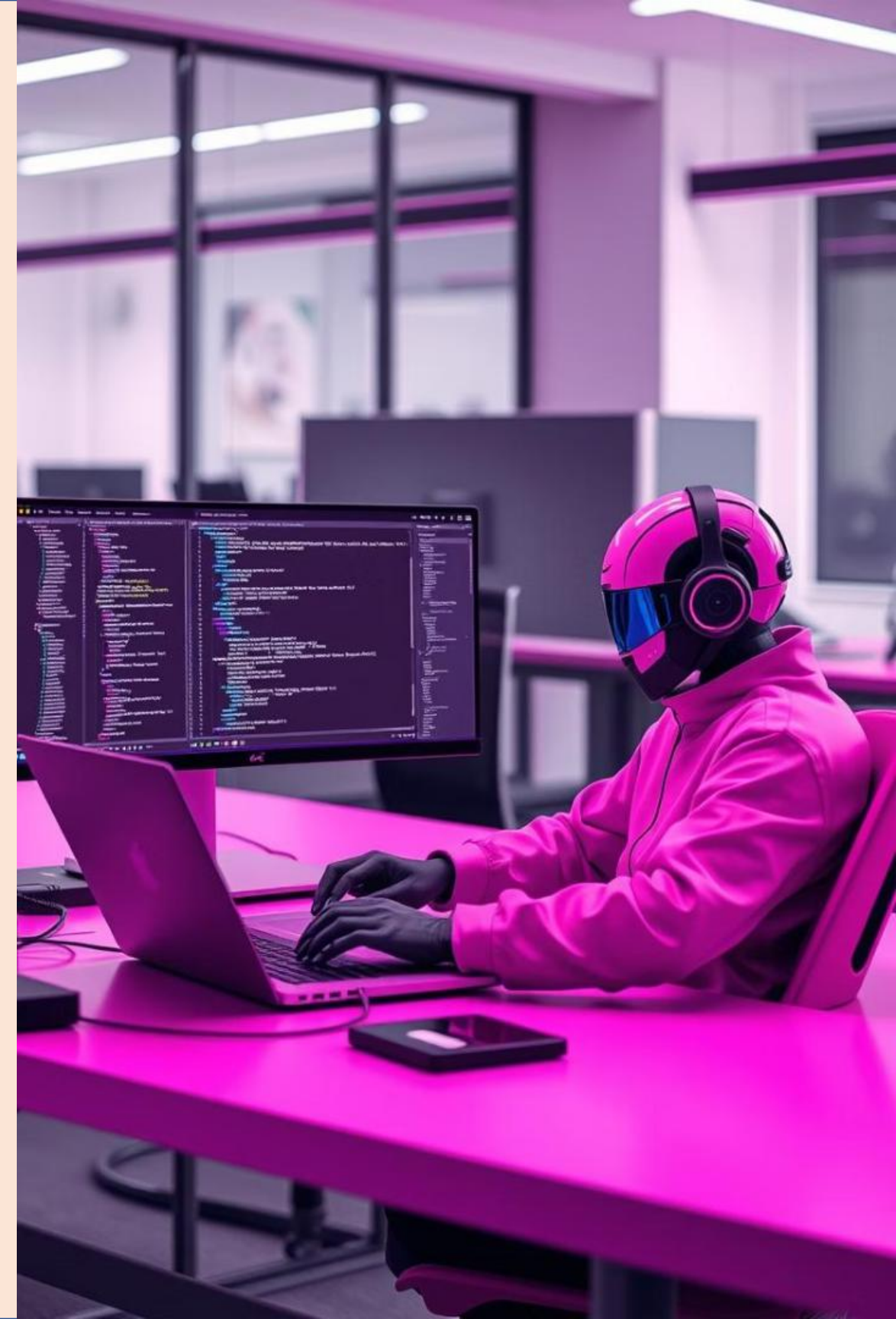
Uses AI to automate client interaction, valued at 1.6B.

## Ada Support

AI-driven service automation with 130M funding.

## Cost Reduction

Can cut support costs by up to 70%.



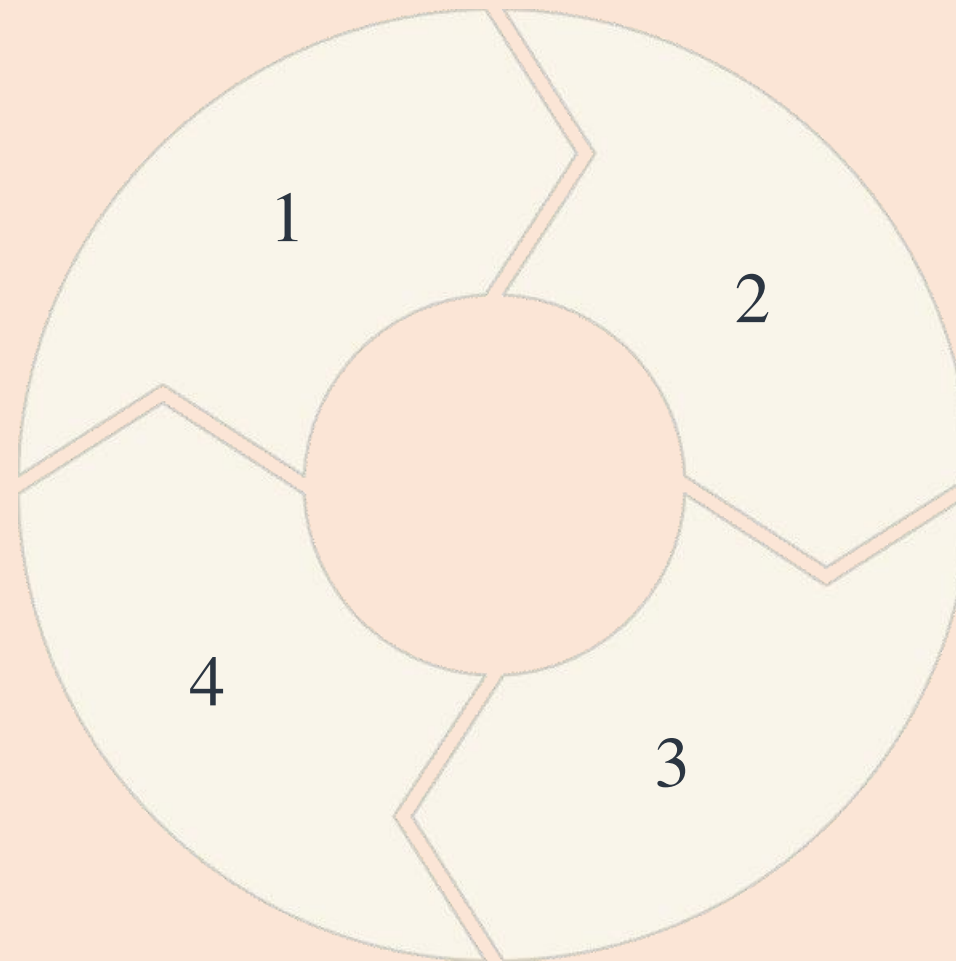
# Use Case: Code Generation

## Writing Assistance

LLMs help draft and autocomplete code efficiently.

## Time Savings

Reduces coding time by up to 40%.



## GitHub Copilot

AI pair programmer powered by OpenAI Codex.

## Tabnine

Popular AI code completion tool with 1 million users.



# Conclusion: The Future of LLMs

1

## Advancements

Models will grow larger, faster, and more efficient.

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2

## Integration

Embedded in diverse industries and daily apps.

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3

## Ethics

Focus on responsible AI development and fairness.

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4

## Impact

Changing how humans interact with technology forever.