



Exploring Possibilities for Generative AI

IBHE FAC Presentation

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What's This?



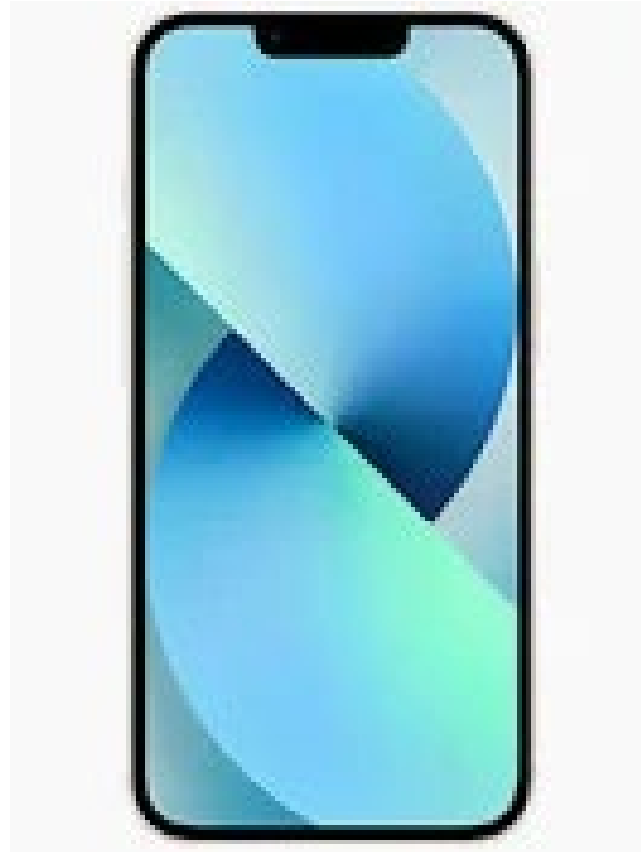


What's This?





What's This?





HARVARD BUSINESS REVIEW PRESS

Prediction Machines



The Simple Economics of
Artificial Intelligence

AJAY
AGRAWAL

JOSHUA
GANS

AVI
GOLDFARB



- The current wave of advances in artificial intelligence doesn't actually bring us intelligence but instead a critical component of intelligence: prediction.
- Prediction is the process of filling in missing information. Prediction takes information you have, often called "data," and uses it to generate information you don't have.



- Machines and humans have distinct strengths and weaknesses in the context of prediction. As prediction machines improve, businesses must adjust their division of labor between humans and machines in response.
 - Prediction machines are better than humans at factoring in complex interactions among different indicators, especially in settings with rich data. Prediction machines scale.
 - Humans are often better than machines when understanding the data generation process confers a prediction advantage, especially in situations with thin data. Human prediction does not scale in the same way as machine prediction.

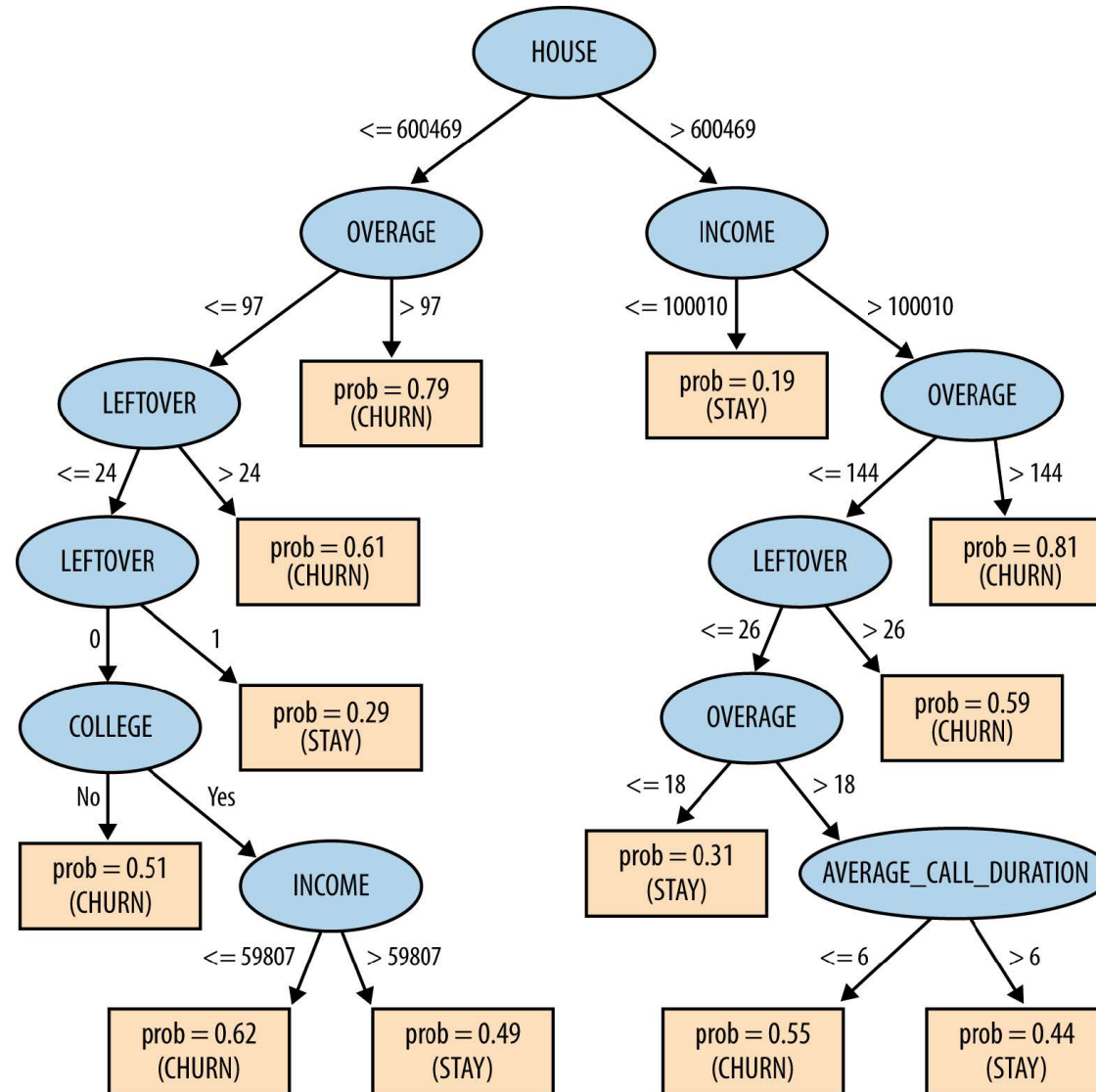


How Models are Built

- **Training Data:** Data with known values of the target that are used to train the model – i.e., to set its parameters
- **Test or Holdout Data:** Additional data with known values of the target that are used to measure the extent to which a proposed model will generalize to unseen data
- **Production Data:** Data to which the model will be applied in practice and for which the values of the target are unknown
- **The Fundamental Conflict:** Predictive capacity vs. ability to generalize
 - **Model complexity** allows a model to better capture the complexity in real production data
 - **Model complexity** causes a model to overfit – perform well on training data but fail to generalize that good performance to unseen production data
 - Model complexity: number of features, number of parameters, amount of training data
 - All models overfit – your job is to systematically manage overfitting with an eye on your overall goal of an effective prediction



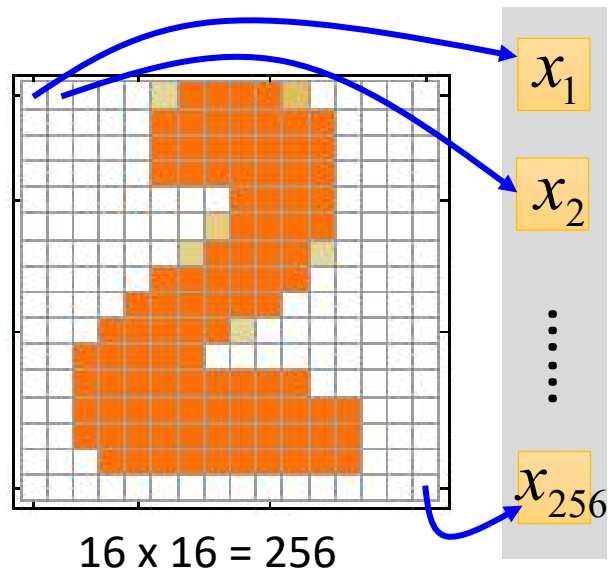
Decision Tree with Class Probability Estimates





Handwriting Digit Recognition

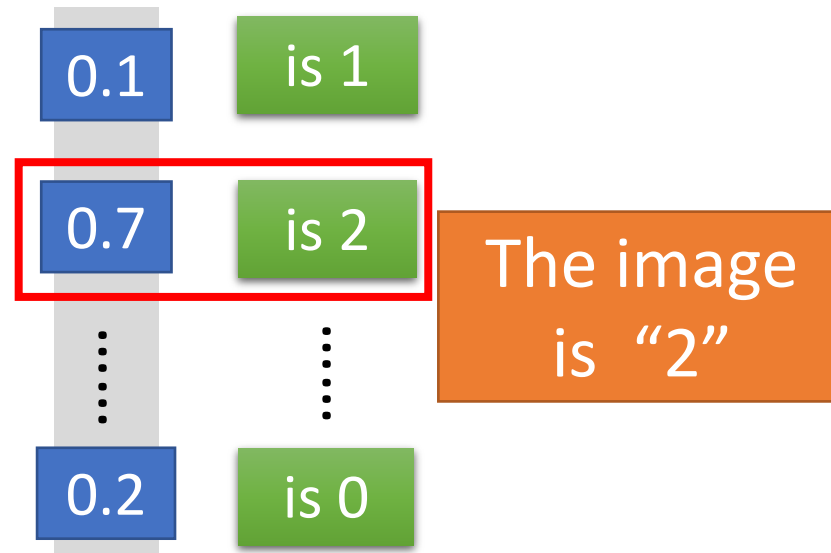
Input



Ink \rightarrow 1

No ink \rightarrow 0

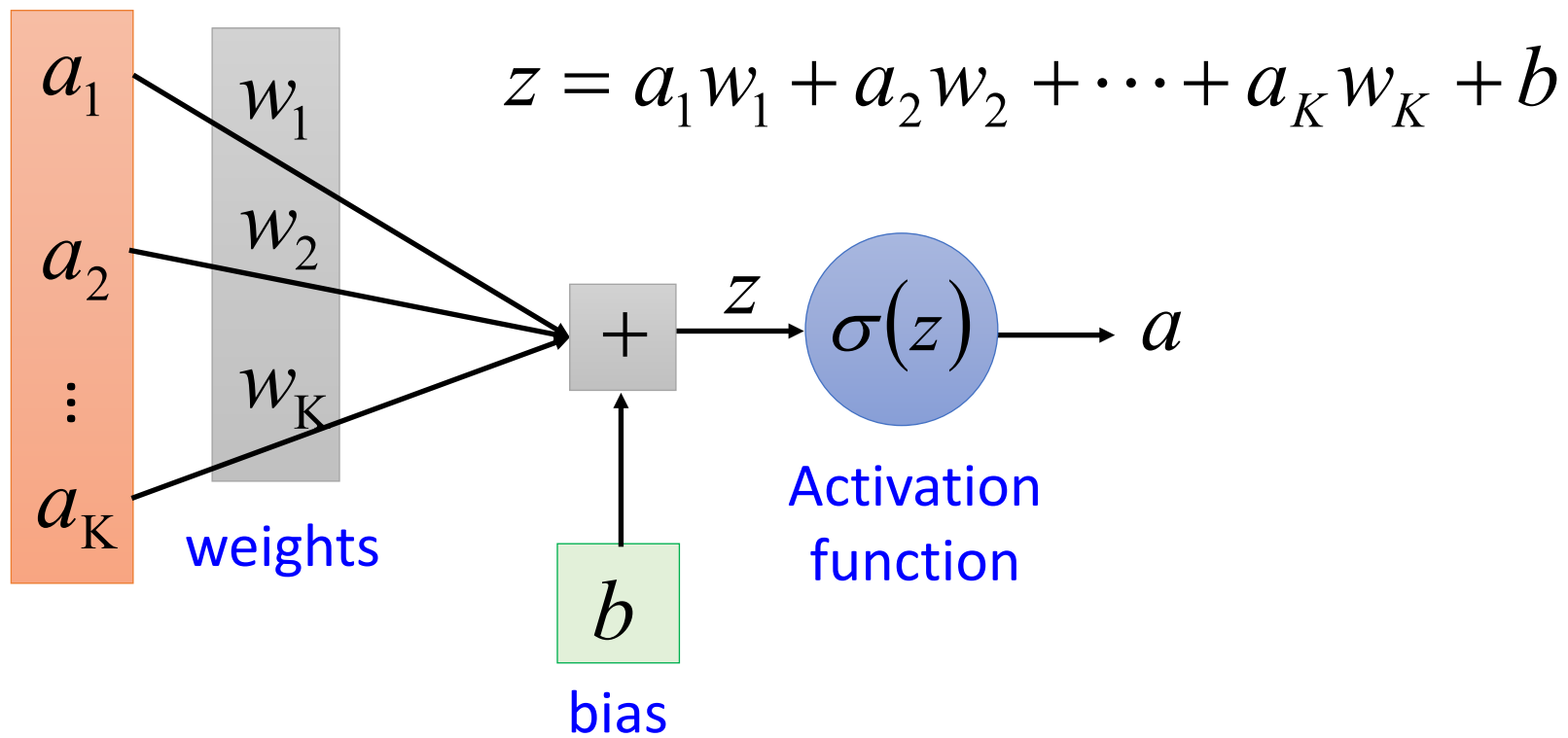
Output



Each dimension represents the confidence of a digit.



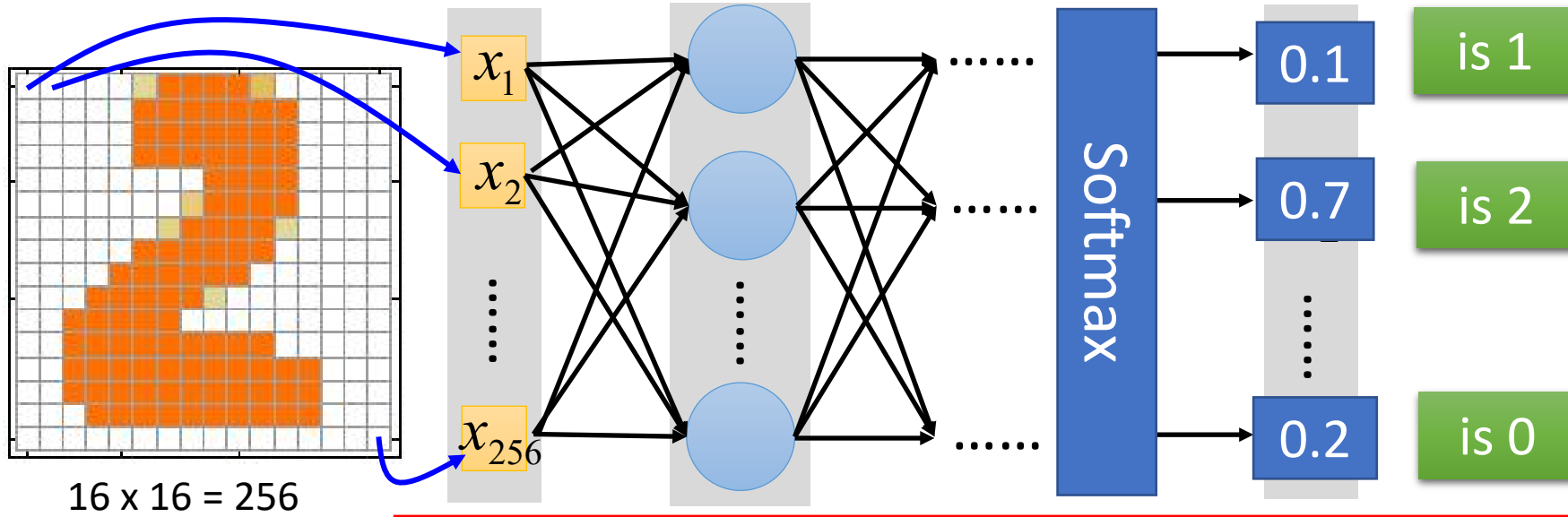
Neuron $f: R^K \rightarrow R$





Training – Setting Network Weights

$$\theta = \{W^1, b^1, W^2, b^2, \dots, W^L, b^L\}$$





16 x 16 = 256

Ink \rightarrow 1

No ink \rightarrow 0

Set the network parameters θ such that

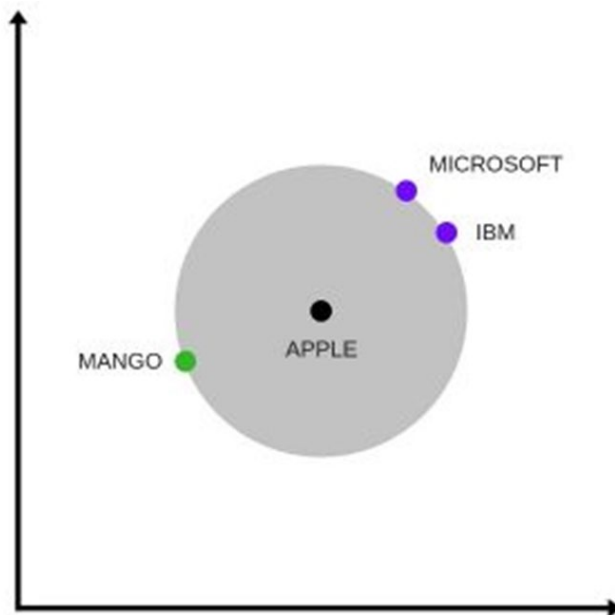
Input:  \rightarrow y_1 has the maximum value

Input:  \rightarrow y_2 has the maximum value



Text – Three Generations of Models

- **Deterministic** – What can you learn by observing words that are consistently “close together?”
 - Quite a bit, e.g., topics
- **Probabilistic** – Word2Vec
 - Predict the probability of a word given its context
 - Predict the probability of the context given a word





Text – Three Generations of Models

- **Natural Language Processing (NLP) – Deep Learning**
 - Bert
 - ELMO
 - GPT 1, GPT 2
 - GPT 3, GPT 3.5
 - ChatGPT
 - GPT 4, other proprietary products

Generative – Generating original text

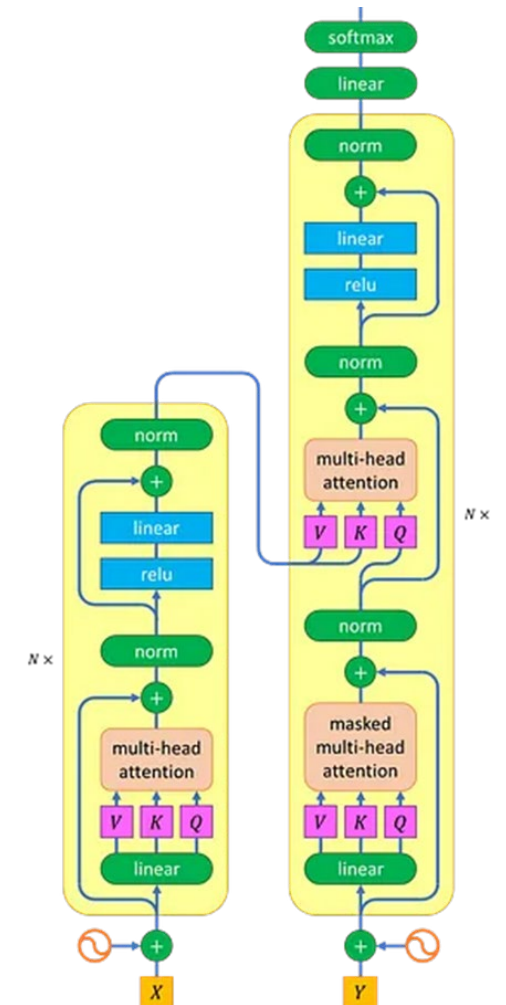
Pre-Trained – Reuse past results with tuning – transfer learning

Transformer – An advanced large language model

From a Google search – “**How is Chat GPT Trained?**”

ChatGPT is trained on a large corpus of text data, such as books, articles, and online content. The model uses this data to learn the syntax, grammar, and vocabulary of human language.

Reinforcement Learning from Human Feedback





Some ChatGPT Use Cases

- Coding
 - Writing code
 - Generating documentation
 - Reviewing code
 - Debugging code
- Education
 - Personalized learning tool
 - Homework assistance
 - Language learning aid
 - Assessment
- Business
 - Customer service
 - Content generation
 - Market research
 - Sales and lead generation
- Content Creation
 - Idea generation
 - Drafting content
 - Editing and polishing
 - Personalized content
 - Production notes
- Entertainment
 - Scriptwriting
 - Music and songwriting
 - Gaming
 - Interactive entertainment

<https://blog.enterprisedna.co/chatgpt-use-cases/#:~:text=ChatGPT%20has%20diverse%20use%20cases,and%20content%20creation%20in%20entertainment.>



Some ChatGPT Risks

- Misinformation
- Manipulation and Misuse
- Lack of Contextual Understanding
- Privacy Concerns
- Bias

<https://blog.enterprisedna.co/chatgpt-use-cases/#:~:text=ChatGPT%20has%20diverse%20use%20cases,and%20content%20creation%20in%20entertainment.>



Plato's Thoughts on the Invention of Writing

*And so it is that you by reason of your tender regard for the writing that is your offspring have declared the very opposite of its true effect. If men learn this, it will implant forgetfulness in their souls. **They will cease to exercise memory because they rely on that which is written, calling things to remembrance no longer from within themselves, but by means of external marks.***

What you have discovered is a recipe not for memory, but for reminder. And it is no true wisdom that you offer your disciples, but only the semblance of wisdom, for by telling them of many things without teaching them you will make them seem to know much while for the most part they know nothing. And as men filled not with wisdom but with the conceit of wisdom they will be a burden to their fellows.



Five Ways ChatGPT is Empowering People With Disabilities

- Cognitive Enhancement (ADHD)
 - Customizable Reminders
 - Motivation and Encouragement
 - Routine Establishment
- Enhancing Communication (Speech Impairments)
- Reading and Writing Assistance (Dyslexia)
- Personal Reminders and Organizational Support (Memory Loss)
- Supporting Education and Learning (Learning Accommodations)

<https://www.entrepreneur.com/living/5-ways-chatgpt-is-empowering-people-with-disabilities/448551>



The Significance of Accessible Communication

Verbal expression is a critical component of communication, enabling us to convey complex ideas and emotions. However, for individuals with disabilities, verbal expression can be an area of significant difficulty, which can make social interactions challenging. Whether due to developmental or acquired disabilities, people with verbal expression impairments may struggle to express themselves effectively, leading to feelings of inadequacy and frustration.

Fortunately, with the advent of advanced language processing technology, such as ChatGPT, individuals with disabilities have new tools available to help overcome these communication barriers. ChatGPT uses sophisticated algorithms to analyze language and generate responses that are tailored to the user's needs, helping people with disabilities express themselves more effectively. The customizable interface means that people with different communication challenges can adjust the tool to suit their specific needs, making it a flexible and versatile solution.

<https://medium.com/@unorganizedchaoscreatives/empowering-voices-how-chat-gpt-is-revolutionizing-communication-for-people-with-disabilities-c218e0b8bdc0#:~:text=Moreover%2C%20Chat%20GPT%20can%20be,not%20dependent%20on%20sensory%20perception.>



ChatGPT as a tool for autistics!!

Discussion

Sorry for the incredibly early morning post but I wanted to share/ask if anyone else has found use in the new AI model ChatGPT.

Being a learning language model, the software can help with just about anything, and I know many people have found it great with assignments for high school/college, myself included.

But I have been using it more recently like it is a small neurotypical brain in my phone. Not only can I run social scenarios through ChatGPT, but it'll talk with me about my special interests for hours without getting bored.

The software has continually provided great advice on tricky social situations, reminders and positive reinforcement in my day to day activities. It can even give you encouragement/motivational messages.

Maybe it's the technology nerd in me, but I love ChatGPT, it's free and I don't think it's being discussed how helpful this software is for people on the spectrum.



The Evolution of the ChatGPT Ecosystem

- Proprietary options, including ChatGPT Plus
- Connections to other environments and tools
 - Internet searches
 - Machine learning pipelines – Azure
 - AutoGPT
 - Plugins
 - Expedia
 - Zillow
 - Reuters
 - Adobe
 - Total is about 70
- Microsoft Build
 - Copilots – Applications that use LLMs to assist people with complex tasks
 - Plugins – Interfaces to other tools
- The Eyes and Ears of ChatGPT



Prompt Engineering

Prompt engineering enhances the performance of generative AI by crafting tailored questions and processes. Effective prompt engineers take into account factors such as context, tone of voice, audience, and examples—as well as offering specific formatting guidance and direction. Creating strong prompts requires four steps:

- Developing an AI persona
- Breaking prompts into distinct parts
- Learning from mistakes
- Providing feedback.

<https://www.westmonroe.com/perspectives/resource/mastering-prompt-engineering-generative-ai>



Prompt Engineering

“Write me a how-to guide on prompt engineering.”

vs.

"You are a management consultant with years of experience with generative AI. Write a 600-word article listing out the top five best practices for effective prompt engineering of ChatGPT, aimed at business leaders. Use short, declarative sentences, descriptive subheads, and bullet points to support each of the five points—as well as examples of good and bad prompts for each of the five best practices."



Using ChatGPT to Enhance Learning Graeme Smith

The Possibility Engine

Prompt your students to write a query in Chat GPT to identify different ways of phrasing a specific job task in their industry. This will allow them to explore multiple perspectives and increase their ability to communicate their ideas effectively.

In a graphic design class, ask your students to write a short pitch for their design project using key terms related to the client's brand. They can then use ChatGPT to generate and refine alternative ways of expressing their pitch and select the most appropriate one based on the brand's tone and style.

Create a lesson on persuasive writing and provide a prompt, such as "Write a persuasive essay on why continuing education is important for career growth." Have your students write their essays and then use ChatGPT to explore alternative ways of expressing their arguments.



Using ChatGPT to Enhance Learning

The Socratic Opponent

In a public speaking class, ask your students to enter a prompt in Chat GPT related to a current event or controversial topic. Have them use Chat GPT's responses to practice constructing a persuasive argument and anticipating counterarguments.

In a business communication class, prompt your students to use Chat GPT to prepare for a negotiation simulation. They can enter different scenarios and questions to help them think through potential responses and develop their argumentation skills.

In a vocational class related to customer service, ask your students to enter a prompt in Chat GPT related to a challenging customer interaction. They can use Chat GPT to generate responses and practice engaging in a dialogue to de-escalate the situation and find a resolution.



Using ChatGPT to Enhance Learning

Collaboration Coach

Assign a group project in which students must research a specific topic related to their vocational field. Have students use Chat GPT to find information and complete tasks and assignments, collaborating with each other to share ideas and discuss findings.

Divide students into groups and assign each group a specific problem to solve related to their field of study. Using Chat GPT, have the groups research the problem and collaborate on a solution, sharing ideas and discussing potential solutions.

Ask students to work together in pairs or small groups to complete a task or project related to their vocational field. Have them use Chat GPT to communicate and collaborate, finding information and sharing ideas to complete the task or project more efficiently.



Using ChatGPT to Enhance Learning

Guide on the Side

Ask Chat GPT for ideas on how to explain a difficult concept in your subject area. You could input “How would you explain the concept of sustainable construction to a beginner?” and use the Regenerate response function to generate alternative explanations. Then choose the most appropriate one for your students.

Create a discussion question prompt for your class, such as “What are some potential drawbacks of using social media in business?” and use Chat GPT to generate additional follow-up questions that will encourage deeper discussion.

Ask Chat GPT to provide examples of how a particular concept can be applied in the real world. For example, in a culinary arts class, ask “Can you give me examples of how to use braising in cooking?” and use the generated responses to illustrate the concept in action.

Use Chat GPT to provide feedback to students on their writing. Ask them to submit a short paragraph on a particular topic and then use Chat GPT to provide feedback on their grammar and structure.



Using ChatGPT to Enhance Learning

Personal Tutor

After a test, prompt students to input their test scores and problematic questions or test items into Chat GPT. Chat GPT can then generate personalized feedback based on the scores, suggesting areas for improvement and study strategies that may be helpful.

As students complete assignments, have them input their work into Chat GPT for review. Chat GPT can provide personalized feedback on areas of strength and weakness in their work, as well as suggestions for improvement.

Ask students to input a specific question related to their field of study into Chat GPT. Chat GPT can then provide personalized feedback on the question, offering alternative perspectives and suggesting resources for further study.



Using ChatGPT to Enhance Learning

Co-Designer

Ask Chat GPT for suggestions on how to design a curriculum that meets the needs of adult learners with different learning styles and abilities.

Use Chat GPT to generate ideas for rubrics to assess student performance in a specific vocational field.

Collaborate with colleagues to develop a new vocational course or update an existing one. Use Chat GPT to generate ideas and brainstorm ways to make the curriculum more engaging and accessible for all students.



Using ChatGPT to Enhance Learning

Exploratorium

Ask students to use Chat GPT to analyze data from their field of study, such as sales figures or customer feedback. They can write queries to explore different aspects of the data, such as “What are the common themes in customer feedback about our product?” or “What patterns can we see in sales figures for the last quarter?”.

Provide students with a dataset related to their vocational field and ask them to use Chat GPT to generate questions and explore the data. For example, they could input “What are the top trends in the data?” or “How can we use this data to improve our processes or products?”.

Ask students to use Chat GPT to practice language skills by generating queries related to a specific dataset. For example, they could input “What are some other ways to say ‘increase’ in relation to our data?” or “Can you generate some sample sentences using the data we have collected?”



Using ChatGPT to Enhance Learning

Study Buddy

Ask students to explain their current level of understanding of a particular topic related to their vocational field to Chat GPT. Have them ask for ways to help them study the material, and Chat GPT can generate suggestions for review material, practice problems, and additional resources.

Use Chat GPT to help students prepare for vocational tasks, such as job interviews. Have them input the type of interview questions they may encounter and use the Regenerate response function to generate alternative answers. This can help students better prepare for a variety of interview scenarios and improve their chances of landing the job.

In a language learning class, ask students to explain a concept or topic they are struggling with to Chat GPT in the language they are learning. Chat GPT can then provide alternative explanations, examples, and practice exercises to help the student better understand the concept.



Using ChatGPT to Enhance Learning

Motivator

After a lesson on workplace safety, ask students to provide a summary of their current knowledge on the topic. Then, have them use Chat GPT to generate ideas for workplace safety games and challenges that will reinforce their learning.

In a class on computer programming, provide a summary of the current level of knowledge on a particular language or skill. Ask Chat GPT to generate exercises and quizzes to help students master that particular skill or language.

Provide a summary of a lesson on a particular job skill and ask Chat GPT to generate challenges that students can complete to further practice and apply the skill in real-world scenarios.



Using ChatGPT to Enhance Learning

Dynamic Assessor

In a language class, ask students to write a short paragraph in the language they are learning. Have students input the paragraph into Chat GPT, and then use the “Summary” function to generate a summary of their current language proficiency level.

In a vocational training course, have students interact with Chat GPT in a tutorial-type dialogue, answering questions related to the course material. Students can then ask Chat GPT to produce a summary of their current state of knowledge, which they can share with their teacher for assessment.

Ask students to input their responses to a quiz or test into Chat GPT. Based on their responses, Chat GPT can provide educators with a profile of each student’s current knowledge level, highlighting areas of strength and weakness. This information can then be used to guide future lesson plans and assessments.



Links

[21 ChatGPT Use Cases](#)

[6 Scary Things ChatGPT Has Been Used For Already](#)

[ChatGPT: Impactful Communication](#)

[How is ChatGPT Trained?](#)

[Use ChatGPT to Enhance Learning Experiences](#)

[Artificial Intelligence and the Assessment of Learning](#)

[5 Ways ChatGPT is Empowering People with Disabilities](#)

[Is ChatGPT a Way to Level the Playing Field for People with Disabilities?](#)

[ChatGPT as an Assistive Technology – Helping Faculty and Students with ADHD](#)

[How ChatGPT is Revolutionizing Communication for People with Disabilities](#)

[ChatGPT: A Game Changer for Dyslexics](#)

[Microsoft Build Brings AI Tools to the Forefront for Developers](#)

[OpenAI Rolling Out ChatGPT Plugins to Plus Users](#)

[Mastering Prompt Engineering](#)



Exercise

Find a couple of friends.

Pick a topic for new course someone in your group would like to teach. Identify your audience for the course. Assume that the course will be taught in an eight-week format. Produce a weekly topic outline for this new course.

Use ChatGPT as a guide.