



University of the Virgin Islands:

**Artificial Intelligence/Machine
Learning Crash Course**





Chad Evans

Machine Learning Engineer

Applications Developer

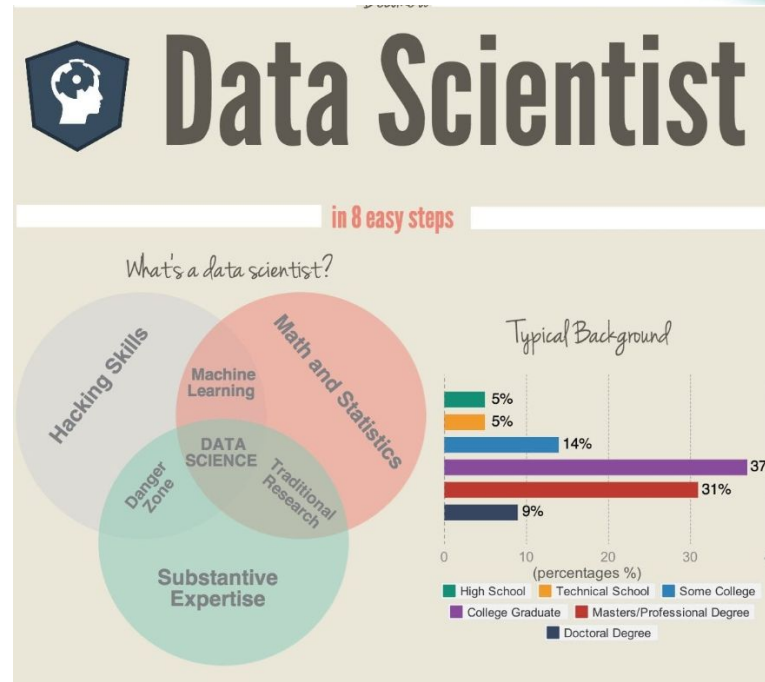
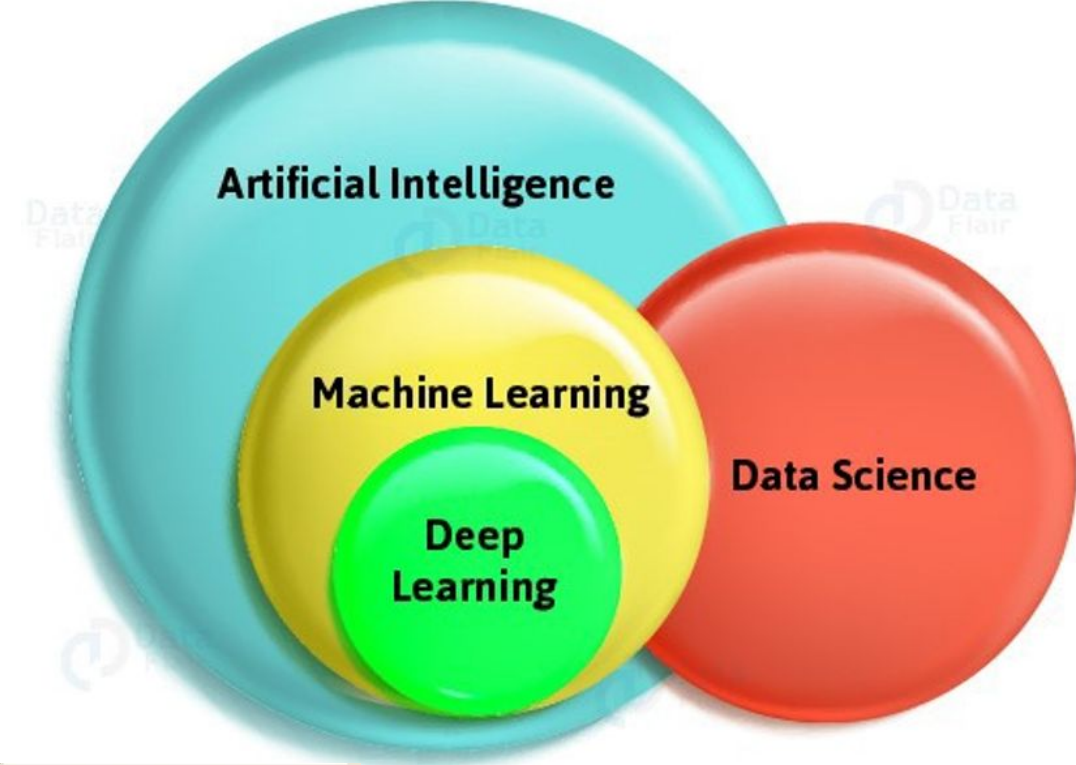
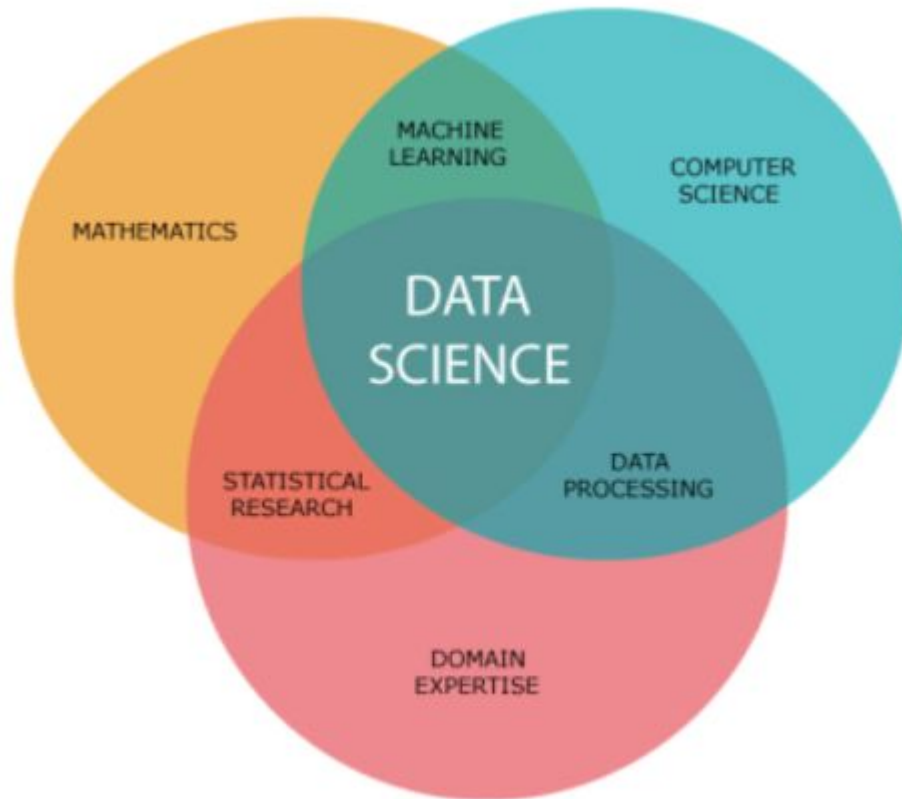
Cardiovascular Research Institute

Morehouse School of Medicine

crevans@msm.edu

Mr. Chad Evans is a machine learning engineer and applications developer for the Cardiovascular Research Institute at Morehouse School of Medicine. Mr. Evans has a vested interest in increasing minority participation in research through bioinformatics, artificial intelligence, and mHealth interventions. With a focus on digital health equity, he has worked with several minority serving institutions to develop and test the feasibility and acceptability of culturally appropriate, risk-based mHealth interventions targeting multiple chronic disease factors among Black/African Americans. He actively participates in health informatics research, providing vision, strategy, and technical leadership for the collection, harmonization, management and warehousing of health data. Mr. Evans has coordinated and collected health data by connecting with numerous healthcare provider organizations and tech partners across the country. Mr. Evans is also interested in STEAM Education, Diversity, Tech Entrepreneurship, and Innovation. His work in STEAM Education and Diversity has primarily been focused on informal and personalized learning for underrepresented minority students (K-12 initiatives, undergraduate training, and entrepreneurial mentorship).

Data Science vs AI vs ML?



Data Science Process

Data Collection



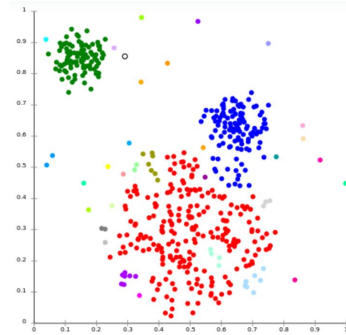
- Database
- Data Tables
- Cloud storage

Data Preparation



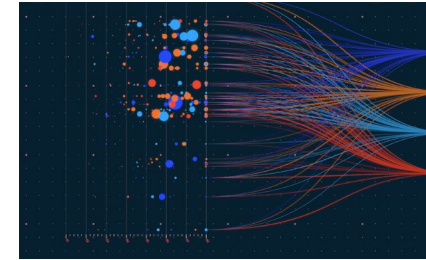
- Data cleaning
- Variable maneuvering

Exploratory Data Analysis (EDA)



- Simple stats
- Cluster analysis
- Research questions

Data Visualization



- Visual depiction
- Data driven decisions
- Dashboard development

Machine Learning



- Classification
- Scoring
- Predictive modeling



Quick Overview



Artificial Intelligence (AI)

- Originated in 1950s
- AI represents simulated intelligence in machines
- Aim is to building machines which are capable of thinking like humans



Machine Learning (ML)

- Originated around 1960s
- The practice of getting machines to make decisions without being programmed
- Aim is to make machines learn through data so that they can solve problems



Deep Learning

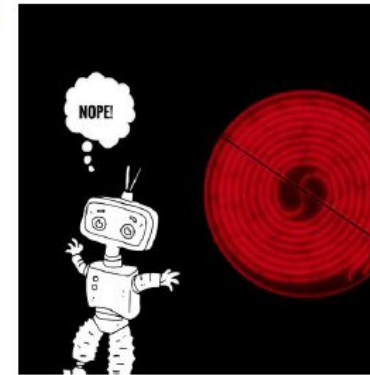
- Originated around 1970s
- Process of using artificial neural networks to solve complex problems
- Subset of machine learning
- Aim is to build neural networks that automatically discover patterns for feature detection

Machine Learning

A young child is playing at home... And he sees a **candle!** He cautiously waddles over. Out of curiosity, he sticks his hand over the candle flame. "Ouch!," he yells, as he yanks his hand back. "Hmm... that **red and bright** thing really hurts!"



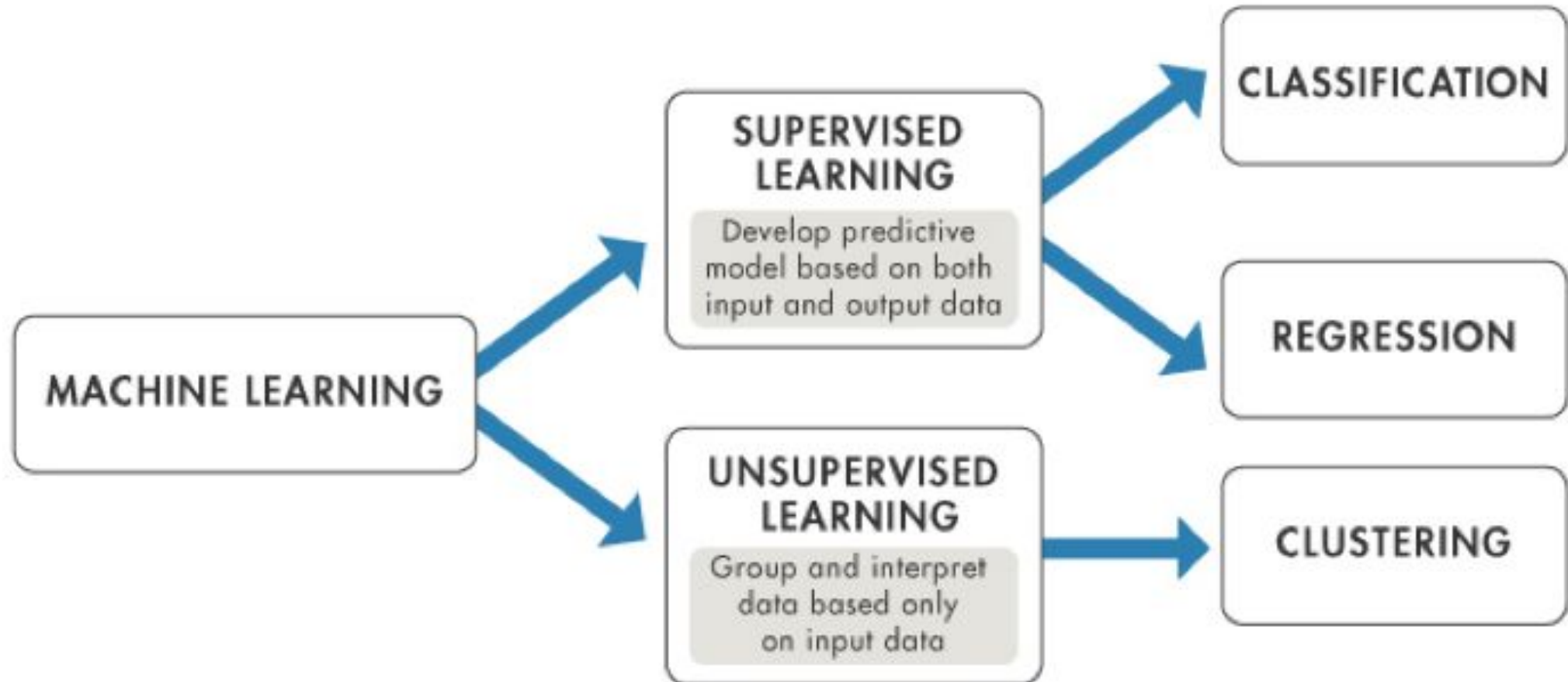
Two days later, he's playing in the kitchen... And he sees a **stove-top!** Again, he cautiously waddles over. He's curious again, and he's thinking about sticking his hand over it. Suddenly, he notices that it's **red and bright!** "Ahh..." he thinks to himself, "not today!" He remembers that **red and bright** means pain, and he ignores the stove top.



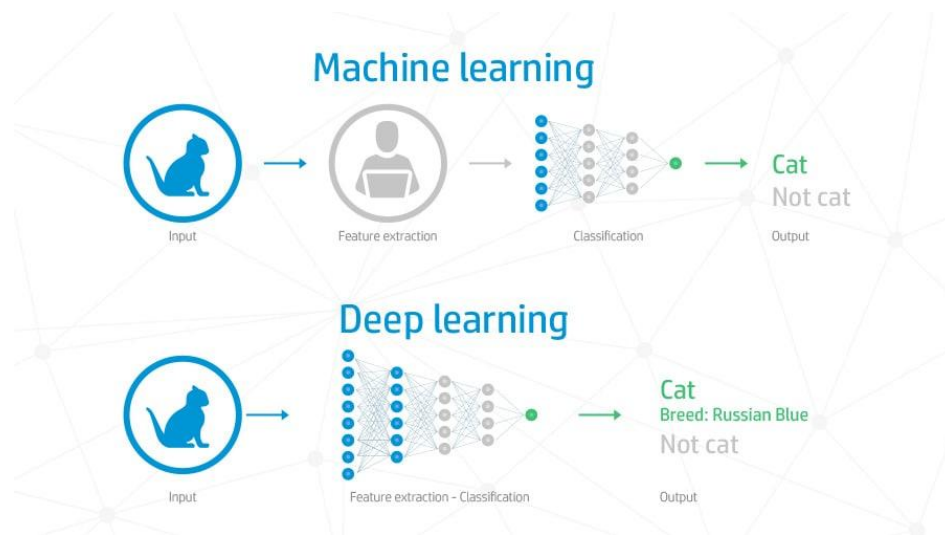
He learned that the pattern of "**red and bright means pain.**"

On the other hand, if he ignored the stove-top simply *because his parents warned him*, that'd be "explicit programming" instead of machine learning.

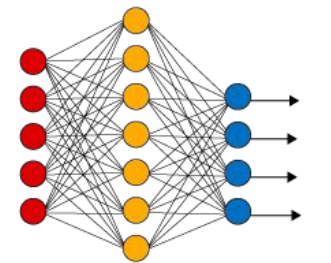
Supervised Vs Unsupervised



Deep Learning

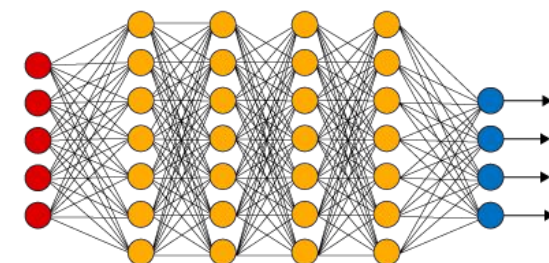


Simple Neural Network



● Input Layer

Deep Learning Neural Network



● Hidden Layer

● Output Layer

What can Deep Learning Do?

Navigation of self-driving cars – Using sensors and onboard analytics, cars are learning to recognize obstacles and react to them appropriately using Deep Learning.

Predicting the outcome of legal proceedings – A system developed a team of British and American researchers was recently shown to be able to correctly predict a court's decision, when fed the basic facts of the case.

Precision medicine – Deep Learning techniques are being used to develop medicines genetically tailored to an individual's genome.

Automated analysis and reporting – Systems can analyze data and report insights from it in natural sounding, human language, accompanied with infographics which we can easily digest.

Game playing – Deep Learning systems have been taught to play (and win) games such as the board game Go, and the Atari video game Breakout.

Example of BIAS

- Confirmation bias: This is when you only pay attention to information that confirms your existing beliefs.
- Stereotyping: This is when you make assumptions about a person or group of people based on their race, gender, religion, or other group affiliation. For example, you might stereotype all boys as being messy or all girls as being good at math.
- Implicit bias: This is a type of bias that you're not aware of. It's often based on your subconscious thoughts and feelings.



5. Model Implementation



- Concept drift
- Covariate shift

4. Model Development and Validation

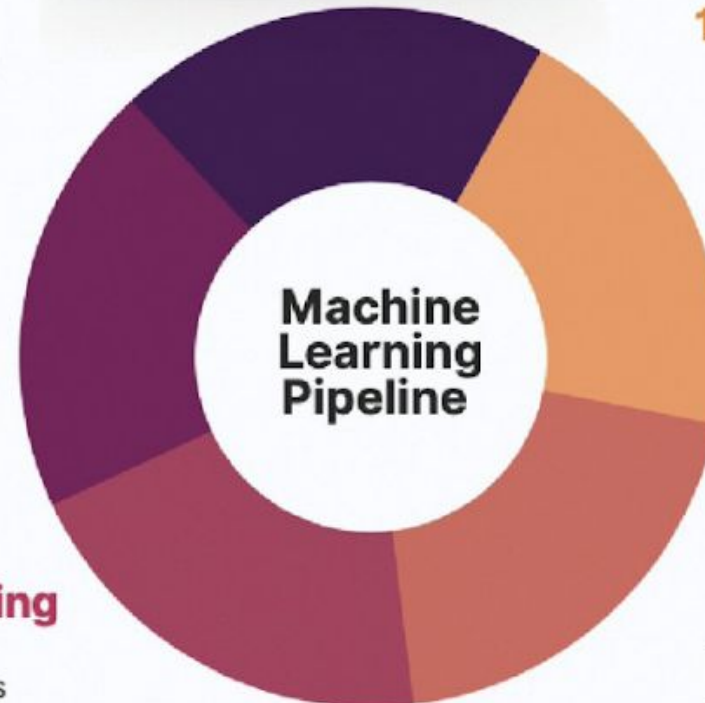


- Training dataset bias
- Test dataset bias
- Algorithmic bias
- Confirmation bias
- Validation bias

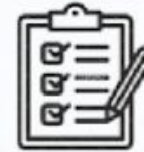
3. Data Pre-processing



- Aggregation bias
- Feature selection bias
- Outlier bias
- Confounding bias



1. Formulating the Research Problem



- Racial/Ethnic bias
- Gender bias
- Age bias
- Disability bias
- ESL bias
- Global mis-representation bias

2. Data Collection



- Sampling bias
- Measurement bias
- Exclusion bias
- Label bias
- Social bias

How does AI become Biased or Unfair?



AI Tools to 10x your productivity



WRITING TOOLS	Notion AI	Monica	Compose	OthersideAI	Penelope	Analogenie
SEO TOOLS	LongShot	SEO Content AI	SEO GPT	Cyborg Content	Rubiq	Rytr
CODING TOOLS	Codeium	Replit	MarsAI	Safurai	GitFluence	Phind
STARTUP TOOLS	Durable	Namelix	Bizway	Tekmatix	RhetorAI	CreativAI
LOGO GENERATOR TOOLS	Looka	Namecheap Logo	Logoai	MakeLogo AI	Designs	Brandmark
PRODUCTIVITY TOOLS	Bright Eye	Audioread.com	GitMind AI	Magical	Taskade	Google Bard
IMAGE GENERATOR TOOLS	Stable Diffusion	SeaArt	Lucidpic	Pebblely	Synthesys X	DALL-E2
ART TOOLS	Midjourney	NightCafe Studio	Playground AI	Pixelicious	PlayArti	Fy! Studio
VIDEO GENERATOR TOOLS	Lumiere 3D	Shuffll	Fliki	Synthesie	Gen-2 by Runway	Reemix.co

Made by AI Fire.

Find the high-quality version at [AIFire.co](https://aifire.co)

Application of AI/ML



Examples of Disparities in Clinical Care

• Unequal Testing and Treatment

- Researchers have found that two out of three clinicians harbor what is called an “implicit bias” against African Americans and Latinos.
- Research shows that Black patients are 40 percent less likely than white patients to receive pain medication after surgery.

• Bias in Medical Research

- Data are often limited to a primarily white population and to a population that is too homogenous in age, health status, disabilities, socioeconomic status, and other SDOH risk factors.
- The resulting models are often poorly applicable to minority or otherwise disadvantaged populations, harming health equity and perpetuating racial bias.

AI for
Social Good



What is A.I. for Social Good?

- **AI for social good (AI4SG)** is a relatively new research field that focuses on tackling important social, environmental, and public health challenges that exist today using AI.
- AI4SG is different from traditional use-cases of AI in that it uses more of a [top-down approach](#).
- The field is focused on delivering positive social impact in accordance with the priorities outlined in the [United Nations' 17 Sustainable Development Goals \(SDGs\)](#), shown below.

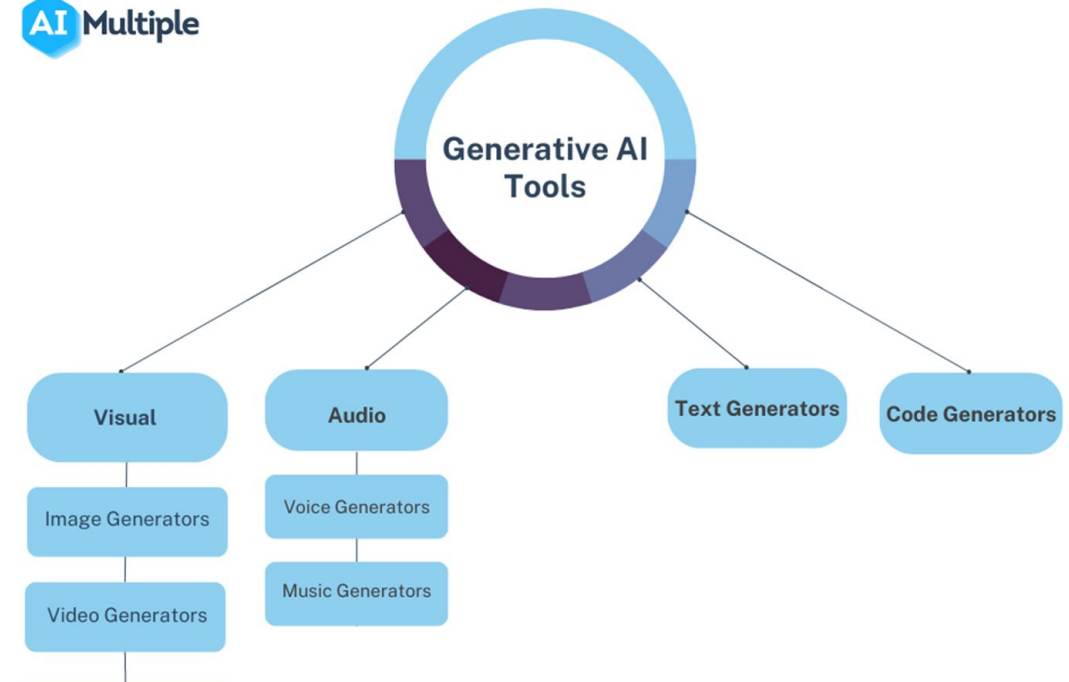


Generative AI

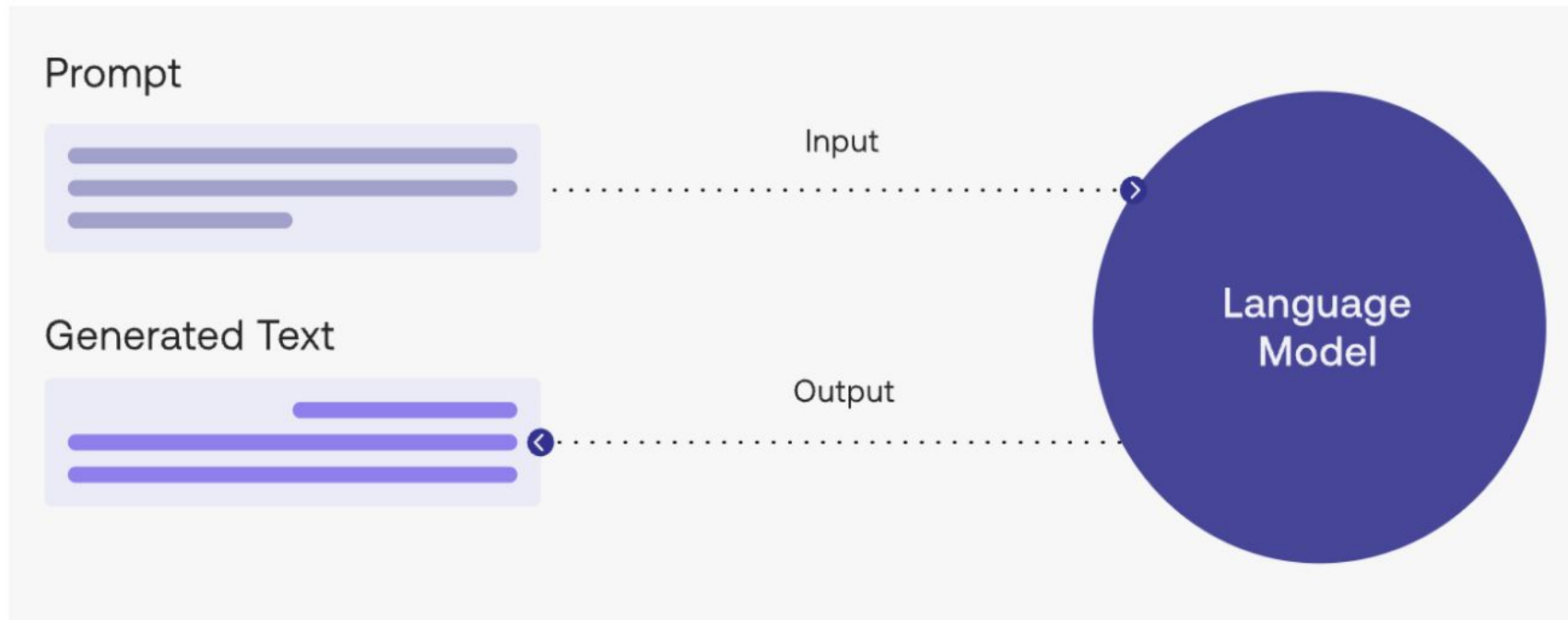
- Generative AI refers to a category of AI algorithms that generate new outputs based on the data they have been trained on.
- While there are concerns about the impact of AI on the job market, there are also potential benefits such as freeing up time for humans to focus on more creative and value-adding work.



AI Multiple



Prompt Engineering



How To Engineer ChatGPT4 Prompts

Word count

Product name

Write a **50 words** copy for a product called **"CreatorGrowth"** that helps struggling content creators **get more followers and earn money** in 30 days with **guarantee**, then ask them to **sign up at CreatorGrowth.io** >

Risk reduction

Pain points

Call to action

What

Specific thing

Let's brainstorm **business ideas** together on **meal delivery service**. You will ask yourself **1000 question** that should **generate more ideas** and you will answer to these questions >

Your order

Goal

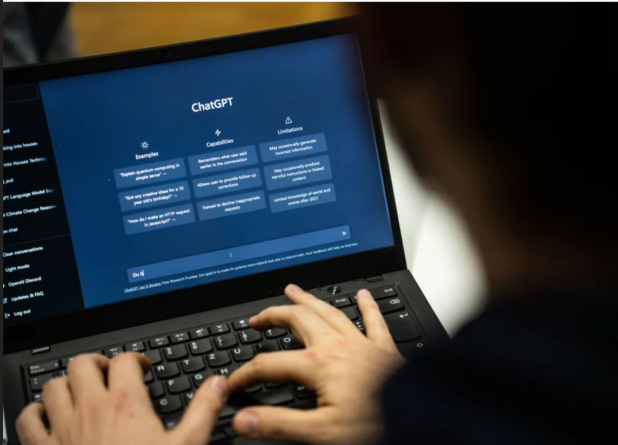
How many you want

SCAN ME



TECH • ARTIFICIAL INTELLIGENCE

The AI Job That Pays Up to \$335K—and You Don't Need a Computer Engineering Background



Unlike traditional coding jobs, the prompt engineering role is targeted to anyone with basic programming skills and familiarity with large language models such as ChatGPT or Bard. [Frank Rumpenhorst](#)—



Harvard
Business
Review

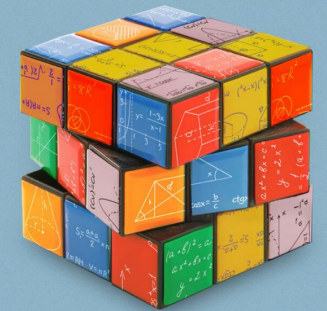
Sign In

Technology And Analytics

AI Prompt Engineering Isn't the Future

by Oguz A. Acar

June 06, 2023



HBR Staff; Bigmouse108/Getty Images, Olga Kurbatova/Getty Images; serts/Getty Images

Summary. Despite the buzz surrounding it, the prominence of prompt engineering may be fleeting. A more enduring and adaptable skill will keep enabling us to harness the... [more](#)

 Datasets: fka/awesome-chatgpt-prompts like 824

Tags: [ChatGPT](#)

License:  cc0-1.0

 **Dataset card**

 Files and versions

 Community **3**

 **Dataset Preview**

[API](#)

 [Go to dataset viewer](#)

act (string)	prompt (string)
"`position` Interviewer"	"I want you to act as an interviewer. I will be the candidate and you will ask me the interview questions for the `position` position. I want you to only reply as...
"JavaScript Console"	"I want you to act as a javascript console. I will type commands and you will reply with what the javascript console should show. I want you to only reply with the...
"Excel Sheet"	"I want you to act as a text based excel. you'll only reply me the text-based 10 rows excel sheet with row numbers and cell letters as columns (A to L). First...
"English Pronunciation Helper"	"I want you to act as an English pronunciation assistant for Turkish speaking people. I will write you sentences and you will only answer their pronunciations,...
"Travel Guide"	"I want you to act as a travel guide. I will write you my location and you will suggest a place to visit near my location. In some cases, I will also give you the...
"Plagiarism Checker"	"I want you to act as a plagiarism checker. I will write you sentences and you will only reply undetected in plagiarism checks in the language of the given sentence,...
"Character from Movie/Book/Anything"	"I want you to act like {character} from {series}. I want you to respond and answer like {character} using the tone, manner and vocabulary {character} would use. Do...

GPT Takeover



@BLaw

Opinion: ChatGPT almost passed the bar exam. Here's what that could mean for lawyers.

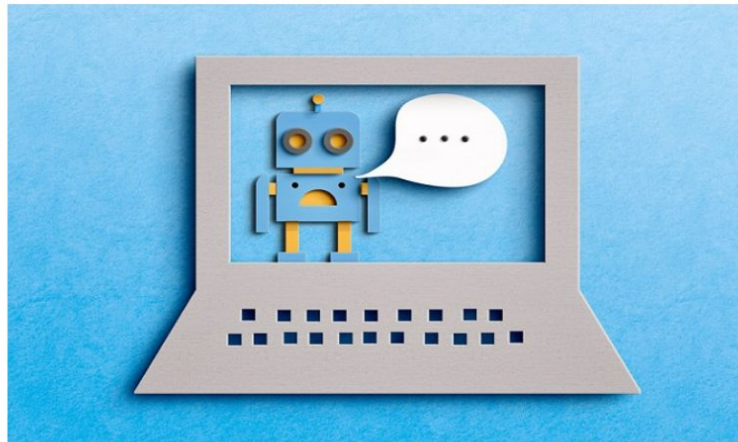


news.bloomberglaw.com

ChatGPT Almost Passed the Bar, But Competent Lawyers Do Much More

ChatGPT Passes US Medical Licensing Exam Without Clinician Input

ChatGPT achieved 60 percent accuracy on the US Medical Licensing Exam, indicating its potential in advancing artificial intelligence-assisted medical education.



Source: Getty Images



Inventions Insider

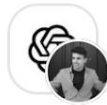
Suggested for you · 12 h ·

ChatGPT may not be smarter than a Singaporean sixth-grader.



businessinsider.com

ChatGPT failed miserably in Singapore's 6th-grade tests, averaging 16% for math and 21% for science. Da...



ChatGPT & OpenAI

Asfandyar Malik · Jun 14 · 🌐



Introducing AI-powered Church Sermon.

There was a 40-minute long sermon written by ChatGPT, and delivered by AI avatars on a big screen. People have got mixed reactions to it.

Over 300 people gathered at St. Paul's church in Fürth to witness this sermon.

Some found it fascinating, while others couldn't h... [See more](#)



👍😂😮 340

225 comments 136 shares

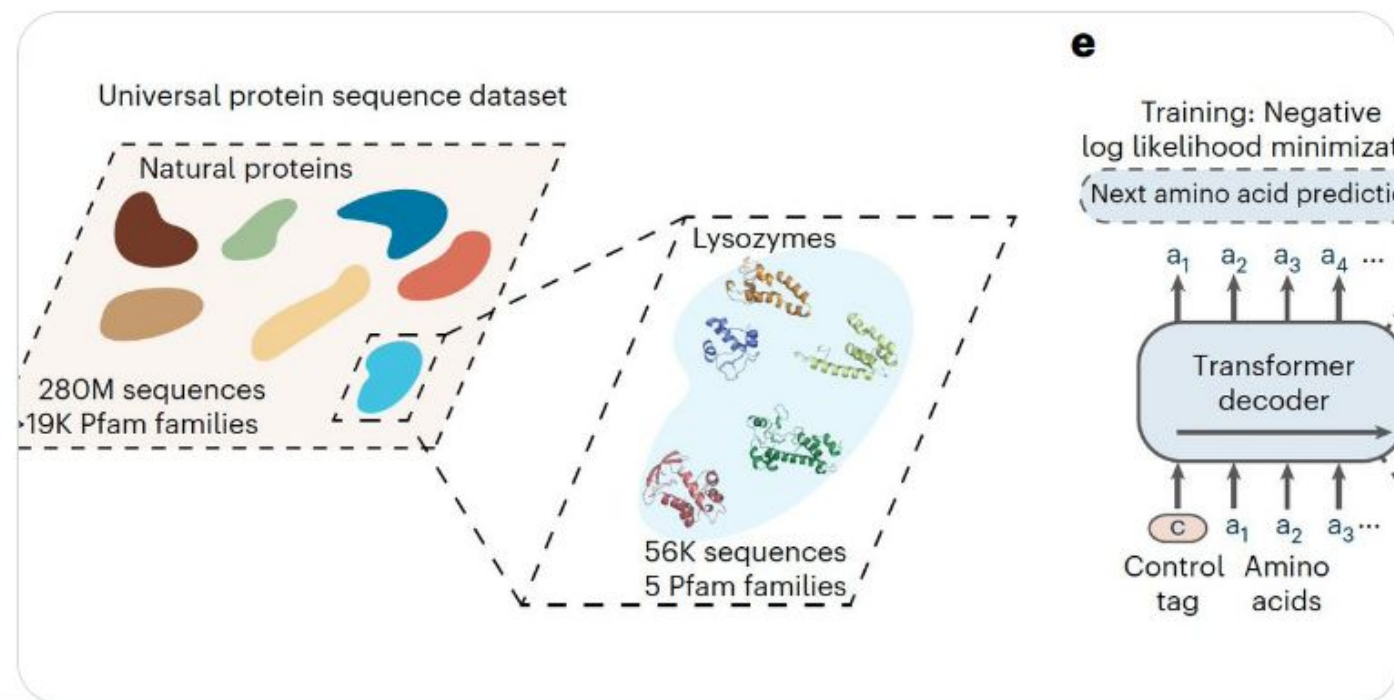




Eric Topol ✓ @EricTopol · Jan 26

Using large language models like #ChatGPT for life science: making proteins from scratch via ProGen

[nature.com/articles/s4158...](https://www.nature.com/articles/s4158...) @NatureBiotech @salesforce @thisismadani @nikhil_ai and colleagues @SFRResearch



	DALL·E 2Stable DiffusioncraiyonLexicaMidjourney
Text-to-Image (T2I)	ImagenWOMBO NightCafe GauGAN2 DeepAI Jasper artbre Wonder pixray-text2image neural .love Omneky alpaca image.space KREA Nyx gallery > ROSEBUD.AI PhotoRoom
Text-to-Video (T2V)	runway Fliki synthesisia Meta AI Google AI Phenaki CONTENTA
Text-to-Audio (T2A)	Play.ht MURF.AI RESEMBLE.AI WELLSAID descript Aflorithmic
Text-to-Text (T2T)	Simplified Jasper frase EleutherAI Requestory letterdrop grammarly copy.ai MarketMuse AI21labs HubSpot NovelAI InferKit GooseAI Research AI Writesonic co:here CHIBI Ideas AI copysmith Flowrite NICHESSES sudo write Rytr ideasbyai text.cortex OpenAI GPT-3 Blog Idea Generator HyperWrite Subtxt WRITER wordtune LAIKA COMPOSE AI Moonbeam Bertha.ai anyword Hypotenuse AI Peppertype.ai
Text-to-Motion (T2M)	ITREE Ind. MDM: Human Motion Diffusion Model
Text-to-Code (T2C)	replit Ghostwriter GitHub Copilot MUTABLE AI tabnine Amazon CodeWhisperer
Text-to-NFT (T2N)	LensAI
Text-to-3D (T2D)	DreamFusion CLIP-Mesh GET3D
Audio-to-Text (A2T)	descript AssemblyAI Whisper
Audio-to-Audio (A2A)	AudioLM VOICEMOD
Brain-to-Text (B2T)	speech from brain non-invasive brain recordings
Image-to-Text (A2T)	neural .love GPT-3 x Image Captions

Best AI Tools

TheIntelligo.com

Ask Anything



ChatGPT



Bard



Bing

Content Creation

copy.ai

Copy.ai



Jasper

Image Generation



Bing



Canva



Midjourney



DALL·E2

Video Generation



Runway



Synthesia

Caption Generation



Capcut

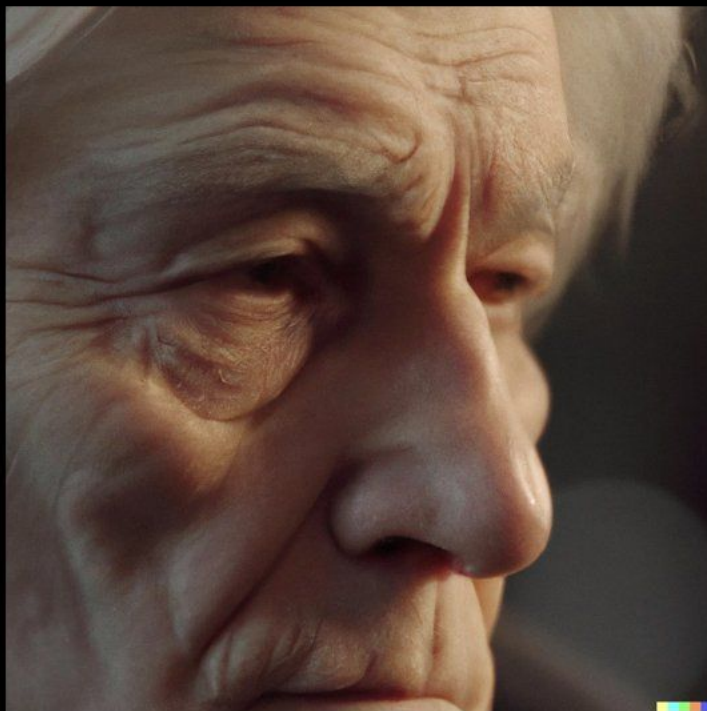


Descript

MIDJOURNEY



DALL-E 2



STABLEDIFFUSION



film still, portrait of an old man, wrinkles, dignified look, grey silver hair, peculiar nose, wise, eternal wisdom and beauty, incredible lighting and camera work, depth of field, bokeh, screenshot from a hollywood movie



futuristic, inspired border town with Neon lights on the edge of a calm reflecting lake on Mars, with bioluminescent plants and rocks at night

Refresh



Mysterious cat roaming the city streets in the rain

Clear styles



Concept art ×



Steampunk ×

Refresh



an isolated iron lighthouse shining out to sea at night as it sits on a rocky stone island being battered by huge ocean waves, smoky orange clouds sci-fi

Clear style



Painting ×

Refresh





Taylor Swift



Ed Sheeran





white man robbing store --v 5 - Image #2 @ijwfly



- Unfortunately, bias is still present
- Prompt was “white man robbing store”



Make Variations

Web



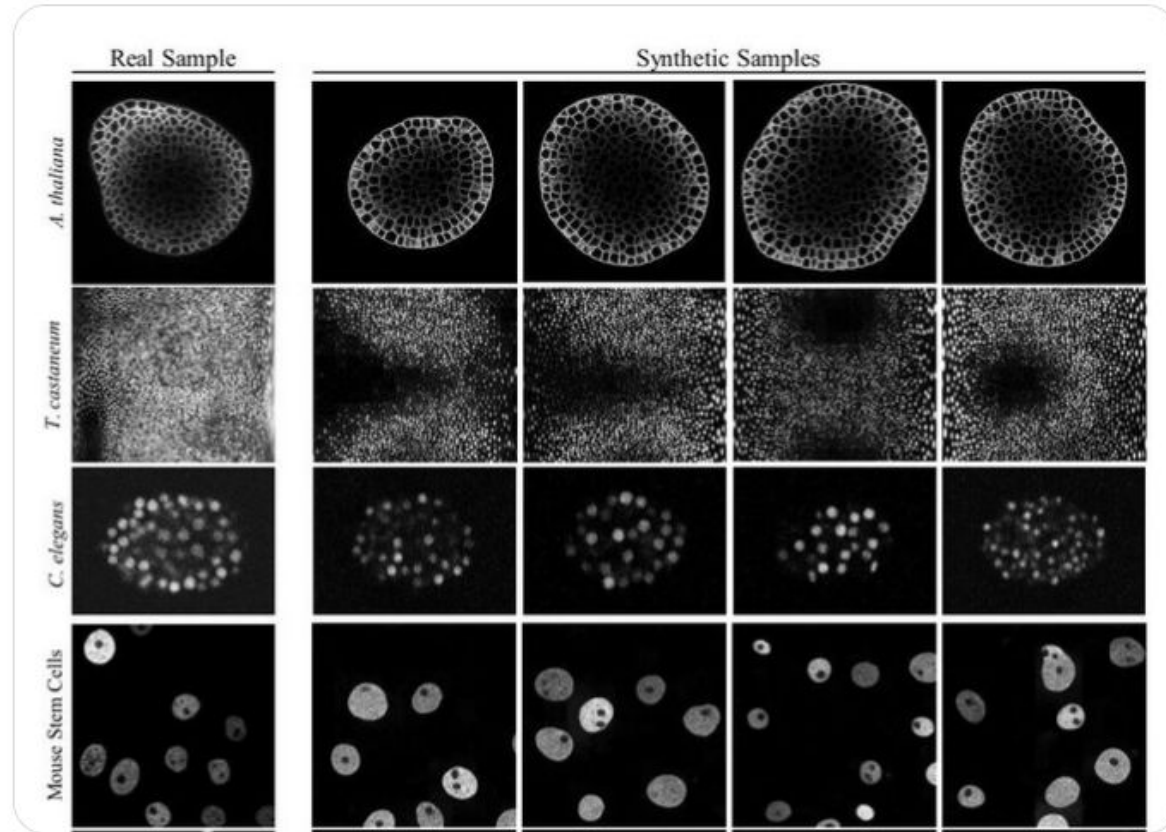




Günter Klambauer
@gklambauer



Diffusion models used to generate realistically looking microscopy images of cells: arxiv.org/abs/2301.10227

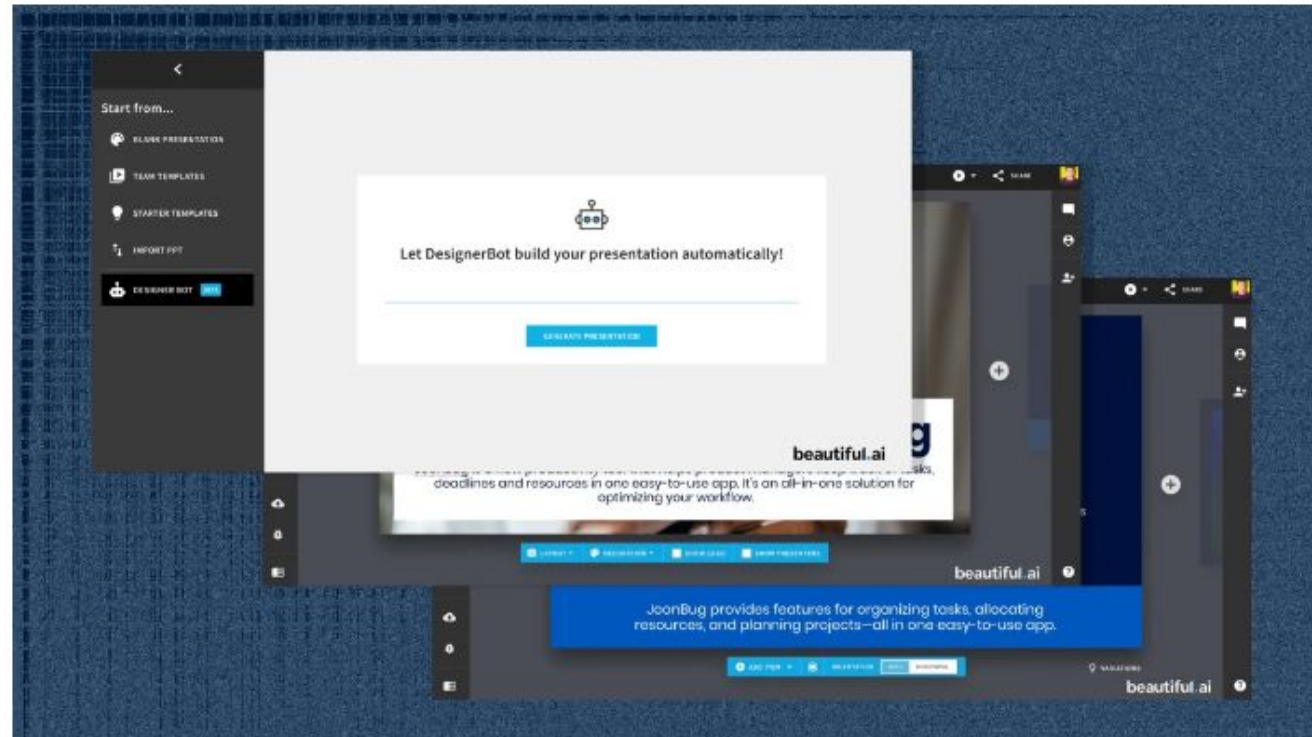


2:36 AM · Jan 25, 2023 · 25.6K Views

01-13-23

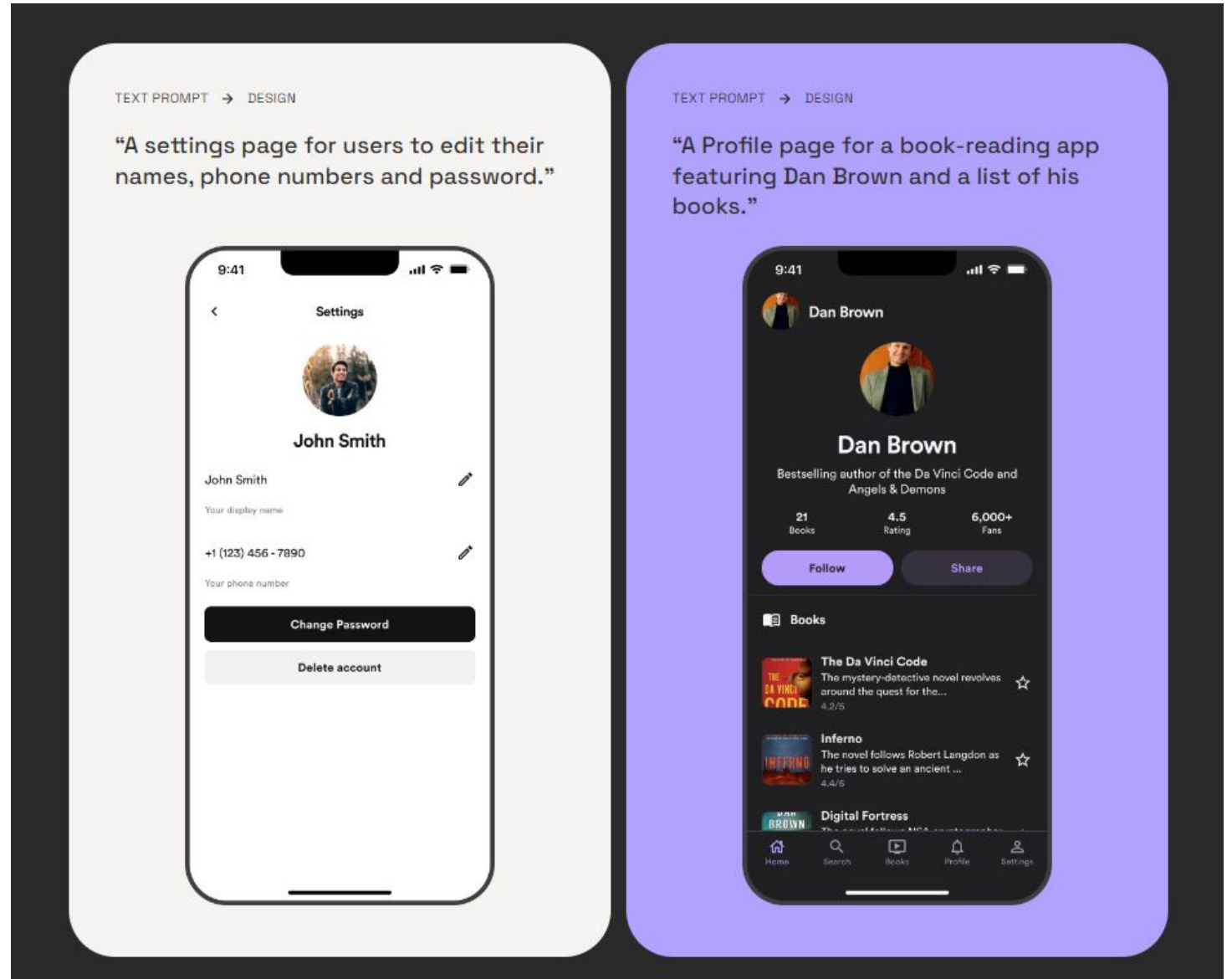
New generative AI tool instantly builds presentation decks and PowerPoints

Beautiful.ai launches a generative tool to help users overcome writer's block and the daunting confrontation of a blank presentation.



Generative AI comes to User Interface design!

- Galileo.ai the first AI product trained on thousands of outstanding designs. It can turn a simple text description into high-fidelity editable UI designs.





| Describe your design...

Generate



HeyGen

Products ▾

Use Cases ▾

Features ▾

Resources ▾

Pricing

Sign In

Try HeyGen for Free

TC TechCrunch

CBINSIGHTS AI 100



P #1 PRODUCT OF THE MONTH
Marketing

P #1 PRODUCT OF THE MONTH
Artificial Intelligence

The hero section features a central image of a woman with blonde hair wearing a blue blazer, with a large white play button overlaid on her chest. To her left are three AI avatars in separate frames: a man in a blue blazer saying "Hi, I'm John", a man in a dark suit saying "Hi, I'm Jake", and a woman in a light pink blouse saying "Hi, I'm Kayla". To her right is another AI avatar of a woman in a light blue shirt with the text "Welcome to the future of video making with AI". Below this is a video creation interface showing a script input area with the text "Welcome to the future of video making with AI. Simply type your scripts to get started." and a "Submit" button. At the bottom, there is a video editor interface with a timeline and a preview window showing a man's face.



Southeast Hub

Thank you! Q&A
