

# NEWSLETTER



## AI RESEARCH

Dive into the world of the latest AI research



## INDUSTRY NEWS

Viral news and innovations in the AI industry



## STUDENT EXPERIENCE

Hear from fellow students who have been working with AI at any capacity



## NEXIE

Hi there! I'm Nexie, your new friendly neighborhood mascot of the AIC Newsletter. My circuits are buzzing with excitement as we explore the limitless potential of AI together. So buckle up—let's unlock the future of AI, one byte at a time!

## OPENAI'S OPERATORS

OpenAI's Operator is a new AI agent that simplifies web-based tasks like booking reservations or shopping online. It uses a virtual browser and it can interact with a web page by typing, clicking, and scrolling, just like a human would. It's designed to be easy to use, requiring no technical skills—just tell it what you need in plain language. While it is still currently a research preview, Operator has the potential to make the internet more inclusive, helping people with limited tech skills or disabilities navigate the digital world with ease.

### How Does it Work?

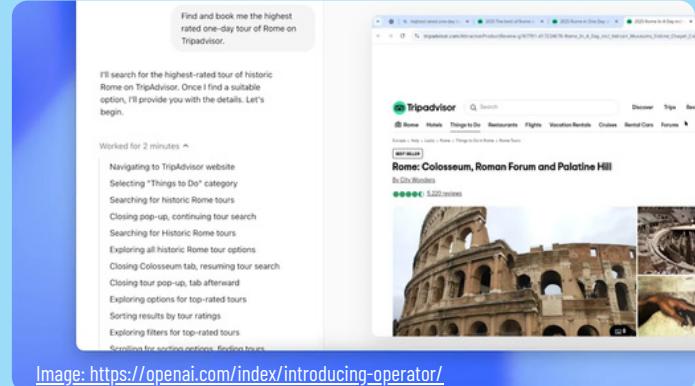
OpenAI's Operator is designed to autonomously perform web-based tasks using virtual browser interaction. Here it uses a virtual browser to navigate websites, mimicking human actions like clicking, typing, and scrolling. This is different from automation processes that rely on APIs, Operator interprets the visual layout of a webpage, making it compatible with any website.

At its core, it is powered by CUA (Computer-Using Agent), which combines GPT-4o's vision capabilities with human-like reasoning. CUA processes raw pixel data from screenshots, identifies interface elements, and uses virtual mouse and keyboard inputs to perform tasks. For critical actions like payment methods and logins, Operator gives back control to the user, asking for its confirmation, ensuring that users still maintain control over the important operations.

### How Does It Compare to Competitors?

Operator isn't the only AI agent out there. Anthropic's Claude and Google's Project Mariner are also working on similar tools, but there are some key differences:

- **Operator:** Focuses on simplicity and accessibility. You don't need any coding knowledge—just tell it what to do in everyday language. It's great for tasks like online shopping or filling out forms.
- **Claude's Computer-Use:** Can interact with desktop environments, but it requires some technical know-how to set up. It's powerful but less user-friendly for non-techies.
- **Project Mariner:** Still in the research phase, but it's designed to work seamlessly with Google services like Gmail and Google Docs.



### So, Why Is Operator Such A Big Deal?

Operator is not just about convenience - It has the potential to make the internet more accessible for everyone:

- For people with limited tech skills : Operator can help those who struggle with computers, like older adults.
- For People with Disabilities: With voice integration, Operator can easily become a powerful tool for individuals with mobility challenges, or visual impairments.
- For Institutions: Operator could streamline tasks that use web-based applications.

**"Operator is here to make the internet easier for everyone!"**



### Citations

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- [2] S. Altman, Y. Kumar, C. Chu, and R. Nakano, "Introduction to Operator & Agents," YouTube, 2025. [Online]. Available: <https://www.youtube.com/watch?v=CSE77wAdDLg>.
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**Artificial intelligence (AI) and CRISPR gene editing are two groundbreaking technologies that, when combined, are already making huge leaps in medicine, agriculture, and environmental science. Traditionally, genetic research required vast computational power, often taking weeks or months to process complex datasets. However, AI is accelerating discoveries by analyzing massive genomic databases, revealing new gene-editing possibilities. Researchers are using AI to identify previously unnoticed small gene-editing proteins, predict RNA molecules with better heat tolerance, and optimize CRISPR's precision in treating genetic disorders. With AI's power to speed up data analysis, these breakthroughs are quickly shifting from concepts to real-world applications, happening much faster than ever before.**

### What is CRISPR?

CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is a gene-editing tool that allows scientists to precisely modify DNA. Think of it like a genetic "scissors" that can cut and alter specific sections of an organism's genetic code. Originally discovered as a natural defense mechanism in bacteria, CRISPR has become one of the most powerful breakthroughs in modern science, with the ability to treat genetic diseases, improve crops, and even work on climate change.

### Why should you care?

Because this technology isn't just about science fiction-like gene modifications—it's about solving real-world problems. Imagine being able to develop crops that can survive extreme weather, or create bacteria that can break down pollution. The possibilities are endless, and that's why CRISPR is one of the most talked-about innovations of our time.



Image: <https://geneticliteracyproject.org/>

### How AI is Supercharging CRISPR

AI is transforming this process in several ways:

- Discovering New Gene-Editing Tools – AI models are scanning massive genomic databases to discover small, previously unnoticed proteins that could expand CRISPR's capabilities.
- Predicting CRISPR Targets with Precision – AI algorithms help predict the most effective CRISPR editing sites while minimizing unnecessary genetic modifications, making treatments safer and more reliable.
- Enhancing Agricultural Resilience – Machine learning is identifying RNA molecules that boost heat and drought tolerance in plants, resulting in more climate-resistant crops.
- Accelerating Medical Breakthroughs – AI is being used to design and test CRISPR-based therapies faster, reducing the time needed to develop therapies for genetic diseases.

### Looking Ahead: What's Next for AI and CRISPR?

While still in its early stages, the AI-CRISPR revolution is already delivering real-world results. Moving forward, we can expect AI to refine CRISPR applications further, improving accuracy and minimizing unintended genetic modifications. Researchers are also exploring ways to use AI to identify entirely new genome-editing techniques beyond CRISPR. With continuous advancements, this fusion of AI and genetic engineering has the potential to tackle some of humanity's biggest challenges—paving a new era of scientific discovery and innovation.

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### How Can We Use It?

Currently, Deep Research is only available to ChatGPT Pro users. Using this tool requires a multi-step process as follows:

1. The user submits a request, whether that's a legal case summary, competitive analysis, personalized report, etc.
2. AI clarifies the task and asks follow-up questions to refine the research scope
3. Agent searches the web, analyzing hundreds of sources including news articles, research papers, online databases, etc.
4. Findings are synthesized and key points are extracted into a structured report including proper citations that are delivered to the user

The entire process can take between 5 to 30 minutes, allowing individuals to step away and focus on other tasks in the meantime. Users can provide additional context to their request by attaching relevant files, and once the research has begun, a summary is available showcasing the steps taken and sources used.

### Can Deep Research Replace Human Researchers?

One of the greatest concerns that individuals have surrounding the evolving forms of AI is its potential to replace humans. The idea that AI can fully replace humans in the realm of deep research is largely an illusion. Although AI can summarize information from the web in a matter of minutes, it cannot form its own assumptions, think creatively, or understand different perspectives. AI tools, no matter how efficient, cannot replace the depth of a skilled researcher or replicate human intelligence. AI is also prone to generating false information and struggles to distinguish fact from fiction. These limitations affect its ability to 100% replace humans in the field. Critical thinking and information synthesis are crucial components of research—areas where AI falls short.

## OpenAI's Deep Research

Deep Research by OpenAI represents the next evolution in artificial intelligence. Marketed as a research assistant, this tool is designed to synthesize large amounts of data in minutes—a task that would take a human researcher hours to do. Integrated as a new feature in ChatGPT, this agent can locate, analyze, and compile online sources to create a comprehensive report. Operating at the level of a research analyst, it is powered by the OpenAI o3 model that optimizes data analysis. This tool can search and interpret text, images, and PDFs to manage information effectively.

### Why Is It Important?

This new agent for deep research is designed to assist individuals in areas such as finance, science, and engineering, where in-depth knowledge exploration is essential. With its ability to deliver precise and thorough research, it can enhance efficiency through its documented reports and clear citations, ensuring information is easily verifiable. It outperformed many other models by scoring a 26.6% on Humanity's Last Exam—an AI evaluation testing across a broad range of subjects. The tool can be equally useful for shoppers who would like hyper-personalized recommendations, and are looking to make significant purchases that require careful research such as cars or appliances.

### Citations

- [1] OpenAI, "Introducing deep research," OpenAI, Feb. 18, 2025. [Online]. Available: <https://openai.com/index/introducing-deep-research>. (Accessed: Feb. 18, 2025).
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## Is The Rise of AI Music a Symphony or Dead End?

Have you ever heard about dead internet theory? It's the concept that instead of humans, algorithms and bots produce the majority of the digital material that modern users encounter daily. Recent rumours suggest that some of the biggest musical artists in the industry are using AI to create music to a level of quality that causes it to be unsuspected by listeners. This is backed by Deezer, a music streaming service, that recently disclosed that AI has been creating 10% of all new music released through its platform.

Because of recent advancements of AI technology, the barrier to entry in the music industry is lower than it's ever been. On paper, the opened doors to creative opportunity should promise a variety of emerging genres and innovative sounds. However, as artificial intelligence puts out more music at an unprecedented pace, it risks the loss of emotional depth and personal touch provided by human artists that makes music so special.

As the debate on AI music unfolds, the music industry faces a pivotal discussion: Does artificial intelligence truly possess the ability to enhance music in positive ways? Or is it simply a bubble that is soon to burst?

### Citations

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Image: <https://openai.com/sora>

## Sora AI: Revolutionizing Visual Storytelling

Sora AI, one of the latest and greatest innovations from OpenAI just released to the public, was and still has been making headlines as a groundbreaking text prompt to video generator. This state of the art tool uses advanced algorithms to form visuals so lifelike, that they consistently rival videos captured on actual film!

In an ever expanding world of digital content creation, Sora release to the general public has rapidly become a topic of intense discussion. With this lowered barrier of entry, creators are empowered to produce high quality visuals without the regular constraints of tight budgets or expensive equipment, and instead just a 20 dollar payroll. Sora's capabilities are even being recognized by decorated filmmakers such as Tyler Perry who put an \$800 million studio expansion on hold due to "Sora and what I'm seeing".

While the tool could lead to an explosion of visually captivating content, it also raises the question of the future regarding authenticity and expression in art. Due to its ability to create stunning visuals seamlessly, distinguishing between AI and human created content may become increasingly challenging.

As the landscape of entertainment evolves, Sora stands at the forefront of this metamorphosis by pushing boundaries, inviting innovation, and compelling artists to redefine storytelling in a digital era.

### Citations

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Image: <https://www.billboard.com/lists/ways-ai-has-changed-music-industry-artificial-intelligence/>



Image: <https://blogs.worldbank.org/en/education/from-chalkboards-to-chatbots-in-Nigeria>

## Kids Get Caught Using AI In Class !! Teachers Love It !?

Recently, 800 first year secondary students attended after-school English classes twice a week. Each session had a teacher which guided students to use Microsoft Copilot as a tool to learn. These students were conversing with the AI which provides a more natural approach to learning other languages! This approach prioritizes students, inspires teachers, optimizes immersion, and empowers participants with relevant materials. "AI helps us to learn, it can serve as a tutor, it can be anything you want it to be, depending on the prompt you write," says Omorogbe Uyiosa, a student from the Edo Boys High School.

As the program went on, researchers found that it boosted learning overall since students were able to explore and master other topics independently. It also encouraged deeper engagement which resulted in significant gains!

Obviously, AI can sometimes produce hallucinations. That is why the teachers are there to clarify any misunderstanding. One student asked if P = NP and the tool reported that P != NP. Of course, the teacher had to intervene and explain that this major problem in theoretical computer science has unfortunately not been solved yet. With the impact of this program, perhaps one of these students will be inspired to tackle this unsolved problem in the future.

### Citations

- [1]"From chalkboards to chatbots in Nigeria: 7 lessons to pioneer generative AI for education," World Bank Blogs, 2024. <https://blogs.worldbank.org/en/education/From-chalkboards-to-chatbots-in-Nigeria> (accessed Feb 21, 2025)
- [2]"From chalkboards to chatbots: Transforming learning in Nigeria, one prompt at a time," World Bank Blogs, 2025. <https://blogs.worldbank.org/en/education/From-chalkboards-to-chatbots-Transforming-learning-in-Nigeria> (accessed Feb 21, 2025)

## AI Educators: Are Teachers Cooked !?

While some educational institutions have been leveraging AI to be teaching assistants, a few schools in the UK and USA are taking the approach a bit differently. They're replacing teachers!

One school in Arizona is trying out a new educational model centered around AI and a two-hour school day. During the two hours, students will be going through lectures that the AI is teaching, and from there it will track their progress in real time. This means that each student has a tailored curriculum adapted to their learning style! The rest of the day is filled with hands-on workshops that the teachers (real people) take care of.

To answer the title's burning question, teachers are not cooked. The idea behind this is that AI allows for hyper-personalized learning which can make for more successful students. The extra time freed up for life-skills make the students more knowledgeable overall. Having actual humans teach these workshops benefits the students in that it allows for a more personal connection and mentorship, ensuring that students develop critical thinking, creativity, and social skills that AI alone cannot provide.

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Image: <https://pixabay.com/images/search/artificial%20intelligence/>

## AI IN HEALTHCARE

## AI's Superpower: Predicting Diseases Before They Happen

Artificial intelligence is revolutionizing healthcare by predicting diseases long before symptoms appear. The UK's National Health Service (NHS) has tested an AI tool capable of detecting type 2 diabetes risks up to 13 years in advance. By analyzing subtle heart rhythm changes in electrocardiograms (ECGs), this technology identifies early warning signs that would be invisible to the human eye, allowing doctors to recommend lifestyle changes or early treatment to prevent complications.

Machine learning algorithms power these predictions by processing massive patient datasets, recognizing patterns linked to disease onset. This method isn't limited to diabetes—AI is also helping predict heart attacks and strokes. Cleveland Clinic's AI-driven cardiac risk assessments have enabled earlier interventions, potentially saving countless lives.

By catching diseases before they manifest, AI-driven healthcare reduces hospital burdens, cuts costs, and improves overall patient well-being. As these systems advance, large-scale AI-powered screenings could redefine healthcare, shifting the focus from treatment to prevention.

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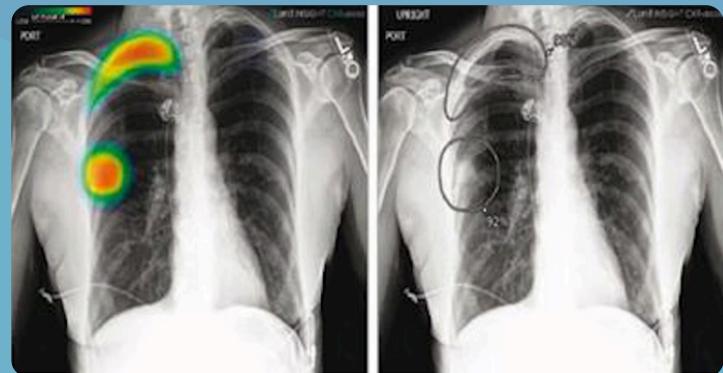


Image: <https://www.auntminnie.com/clinical-news/digital-x-ray/article/15631736/ai-improves-chest-x-ray-interpretation-in-realworld-study>

## AI in Diagnostics: The Game-Changer Doctors Needed

AI is reshaping medical diagnostics, making disease detection faster and more accurate. In India, where radiologists are scarce, AI-powered tools like Qure.ai are helping analyze X-rays and CT scans in seconds. These systems quickly detect issues like tuberculosis or brain injuries, allowing doctors to prioritize urgent cases and improve patient outcomes.

Trained on vast datasets, AI algorithms flag abnormalities such as tumors and fractures, significantly reducing diagnostic errors. In the U.S., Google Health's AI, tested in partnership with Ascension Health, has outperformed human radiologists in detecting early-stage breast cancer from mammograms, proving AI's potential in life-saving early detection.

AI isn't replacing doctors—it's supercharging them. By accelerating diagnostic workflows, AI frees up time for healthcare professionals to focus on complex cases, especially in under-resourced areas. As this technology evolves, it will redefine healthcare, making rapid, accurate diagnoses the new standard.

### Citations

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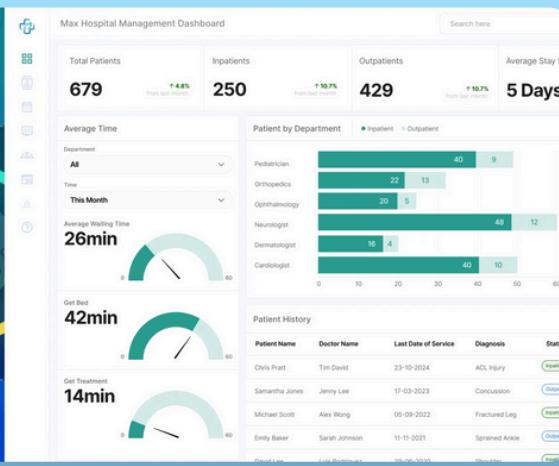


Image: <https://markovate.com/ai-in-patient-data-analysis/>

# STUDENT EXPERIENCE

## AI-DRIVEN REPAIR FOR PROCEDURALLY GENERATED GAME LEVELS



**MAHDI FARROKHIMALEKI**

Machine Learning, Procedural Content Generation (PCG), Second year Graduate Student

### Project Overview:

Mahdi's research tackles an interesting challenge in the gaming world: ensuring the stability and playability of procedurally generated game levels. While procedural content generation (PCG) techniques are widely used in games, PCG often produces game levels that are unstable or unplayable, limiting its real-world application. Mahdi is developing a repair model that uses a combination of computer vision and reinforcement learning to detect and repair unstable structures in 2D platformer levels, starting with Angry Birds.

### Data Preprocessing:

Mahdi's research involves the following data preprocessing steps crucial to ensuring the AI model can effectively repair procedurally generated game levels:

**Data Collection:** Gathering images of stable levels from procedurally generated datasets.

**Destabilization:** Removing blocks to destabilize the levels, creating examples of unstable game structures.

**Annotation:** Manually labeling unstable levels

**Feature Extraction:** Using a segmentation model to identify gaps and weaknesses, which are critical for training the reinforcement learning model

### Development Challenges:

**Generalization:** Ensuring the model works across different 2D games, not just Angry Birds.

**Repair vs. Original Design:** Preventing excessive modifications while ensuring stability.

**Dataset Availability:** Acquiring labeled unstable and stable game levels for effective training, and creating unstable levels.

### Evaluation Metrics:

**Stabilization Rate:** The percentage of originally unstable levels that become playable after repair.

**Minimal Modification Score:** The average number of blocks added per level to maintain design integrity.

**Gameplay Simulation:** Testing repaired levels in real-game environments to confirm playability.

### Tools and Frameworks

**YOLO v8n:** Used for detecting unstable structures within procedurally generated game levels through computer vision.

**Deep Q-Learning:** A reinforcement learning algorithm used to iteratively stabilize game levels by making strategic modifications.

**TensorFlow and PyTorch:** Used for model training and inference.

**Unity:** Custom game-level simulation environment used to test and validate the stability improvements.

**Pandas and NumPy:** Used for data preprocessing and analysis

### Future Directions:

Mahdi's research paves the way for more robust, AI-driven game design, enabling a future where procedurally generated content meets industry standards for stability and playability. As his research progresses, the vision is to extend this repair pipeline across a wide range of 2D games, ultimately bridging the gap between academic advancements in AI-based PCG and practical game development.