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NavTantra

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THE TECH YATRA

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From the Editor

Dear Readers,

We are excited to bring you the February edition of NavTantra INSIGHTS. The edition takes us on a journey that weaves together ancient practices with contemporary breakthroughs. With this edition, readers are able to learn about tales that stretch from the tech-fueled changes in the Maha Kumbh to the breakthrough AI innovations by NVIDIA, with narratives that inspire.

In line with our tradition, we seek to stimulate your interest and lead you to think beyond conventional boundaries. This edition will seek to persuade you to search for innovation, advancement, and the need to keep up with the latest technological innovations.

Enjoy Reading!
Kushagra Chaurasia
Editor in Chief

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MAHAKUMBH 2025 TECH YATRA?

DIGITAL MAHAKUMBH 2025

Kumbh is a Hindu carnival cum festival held every 12 years (Kumbh). After 144 years, a special Kumbh called Mahakumbh is celebrated. It's a once in a lifetime opportunity, as the last Mahakumbh was in 1881, and next shall be celebrated in 2169.
A large number of devotees are expected to arrive this year, estimated between 40 crore and 45 crore between 13 Jan and 26 February.
As of 11 February, 45 crore devotees have arrived. Shahi Snan Days: Mauni Amavasya, Basant Panchami, and MahaShivratri are expected to have 8-10 crore visitors in a day.
With such a big crowd, crowd management is a concern that is being looked over by **300 cameras and drones** with specially enabled AI software that uses computer vision and data analytics to estimate real-time crowd volume and density.
It can identify movement of people and facial expressions to identify potential threatmakers.
Over **10,000 police and paramilitary (NSG) officers** are deployed for security, many posing as common men or sadhus.
Kumbh has a reputation of separating families in the crowd. In 2000 Kumbh Mela, about 4,000–6,000 people were lost. But that was long ago. In the digital age, **personalized name tags include names and addresses.** QR Code hoardings that connect people to Google Maps to lead them to Google Maps landmarks—"meeting "points specified by Prayag Mela Authority"—prevent" such mishappenings.
Other than that, there are a lot of Glow in the Dark accessories on the market for people to buy.
AI-powered drones are being used for surveillance.
Underwater drones check underwater security and locate people who are drowning so that they can be assisted. For that purpose, there's a **Robot Life Saver** a **Remote Controlled Bouyancy bot** traveling at considerable speeds to save drowning people.
Other aspects such as fire safety are also being looked after by robotic methods that are **Robot fire fighters**, capable of climbing stairs, and precise extinguishing of fires, along with 200 fire commandos deployed.
Kumbh Sah'AI'yak is an AI chatbot developed to give information about Kumbh Mela, history, availability, travels, sites to visit, etc. for the comfort of people in 11 different languages.
However, there had been an unfortunate fire destroying 2 tents, though it resulted in no casualties.
Separate urinals over 100,000 for men and women with constant monitoring of 10,000 sanitation workers ensure that there are no sanitation problems or spread of diseases.

That's the Mahakumbh 2025, restructured digitally, completely safe with the use of AI and robotics. Hopefully you visit Mahakumbh; it's a once in a lifetime opportunity.

-Akshay Pratap Singh

CHIP MAVERIC

JENSEN HUANG

Jensen Huang: The Visionary Behind Nvidia

Jensen Huang, the CEO and co-founder of Nvidia, is a name synonymous with cutting-edge technology. His journey, from a young immigrant facing significant early life struggles to one of the most influential figures in the tech world, is a testament to his vision, innovation, and unwavering drive.

Early Life

Born in Taiwan, Huang's family experienced significant upheaval. They moved to Thailand due to political unrest and later, at the age of nine, Huang and his brother were sent to live with their uncle in the United States. This period presented numerous challenges. They were mistakenly placed in a boarding school for "troubled youth" in rural Kentucky, where they faced bullying, cultural isolation, and difficult living conditions. Huang recalled enduring constant bullying, being called ethnic slurs, and even being threatened with knives. He also described the emotional strain of separation from his parents and the challenges of adapting to a new culture. Despite these hardships, Huang excelled academically, graduating high school at 16. Education: Oregon State University: Bachelor of Science in Electrical Engineering Stanford University: Master of Science in Electrical Engineering.

Founding Nvidia and Shaping the Future:

In 1993, Huang, along with Chris Malachowsky and Curtis Priem, co-founded Nvidia. Initially focused on graphics processing units (GPUs) for gaming, Nvidia's technology has revolutionized various industries. Huang's leadership has driven groundbreaking innovations, including CUDA, a parallel computing platform that has become essential for artificial intelligence (AI) research and development.

Key Programs and Products:

GeForce GPUs: High-performance graphics cards for gaming, content creation, and more.

Quadro GPUs: Professional-grade graphics cards for industries like design, engineering, and visualization.

Tesla GPUs: Data Center GPUs for Al, high-performance computing (HPC), and machine learning.

Jetson Platform: Embedded and edge Al computing platforms for robotics, autonomous machines, and AloT.

NVIDIA Al Platform: A comprehensive suite of software, tools, and services for Al development and deployment.

CUDA: A parallel computing platform and programming model that enables developers to harness the power of GPUs for general-purpose computing.

Impact on Gaming and Beyond:

Nvidia's GPUs have transformed the gaming landscape, powering stunning visuals and immersive experiences. Beyond gaming, Nvidia's technology is at the forefront of Al, powering breakthroughs in fields like self-driving cars, medical imaging, and scientific research.

A Leader in Innovation:

Huang's visionary leadership has positioned Nvidia as a dominant force in the tech industry. His focus on long-term innovation and a strong company culture has fueled Nvidia's success.

Net Worth:

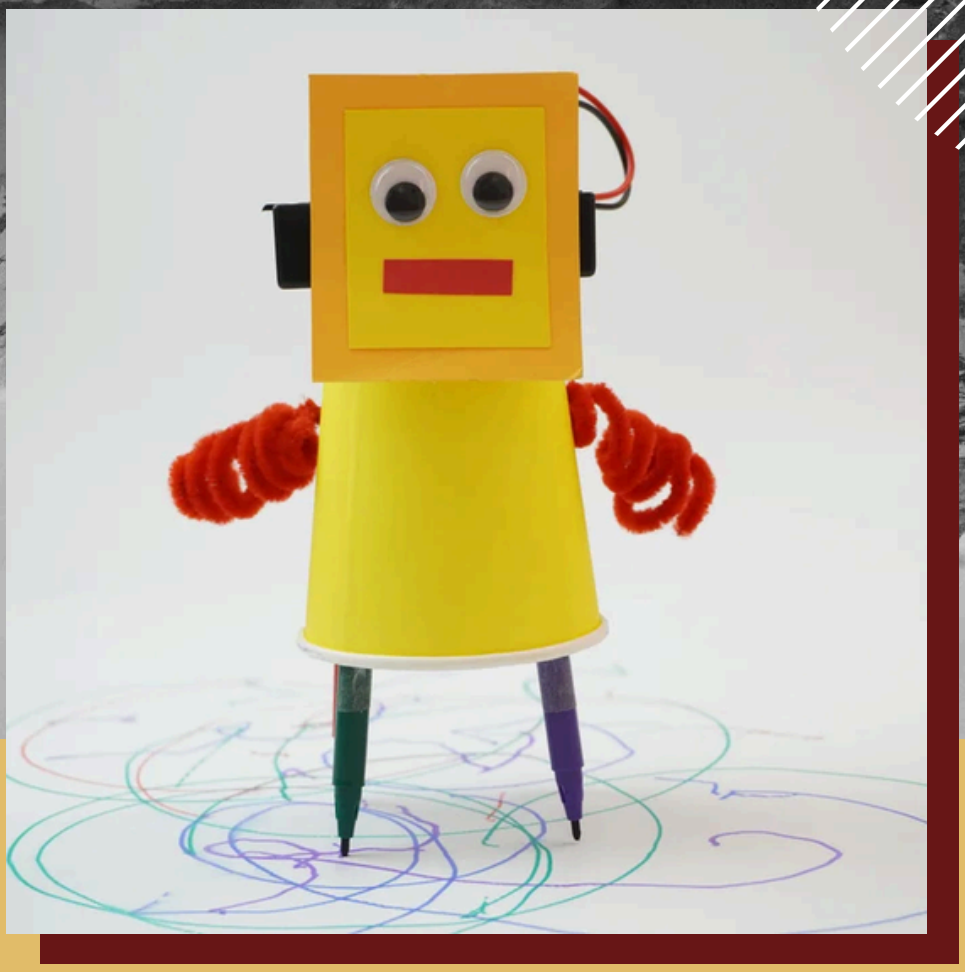
According to Forbes, Jensen Huang's estimated net worth is around $15 billion.

Looking Ahead:

As technology continues to evolve, Nvidia, under Huang's guidance, is poised to play a crucial role in shaping the future. From the metaverse to robotics, Nvidia's innovations have the potential to transform how we live, work, and interact with the world.

- Samman Verma

DIY Scribble BOT



A SCRIBBLE BOT IS A SIMPLE DIY ROBOT THAT USES VIBRATION TO MOVE AND CREATE RANDOM SCRIBBLES ON PAPER. IT'S A FUN PROJECT FOR KIDS, COMBINING BASIC ELECTRONICS WITH CREATIVITY, AS THE BOT MOVES AROUND AND DRAWS WHILE EXPLORING THE CONCEPT OF MOTION AND VIBRATION.

Materials:

- Small DC motor (like the ones used in bristlebots){Vibration motors}
- Battery pack (with AA batteries or coin cell)
- Markers (2 or 3, with the lids removed, acting as the legs)
- Plastic/Paper cup or small container (as the base)
- Googly Eyes for design(Optional)
- Double-sided tape or glue
- Electrical tape (for connecting wires)
- Wires (to connect the motor to the battery pack)
- Paper or cardboard (for the bot to scribble on)

How to Make a Scribble Bot:

1. Prepare the Body

Grab a small plastic cup (or any lightweight container) that will serve as the body of your bot. It's like choosing an outfit for your bot, so make it cute and easy to work with. A plastic bottle or even an old yogurt container could work perfectly!

2. Attach the Motor

Time to give your bot some movement! Stick a small DC motor to the bottom of your cup using double-sided tape or some glue. Make sure the motor's shaft is free to spin - no one likes a stuck motor! This is the heart of your bot, making it vibrate and move like it's alive.

3. Add the Markers

Here's where things get artsy! Place a couple of markers (with their caps off!) underneath the bot so they act as its "legs." You can tape them down to make sure they stay in place, but the key is to have the markers in contact with the paper so they leave behind a lovely scribble trail as the bot moves.

4. Connect the Wires

Now, hook up the wires from the motor to a battery pack. If you have a battery pack with a switch, perfect - just flick the switch to power up the motor! When the motor hums to life, your Scribble Bot will start shaking and creating those random scribbles on the paper. It's like watching it dance!

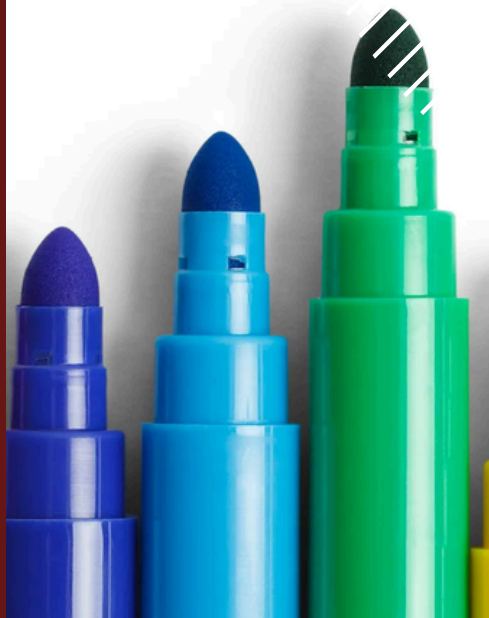
5. Let It Scribble

Now that everything's in place, power it on and watch your bot go wild. It's going to vibrate and move in unpredictable ways, leaving fun, chaotic scribbles behind. It's like a little artist with a mind of its own!

How it Works?

The Scribble Bot works through vibration caused by the motor. When the motor turns on, it creates a small shaking motion that pushes the bot in different directions. Because the markers are positioned under the bot, they touch the surface as it moves, making lines on the paper. The randomness of the bot's movement creates abstract, spontaneous drawings as it "scribbles." The vibration concept behind the Scribble Bot can be linked to simple mechanical principles. As the motor rotates, the unbalanced nature of the setup causes the bot to vibrate and move in different directions. This is similar to how a vibrating cell phone works—using motion to create an effect.

- Atharv Agrawal



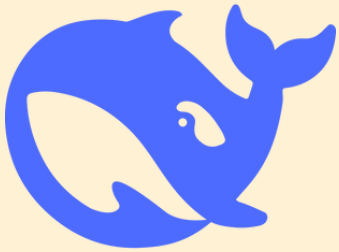
The Chinese AI Uprising

THE DEEPSEEK

KEY POINTS

- **NVIDIA LOSES AROUND 600 BILLION DOLLORS IN ONE DAY AFTER RELEASE**

DEEPSEEK



1. Founding and Early Research (2023):

- Founding Team: Liang Wenfeng, the Chinese entrepreneur behind DeepSeek, the AI App challenging ChatGPT.
- Mission: To build models that excel in specialized tasks like mathematics and coding while remaining efficient and accessible.
- Initial Focus: The team began by optimizing transformer architectures for computational efficiency and accuracy in STEM tasks.

2. Breakthroughs:

DeepSeek, a Chinese AI startup founded in 2023, has quickly made waves in the tech world. Their latest model, DeepSeek-V3, a 671-billion-parameter AI, was trained in just 55 days for $5.58 million—competing with GPT-4o and Claude 3.5 Sonnet at a fraction of the cost. Their AI Assistant for document vision also topped the U.S. iOS App Store.

DeepSeek's rise has impacted industry giants like Nvidia, whose stock dipped slightly amid growing competition. However, regulatory scrutiny is mounting, with the EDPB monitoring its practices and Italy blocking its chatbot over data concerns.

Despite challenges, DeepSeek is gaining recognition, with Google's CEO Sundar Pichai praising its work. The company's rapid expansion is reshaping the AI landscape, fueling competition, regulatory debates, and China's influence in global tech.

3. Code Generation Excellence:

DeepSeek AI has launched DeepSeek-Coder-V2, an open-source Mixture-of-Experts (MoE) code model that builds on DeepSeek-V2 with an additional 6 trillion tokens of pre-training. Supporting 338 programming languages and a 128K token context, it enhances coding and mathematical reasoning.

Benchmark results show it surpasses several closed-source models, including GPT-4 Turbo, with a Pass@1 score of 74.2 in LiveCodeBench and 89.6 in MATH. Its efficient architecture activates only relevant parameters, optimizing performance for coding, debugging, and calculations.

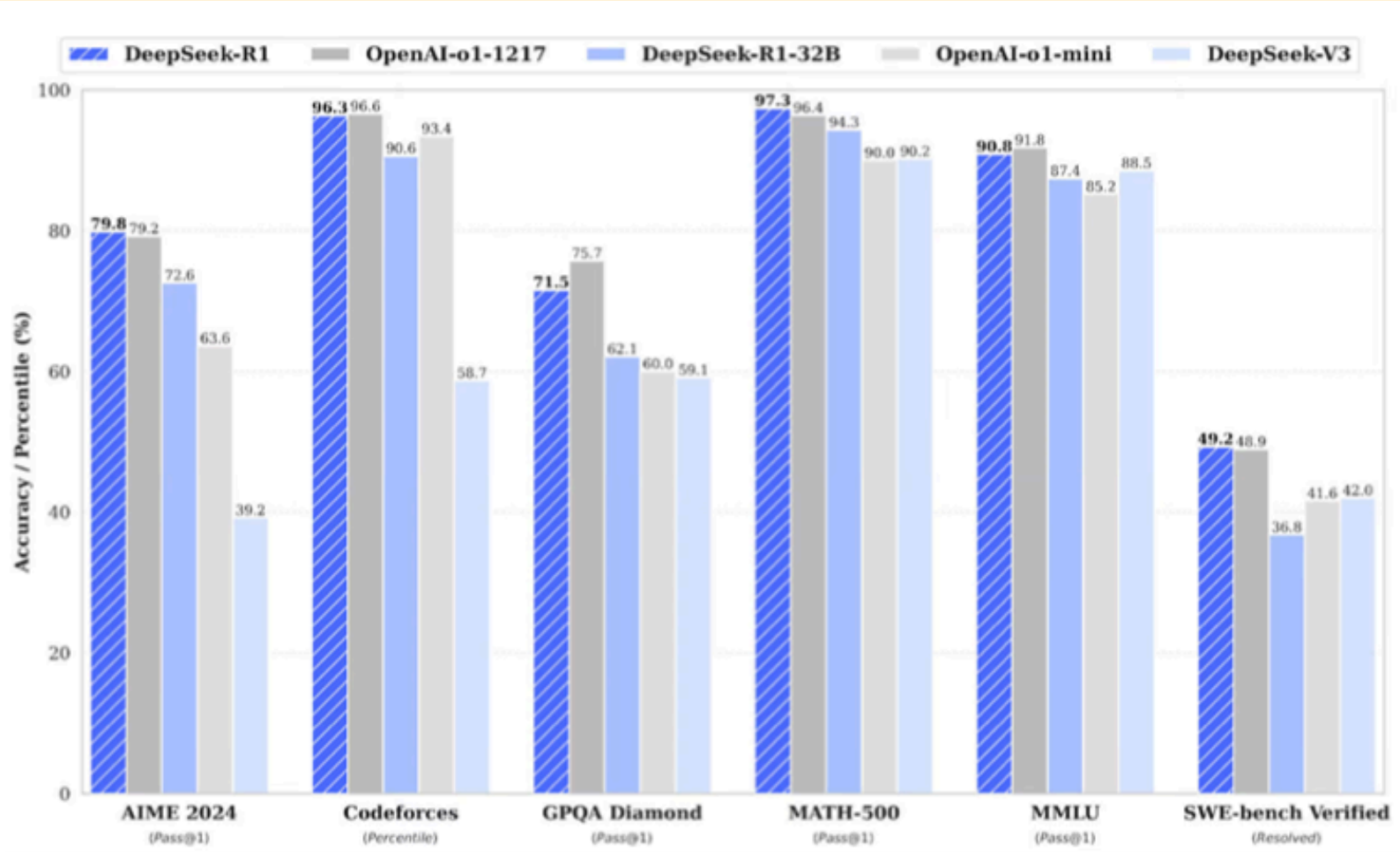
Available in two versions (16B and 236B parameters) under an MIT license, DeepSeek-Coder-V2 can be accessed via Hugging Face or DeepSeek's API, reinforcing the impact of open-source models in AI-driven code intelligence.

4.Open Source Release:

- Transparency: DeepSeek released multiple models under Apache 2.0 and MIT licenses, including DeepSeek-Coder-33B and DeepSeek-Math-7B, on platforms like Hugging Face and GitHub.
- Community Adoption: Over 30,000 GitHub stars and widespread adoption by developers for tasks ranging from data analysis to automated coding.

5. Summary:

1. DeepSeek-R1 (blue hatched bars) and OpenAI-o1-1217 (gray bars) lead in most tasks, often achieving close or competitive scores.
2. DeepSeek-R1 outperforms OpenAI-o1-1217 in MATH-500 (97.3% vs. 96.4%) and GPQA Diamond (71.5% vs. 75.7%).
3. OpenAI-o1-1217 slightly outperforms DeepSeek-R1 in Codeforces (96.6% vs. 96.3%) and MMLU (91.8% vs. 90.8%).
4. SWE-bench Verified shows the lowest accuracy across all models, with DeepSeek-R1 scoring 49.2%, slightly higher than OpenAI-o1-1217 (48.9%).
5. DeepSeek-R1-32B and OpenAI-o1-mini (lighter bars) show lower performance across multiple benchmarks.



-Ishan Jaiswal

TANTRA CURRENTS

The manufacturing industry in 2025 will change significantly, driven by five key robotics trends. Artificial Intelligence (AI) and Machine Learning will play a major role in improving efficiency by predicting maintenance needs and analyzing data in real time. These technologies will help manufacturers make smarter decisions and find better ways to optimize processes.

Industrial Robots, Cobots, Digital Twin Technology, and Humanoid Robots will work together to create flexible and automated production systems. This combination will boost productivity, allow quicker responses to market changes, cut costs, and improve the quality of products.

The integration of AI, robotics, and the Internet of Things (IoT) will lead to the rise of smart factories. In these factories, machines and systems will communicate seamlessly to optimize production processes in real time. This will result in higher efficiency, less downtime, and more customized products. Digital Twin Technology will also help manufacturers by creating virtual models of production lines for testing, predicting maintenance needs, and planning better.

Humanoid Robots will become more important in the future. They will work with humans on tasks that need precision, flexibility, and problem-solving skills. By using these robots, manufacturers can improve productivity, enhance product quality, and reduce workplace accidents.

In summary, manufacturing in 2025 will be shaped by advancements in AI, robotics, and IoT. These technologies will create smarter, more adaptable, and automated systems, leading to greater innovation and efficiency.

- Siddhima Chaubey

“Innovation is the whisper of tomorrow heard in the echoes of today.”