

Viewing Ajay Prabhakar's app...

Layout

AI and ML in the Navy | Mapping a path together

Perspectives on Applied AI and its relevance for the Navy

Dr. Ajay Prabhakar

Award winning Researcher, Consultant United Nations, Former United Nations Officer, Author, Educationist and Historian



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Why prioritize AI and accelerate adoption in the Navy?

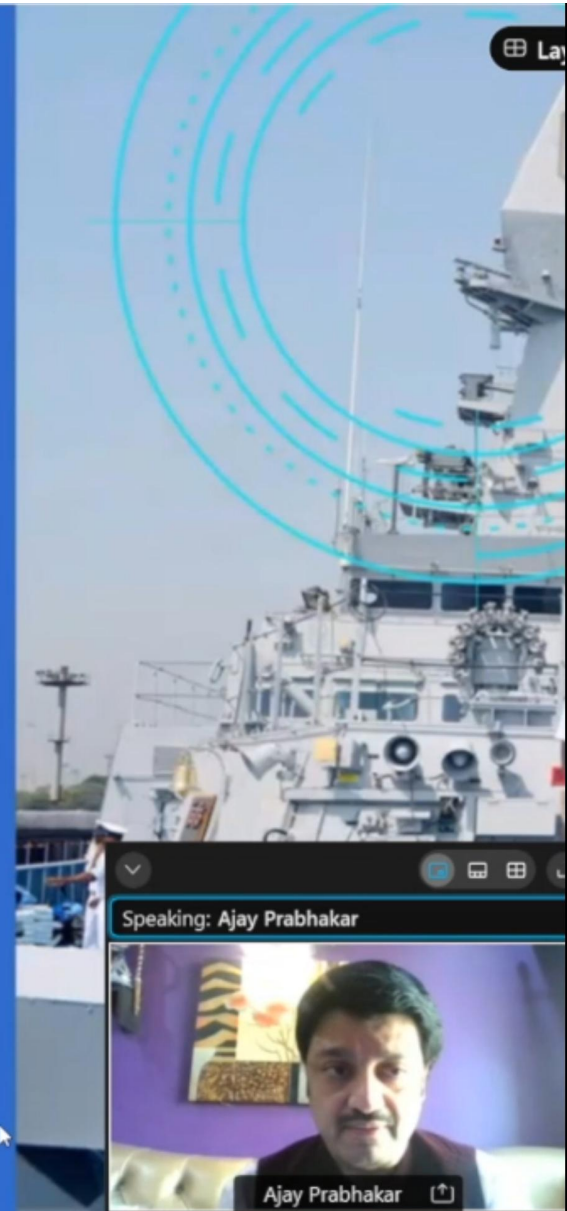
Voices from the world

China

- On July 20, 2017, the Chinese government - released a strategy detailing its plan to take the lead in AI by 2030.
- China is already investing worth over 150 billion RMB¹⁴²—or approximately \$21.7 billion—by 2020 and will “firmly seize the strategic initiative” and reach “world leading levels” of AI investment by 2030.
- In 2015, China's leading AI company, Baidu, created AI software capable of surpassing human levels of language recognition, almost a year in advance of Microsoft.

USA

- The U.S. National Defense Strategy, released in January 2018, the U.S. military is already integrating AI systems into combat via a spearhead initiative called Project Maven, which has used AI algorithms to identify insurgent targets in Iraq and Syria.



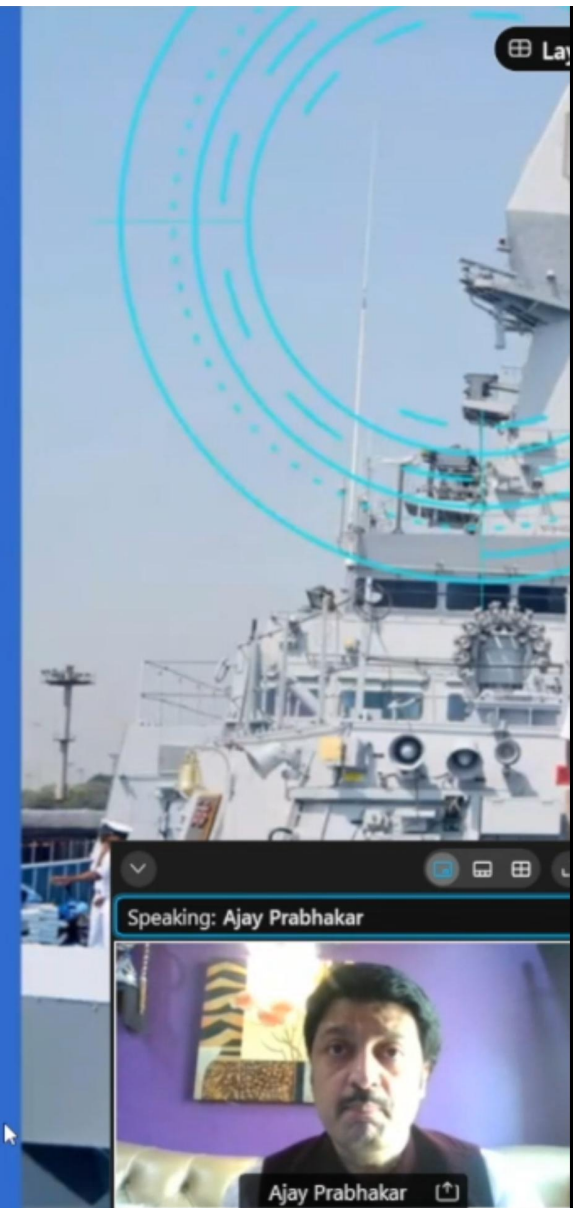
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Voices from the world

Russia

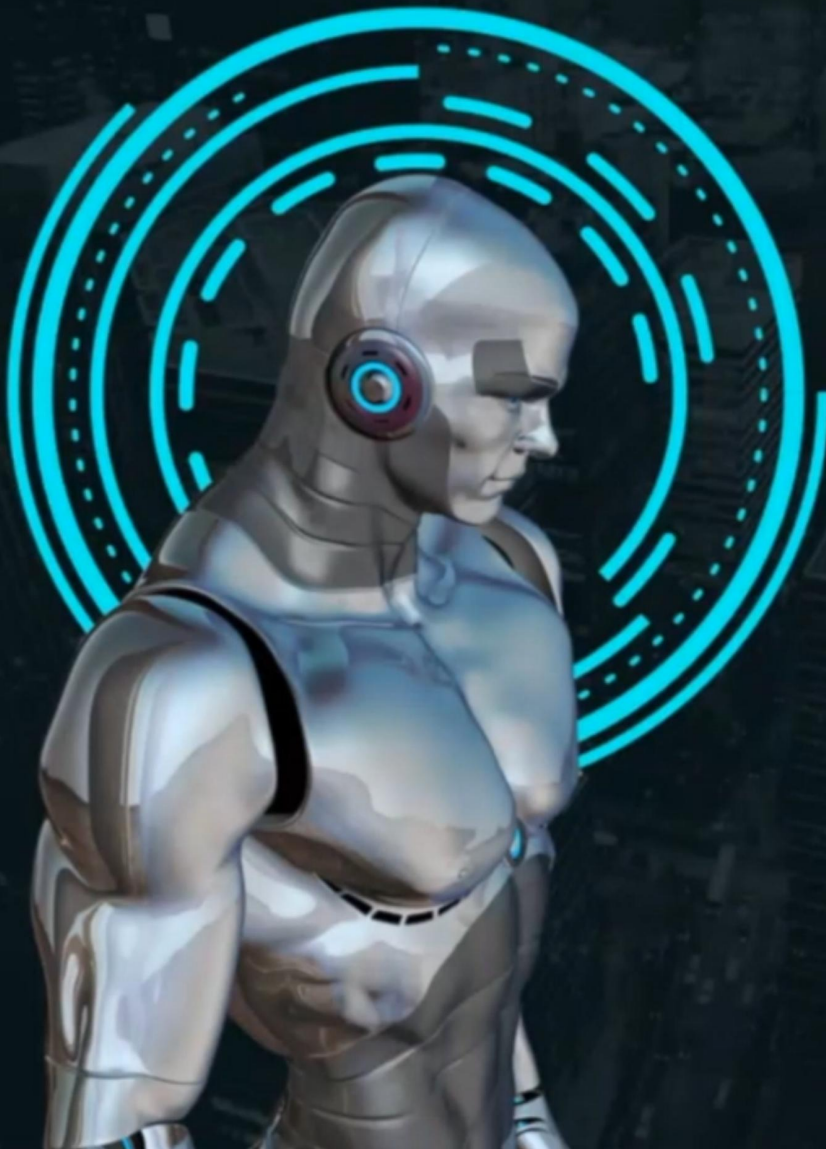
- Less than two months later Vladimir Putin publicly announced Russia's intent to pursue AI technologies, stating, "[W]hoever becomes the leader in this field will rule the world." .
- In March 2018, the Russian government released a 10-point AI agenda, which calls for the establishment of an AI and Big Data consortium, a Fund for Analytical Algorithms and Programs, a state-backed AI training and education program, a dedicated AI lab, and a National Center for Artificial Intelligence, among other initiatives.
- Belfer Center Study on Artificial Intelligence and National Security asserted: AI technology is likely to be a transformative military technology, on a par with the invention of aircraft and nuclear weapons... Though machine learning and AI technology are comparatively young, human and organizational responses to the new technology are often echoes of prior experiences



Let us



- Respect privacy, diversity and opinions of others.
- Communicate well and base disagreements on scholarly ideas or research evidence.
- Use proper language, be explanatory and justify opinions.
- Treat people as if you were in a face-to-face situation with them.
- Avoid using sarcasm, being rude capital letters.



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Amazing world of AI

- Organizations such as ridesharing company Uber Technologies use dynamic pricing—accurately pricing a commodity or service between supply and demand.
- On Boeing 777s, pilots only spend about seven minutes out of every flight manually flying the plane, while Airbus pilots manually fly about three and a half minutes of every flight
- IBM's Deep Blue and Watson projects are both advanced versions of narrow AI that have received much attention over the past years (medicine and chess) .



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Amazing world of AI

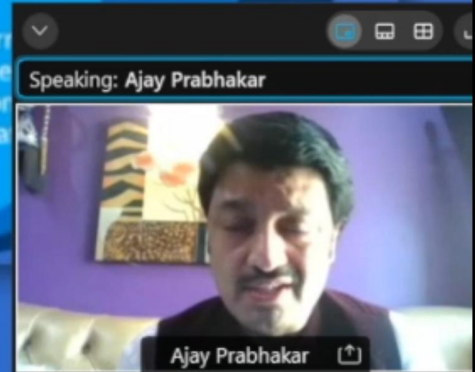
- Amazon's Alexa and Apple's Siri are both examples of narrow AI beginning to make regular, continuous changes to people's lives.
- Amazon's machine learning systems are being used to recommend products to customers on its e-commerce platform. AI help's it determine which deals to offer and when, and influences many aspects of the business.
- Notifications from banks when you do a transaction from a new device? This is a case of AI being used to detect any potential fraud.



What is AI

Let us start

- The term “artificial intelligence” actually goes back many decades, dating back to the year 1956 when John McCarthy first coined the term.
- An artificial system developed in computer software, physical hardware, or other context that requires human-like perception, cognition, planning, learning, communication, or physical action.
- AI requires algorithms which are able to learn from experience. This is where Machine Learning [ML] comes into the picture.



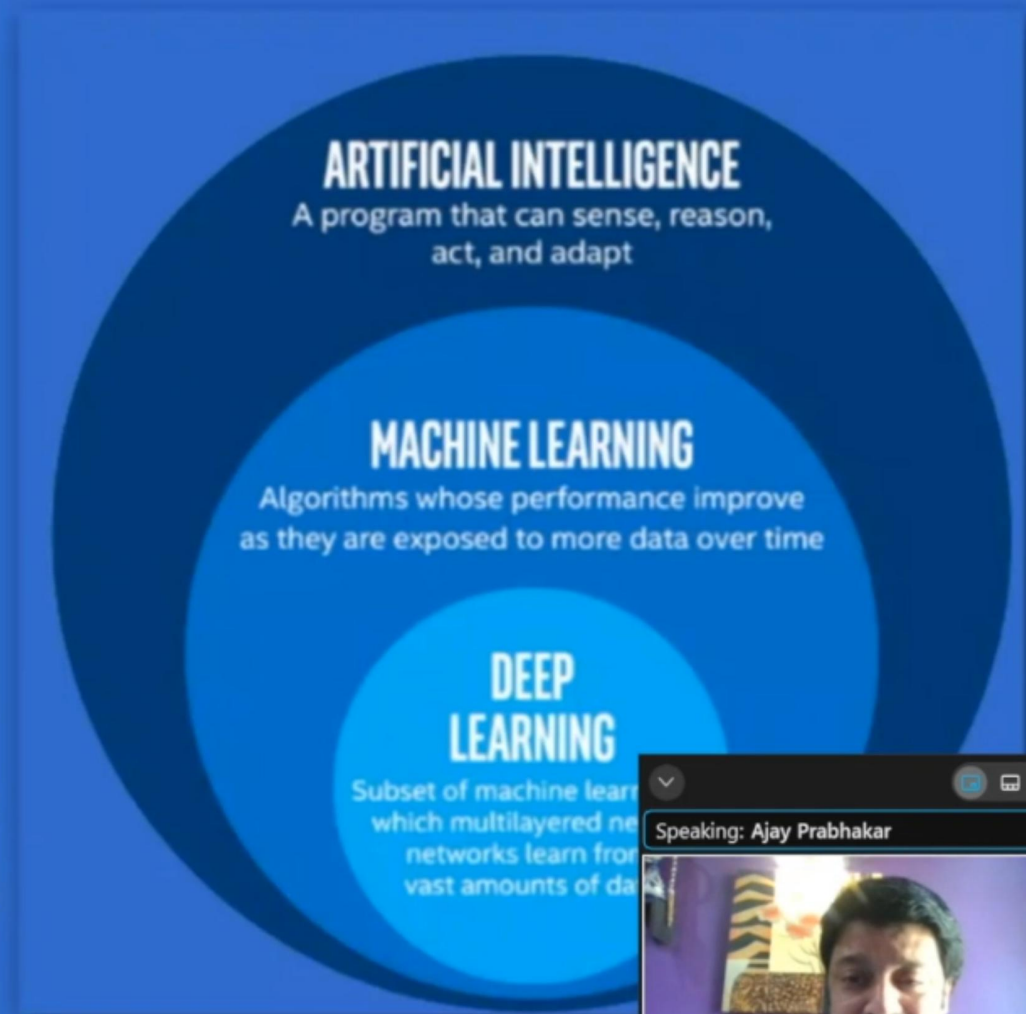
The How to Learn of AI (ML)

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Let us start

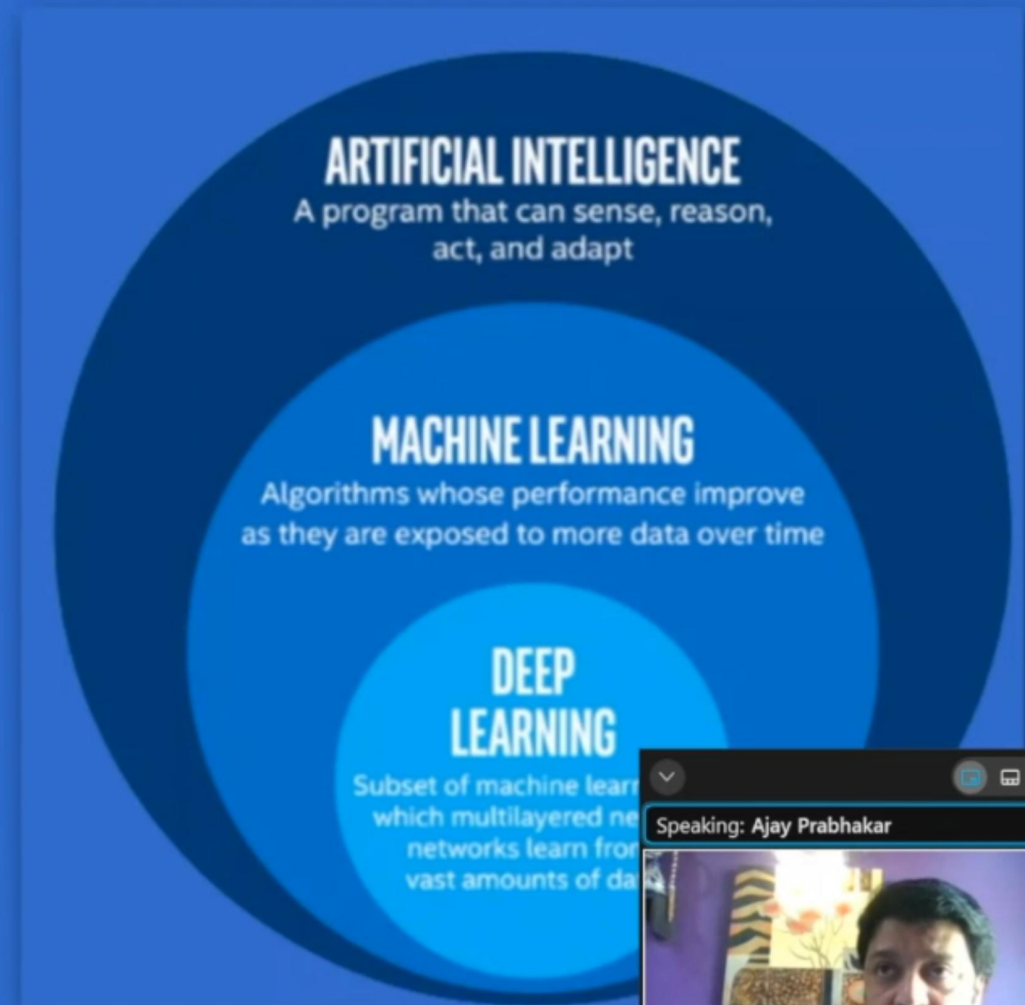
- **Machine Learning** is the development of computer programs that can do tasks without instruction.
- It is different to traditional computer software in that a human developer hasn't written code that instructs the system what to do.
- ML is used for credit card fraud detection, self-driving cars and face detection and recognition. It uses complex algorithms that constantly go back and forth over large data sets, analysing patterns in the data and then instructing other machines to respond to situations for which they have not been explicitly programmed.



The Basic Unit of AI

Let us start

- **Artificial Neural networks** are sets of algorithms, modelled loosely after the human brain, that is designed to recognize patterns.
- They interpret sensory data through a kind of machine perception.
- The patterns they recognize are numerical, contained in vectors, into which all real-world data, be it images, sound, text or time series, must be translated. Neural networks help us cluster and classify data.
- **Deep Learning** is a type of machine learning where artificial neural networks learn from large amounts of data. They do this by themselves once the algorithms and neural networks are set up.



Scope of work | Education

(Pioneers Nation and Transform LMS)

Domains | Content Creation and Education

Instead of preparing students for careers , we at Pioneers Nation, are inverting the educational pyramid, use careers(Medicine, Architecture, Robotics etc.) to give students a first hand feel of what skills are required for each domain.

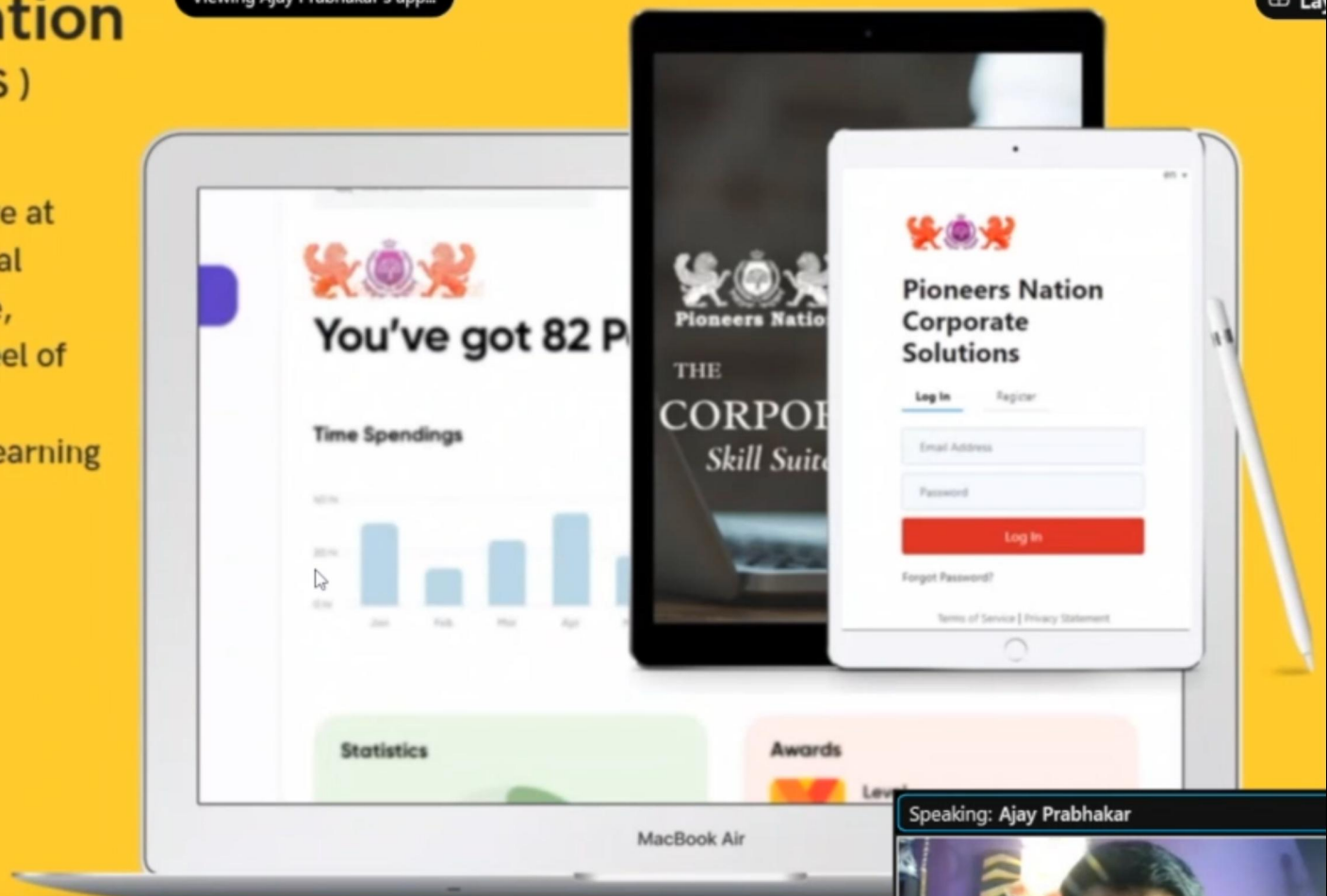
Skill based approach to learning using our Learning Platform **Transform**.

Using AI (various forms) to

- Better Learning Interfaces
- Better Quality of Content
- Content Delivery
- Improving Learning Levels
- Learning Interventions
- Evaluation assessment
- Resource recommendation
- Career paths (Strengths and areas of improvement)

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Speaking: Ajay Prabhakar



Fun AI Fact

While the human brain has over one hundred billion neurons, the most advanced AI available today only has about one billion neuron equivalents.



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Speaking: Ajay Prabhakar



Do you feel AI is a bubble?

Like in 1974-1980, a period known as "AI winter", when several criticised progress in the field and all government and private funding froze.

Talking Points

Please, Listen respectfully and actively
Commit to learning, not debating
Criticize ideas, not individuals
Avoid blame, speculation, inflammatory language
Avoid assumptions about others
Please refrain from talking over each other.

Speaking: Lt Cdr Vinayak Nambiar



Ajay Prabhakar

Scope of work | Research

(Luminate)

Domain | Linguistics

Linguistics is the study of language and its use. Artificial intelligence (AI) offers some new perspectives on language learning by looking at what is "natural" for humans to learn given the circumstances.

From early 1990's our center has been studying the Ikom monoliths and the various different sites including Saharan caves and archaeological sites in Niger, studying signs and symbols in these sites.

Using AI (various forms) to

- Better quality of data
- "Comparing and reading" images
- Decrypt Language
- Classification
- Virtual Mapping of Artifacts to cultures and spaces
- Sensitization

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	3100 BC	3000 BC	2400 BC	1000 BC
head				
mouth/speak				
water				
heaven/god				
earth/land				

Speaking: Ajay Prabhakar

Ajay Prabhakar

Fun AI Fact

The IBM Watson required 85,000 watts of power. The human brain, by contrast, runs on the equivalent of 20 watts.



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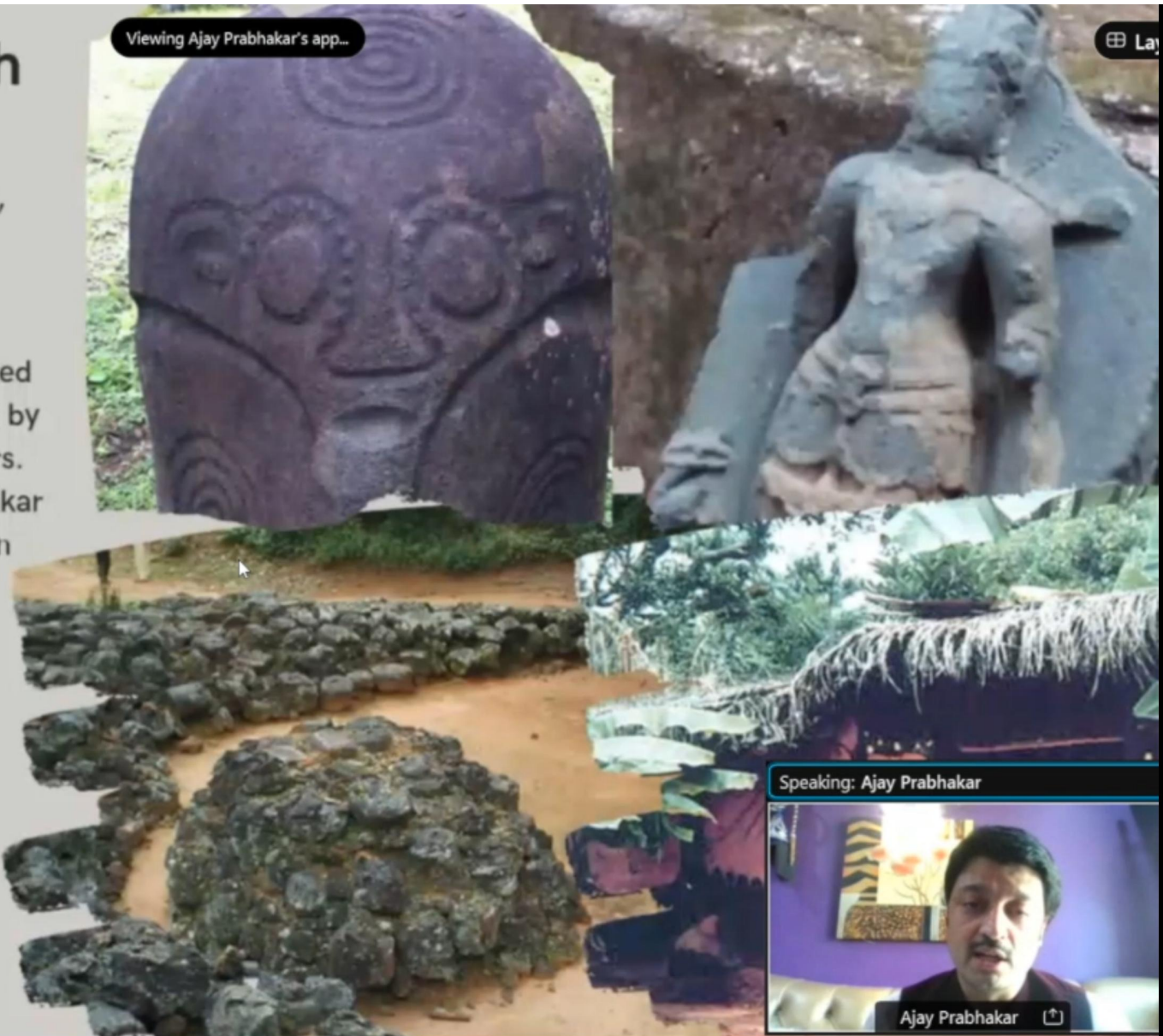
Speaking: Ajay Prabhakar



Scope of work | Research (Luminate)

Domains | Archives, Archaeology

- Luminate is a centre dedicated to the research, protection and expression of the tangible and intangible cultural heritage of the world.
- The Ikom monoliths, (over 300 of them) are carved stones with enigmatic inscriptions located in the villages of Ikom and environs left behind by ancient Africans dating back thousands of years.
- The Luminate team headed by Dr. Ajay Prabhakar has been studying and enlisted the monoliths in the World Monument Fund 2008 Watch List
- Using AI (various forms) to
 - Preservation Culture and Heritage
 - Preservation and Restoration of Artifacts
 - Processing & Cataloguing
 - Virtual Mapping of Artifacts
 - Indexing and Classification
 - Outreach and Sensitization



Challenges with AI in our projects

Implementation of a project is one aspect but constant monitoring so that it accomplishes the results that we want it to achieve is paramount.



Data Cleaning



Quality of Data Sets



Right Data



Audit and AI Bias

