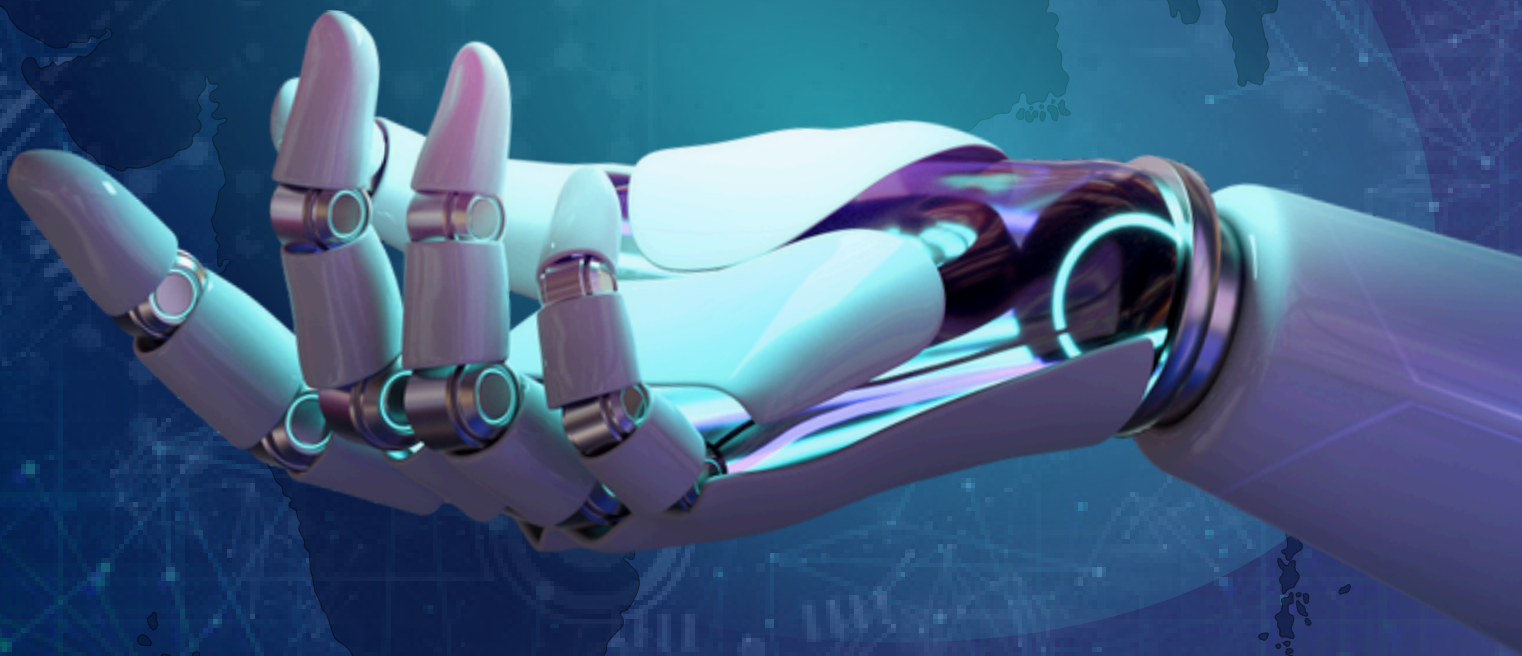




**STRATEGIC
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Artificial Intelligence Ecosystem in India



**COMPREHENSIVE REPORT BY STRATEGIC POLICY LAB
PART 2; Ministries, Committees & State Governments**



MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

AI COMMITTEES

On 07 February, 2018, to assess the possible impact of AI on the economy and society and to come out with policy framework on AI in India, MeitY constituted four (4) Committees which are (i) Committee on Platforms and Data for AI, (ii) Committee on Leveraging AI for Identifying National Missions in Key Sectors, (iii) Committee on Mapping Technological Capabilities, Key Policy Enablers, Skilling, Re-Skilling and R&D and (iv) Committee on Cybersecurity, Safety, Legal and Ethical Issues.[1] The committees released their reports in July, 2019.[2] The Reports of the AI Committees lay down the foundation for the AI policy framework and implementation strategies in India. The recommendations of each committee as as follows:

[1] <https://pib.gov.in/PressReleasePage.aspx?PRID=1540049>

[2] <https://www.meity.gov.in/artificial-intelligence-committees-reports>

Committee on Platforms and
Data for AI

Committee on Cybersecurity,
Safety, Legal and Ethical
Issues

Committee on Mapping
Technological Capabilities,
Key Policy Enablers, Skilling,
Re-Skilling and R&D

Committee on Leveraging AI
for Identifying National
Missions in Key Sectors



MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

Committee on Leveraging AI for Identifying National Missions in Key Sectors

Inspire a large number of students in engineering colleges to work on technical problems in AI that are strongly related to national missions by posing grand challenges surrounding AI. [1] The Committee further suggested identifying concerns in the Indian context that are amenable to being resolved by AI by segregating these based on a possible time frame for resolving these; short term, medium- and long-term projects with a resolution deadline of 2 years, 7 years and 12 years, respectively. A list of 20 sectors were identified. These are referred to as Missions and include agriculture, food, health, water resources, education, culture, technology designed to facilitate the specially-abled, transportation, highways and waterways, railways, energy, habitat, public safety, disaster management, legal, and finance. Also, the committee has proposed changes to the methodology involved in the resolving of the problems—in addition to the standard, request for proposal (RFP) methodology, followed hitherto, the committee suggested that the problem be thrown open to the umpteen candidates that have enrolled themselves in engineering colleges in India. The feature on AI for the specially-abled, at least as an intent, is among the first steps that would impart the Human-centric character to Indian AI.²⁴

[1] https://www.meity.gov.in/writereaddata/files/Committees_B-Report-on-Key-Sector.pdf



MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

Committee on Mapping Technological Capabilities, Key Policy Enablers, Skilling, Re-Skilling and R&D

(Enable use of AI by supportive policies and regulations, remove bottlenecks from legacy regulations, enabling collaboration and making public data available for AI with clear and transparent control.)

While the Committee talks of potential benefits of AI deployment in India, in a broader sense, it begins with conceding the fact that the talk on machines taking over from humans, in the past couple of decades has not been realized and unlikely to be realized in the future, as well. In a way, it sets a realistic picture of what's achievable in the near and distant future and so sets out to define the future scope of work for the Indian AI industry.[1] By and large the AI Committee Report focuses on enabling policies such as work (discussion papers) on the National AI Strategy Policy document to define a roadmap for India. The focus of this report is on policy making that enables setting up of a strong R&D base, facilitates a cross functional team of technologists, provides the right ecosystem for entrepreneurs to flourish, and imparts the skills to create an efficient AI workforce. Further, the creation of an institutional mechanism aimed at governance of AI in India and consisting of a National AI Council in conjunction with its secretariat, is in the offing.



MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

Committee on Mapping Technological Capabilities, Key Policy Enablers, Skilling, Re-Skilling and R&D

Whereas the aforementioned framework is expected to set the ball rolling, the talk on data is restricted to digitization and procurement of wide-ranging data, in the sense of data from as many sectors as possible. There is no mention of broad-based data to purge it of its biases. In the Indian context, there's much to do, since the society is itself riddled with structural inequities, which will invariably mirror in the data collected, a separate committee with accomplished sociologists on board, may perhaps win the day for Indian AI.[2]

[1] https://www.meity.gov.in/writereaddata/files/Committees_C-Report-on_RnD.pdf

[2] <https://royalsocietypublishing.org/doi/10.1098/rsta.2018.0087>

AI Capability Maturity Model

Organizational Maturity
Capacity to Execute and Manage
AI Initiatives.

Levels

- OPTIMIZED **5** ENTERPRISE
- MANAGED **4** PORTFOLIO
- DEFINED **3** PROGRAM
- REPEATABLE **2** TEAM PROJECT
- AD HOC **1** INDIVIDUAL PROJECT





MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

Committee on Platforms and Data for AI

Setting up of National AI Platform (NAIRP) which would function as an Open Data and Knowledge-cum-Innovation Platform that will enable usage by all categories of users for socio-economic good by encouraging the highest quality talent and innovators from all over the country and world to participate in this programme and help solve national challenges.[1]

[1] https://www.meity.gov.in/writereaddata/files/Committees_A-Report_on_Platforms.pdf

Committee on Cybersecurity, Safety, Legal and Ethical Issues

A sectoral approach is to be taken for regulating AI as it would allow for greater flexibility, more effective implementation and targeted approaches that could better govern unique sectors than a general law.[1]

[1] https://www.meity.gov.in/writereaddata/files/Committees_D-Cyber-n-Legal-and-Ethical.pdf

Responsibility

Safety

Transparency

Biases & Fairness





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National AI Portal

The National AI Portal of India is a joint initiative of MeitY, National eGovernance Division (“NeGD”) and National Association of Software and Service Companies (“NASSCOM”). [1] The portal aims to be the trusted content powerhouse and central knowledge repository for AI for India for key beneficiaries including aspiring entrepreneurs, students, professionals, academics, and everyone else.[2]

[1] <https://indiaai.gov.in/about-us>

[2] <https://www.psrindia.com/Upload/Resource/Newsletter/Document/Artificial%20Intelligence%20in%20Electricity%20Distribution%20Sector%20of%20India20211201165837748.pdf>

Future Skills Prime

MeitY in collaboration with NASSCOM has initiated a business to customer (“B2C”) framework for re-skilling and/or up-skilling IT and non IT professionals in the emerging technology including AI. So far, 7 Lakh (7,00,000) candidates have signed-up on the FutureSkills PRIME Portal, out of which, 1.2 lakh (1,20,000) candidates have completed their courses. Under AI, 36,528 candidates are enrolled in deep- skilling courses and 47,744 candidates are enrolled in Foundation courses.[1] This initiative of MeitY has resulted in a large number of youth signing up for AI courses, resulting in the increase of AI literacy across the country.

[1] <https://pib.gov.in/PressReleasePage.aspx?PRID=1811372>



MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

Natural Languages Translation Mission

Natural Languages Translation Mission (“NLTM”) is one of the most anticipated initiative that is to be lead by MeitY along with the Ministry of Education (“MoE”) and DST.[1] NLTM is aimed at the formation of an inclusive knowledge society via machine-aided translation between English and Indian languages. MeitY is said to be soon placing a proposal of Rs. 450 crore before the Union Cabinet for NLTM.[2] It is also reported that the Central Government is set to fund 100 startups to use its AI powered language platforms.[3] The NLTM would enable the outreach of AI into the deep-roots of Indian society irrespective of the literacy in English language and would further strengthen the multi-lingual, multi-cultural heritage of the country.

[1]<https://www.psa.gov.in/mission/natural-language-translation/33>

[2]<https://indiaai.gov.in/missions/national-mission-on-natural-language-translation>

[3]<https://indiaai.gov.in/missions/national-mission-on-natural-language-translation>

NATIONAL LANGUAGE TRANSLATION MISSION

“We will undertake a new initiative – National Language Translation Mission (NLTM). This will enable the wealth of governance-and-policy related knowledge on the Internet being made available in major Indian languages.”





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DEFENCE RESEARCH AND DEVELOPMENT ORGANIZATION

Centre for Artificial Intelligence

Established in 1986, the Centre for Artificial Intelligence and Robotics ("CAIR") is located in Bangalore, Karnataka and is involved in the Research & Development of high quality Secure Communication, Command and Control, and Intelligent Systems. An important project developed by CAIR is Networking Traffic Analysis ("NETRA"). Whatever little information is available through public domain, it is clear that NETRA is a surveillance system designed specifically to monitor the nation's internet networks including voice traffic passing through software such as Skype or Google Talk, besides write-ups in tweets, status updates, emails, instant messaging transcripts, internet calls, blogs and forums. Not much is known regarding how this is proposed to be done, what technology will be employed, under what authority it will operate or what procedural safeguards are in place to prevent misuse of intercepted data. NETRA being strictly an Internet surveillance system, it should operate under the provisions Sections 69 and 69B of the Information Technology, Act 2000 read with the Information Technology (Procedure and Safeguards for Interception, Monitoring and Decryption of Information) Rules, 2009 and the Information Technology (Procedure and Safeguards for Monitoring and Collecting Traffic Data and Information) Rules, 2009 since the collectively prescribe the legal framework for interception of internet traffic and meta-data respectively.



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DEFENCE RESEARCH AND DEVELOPMENT ORGANIZATION

Centre for Artificial Intelligence

However, said legislations contain no provisions that allow the conduct of perpetual mass surveillance, which is exactly what NETRA seemingly does. So the question of how NETRA operates in conformance with governing laws as they stand today remains unanswered and open to speculation.



Centre for Artificial Intelligence & Robotics



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MINISTRY OF CIVIL AVIATION

No Permission, No Take-Off

There has been an increase in the use of AI in drones. On 27 August, 2018, the Ministry of Civil Aviation (“MoCA”) issued No Permission, No Take-Off (“NPNT”).[1] According to NPNT, drones will not be able to operate without taking permission from the Directorate General of Civil Aviation (“DGCA”). However, only drones operating outside the green zone and more than 250 grams will require mandatory permission from DGCA. [2] On 27 May, 2021, the MoCA granted permission of “No-Permission-No-Takeoff’ (NPNT) compliant drone operations at 166 green zones in addition to the already present 66 green zones (a total of 232 green zones), to facilitate, smoothen, and promote drone operations in the country.[3] This enabling environment boosts the development of AI solutions that utilize drones for automating various business processes.[4]

[1] <https://pib.gov.in/newsite/printrelease.aspx?relid=183093>

[2] <https://pib.gov.in/PressReleasePage.aspx?PRID=1554408>

[3] https://www.civilaviation.gov.in/sites/default/files/MoCA-order-166-green-zone-sites_27-May-2021.pdf

[4] <https://www.psrindia.com/Upload/Resource/Newsletter/Document/Artificial%20Intelligence%20in%20Electricity%20Distribution%20Sector%20of%20India20211201165837748.pdf>





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DEPARTMENT OF SCIENCE AND TECHNOLOGY

Consolidation of University Research for Innovation & Excellence in Women Universities AI Facility

Consolidation of University Research for Innovation & Excellence in Women Universities AI Facility ("CURIE-AI Facility") is an initiative of the DST which aims to set up Artificial Intelligence labs at women universities to empower women in the field of Artificial Intelligence.[1] The aim of CURIE-AI Facility is to foster AI innovations and set up AI-friendly infrastructure to prepare skilled women for AI-based jobs and to expose women students to different AI tools and to improve the employability of women in this upcoming sector.[2] In 2019, CURIE-AI Facility established 6 AI labs across 6 universities in India.

[1] <https://dst.gov.in/pressrelease/curie-initiative-dst-enhancing-research-facilities-women-universities>

[2] <https://dst.gov.in/pressrelease/curie-initiative-dst-enhancing-research-facilities-women-universities>



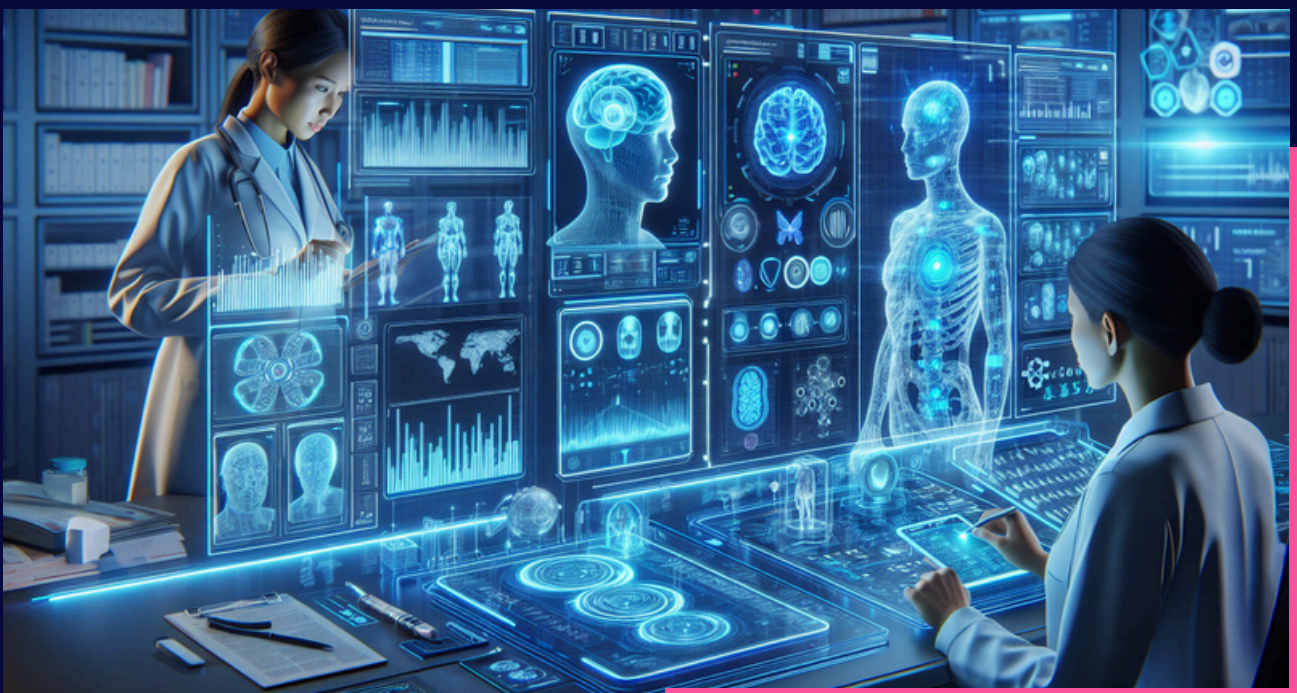


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DEPARTMENT OF SCIENCE AND TECHNOLOGY

Science and Engineering Research Board

Science and Engineering Research Board (“SERB”) in 2021 approved setting up of up-to 3 Centres of Excellence (CoEs) in the area of Earth and Atmospheric Sciences, for developing Artificial Intelligence & Machine Learning (AI & ML) approaches to geohazard, weather & climate prediction. These CoEs will be developed as network centres in linkages with the Ministry of Earth Science for better weather and ocean forecasting and long-term environmental sustainability, deep learning models for early warning of extreme geohazards and predict climate extremities and climate change mitigation, through high-precision analytics enabling India in the achievement of sustainable development goals (“SGD”).





SUPREME COURT

In the recent past, India has made much progress in creating tools, methods, and technologies to create legal knowledge and use it for services and delivery systems. Some use cases of deployment of AI in the judiciary are legal text summation, fact-search-identification, court administration, precedent retrieval, contract analysis, and argument mining. Artificial Intelligence Committee established by the Supreme Court of India, launched three AI tools, namely (i) -Supreme Court Portal for Assistance in Court's Efficiency ("SUPACE"), (ii) SUVACE, and (iii) (Sophisticated Creative And Intelligent) Interact ("SCI").^[1] Whether these tools will significantly impact justice delivery in India or not is highly debatable. There is not enough information available on either of these tools. For instance, which exact datasets these AI tools rely on, who is building these datasets, which is part of the AI committee, or how these datasets are being annotated is not in the public domain.

[1]<https://indianexpress.com/article/india/cji-launches-top-courts-ai-driven-research-portal-7261821/>

Supreme Court
Utilises AI
To Make Live
Transcriptions Of
Its Hearings

INDIA

'AI TOOLS
CAN BE
USEFUL BUT...'





GOVERNMENT OF ANDHRA PRADESH

Andhra Pradesh Transmission Corporation

This section discusses AI deployment in various State governments. It determines different sectors where AI has been deployed and analyses the AI technology through a human-centric AI framework.

Various state governments are trying to unleash the full potential of AI technology while deploying Artificial Intelligence in numerous sectors, ranging from education to surveillance; almost everything has been touched by AI technology. However, the large-scale AI deployment is being operationalized in the absence of a specific regulatory framework. This is the juncture where the real concerns related to AI deployment arise.

Andhra Pradesh: Transco develops system to forecast power consumption a day ahead using AI and ML

The system has been developed using 25 years of data, including climate data, holidays, Covid-19 lockdown and seasonal information, weather forecast, etc. which helps maximise profit in selling and minimise the generation costs.



GOVERNMENT OF ANDHRA PRADESH

Helping Farmers Increase their produce through AI

To meet the Central Government's target of doubling the income of farmers by the end of 2022, Hewlett Packard Enterprise's Center of Excellence and Bengaluru based NGO Agastya International Foundation, set up AI and IoT technologies in the local farms of Guipalli.[1] The aim of the initiative is to help farmers remotely monitor the crops, gain insights on subjects including temperature, water usage and soil conditions, increase the crop's nutritional value and reduce water consumption by up to 40%.[2] This AI-based solution in agriculture has picked up momentum in the agricultural sector, especially since the outbreak of COVID-19 pandemic as the initiative helped by helping them remotely monitor the crops and make decisions related to the irrigation, soil treatment, nutrition and harvesting without the need to visit the fields.[3]

[1] <https://indiaai.gov.in/article/ai-is-helping-farmers-in-andhra-pradesh-to-increase-crop-yields>

[2] <https://indiaai.gov.in/article/ai-is-helping-farmers-in-andhra-pradesh-to-increase-crop-yields>

[3] <https://indiaai.gov.in/article/ai-is-helping-farmers-in-andhra-pradesh-to-increase-crop-yields>





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GOVERNMENT OF PUNJAB

Automated Facial Recognition System

The AI-based face recognition system of the Punjab Police is an innocuous-looking app with an intuitive interface of a grid of orange icons on a yellow background with options like Face Search, Text Search, and Gang Tree Search. Through this AI-based surveillance, the Punjab police claims to prevent criminal activities. There is an assumption that guides authorities deploying facial recognition in India that using these systems does not raise privacy or surveillance concerns as law enforcement will only use facial recognition for benign purposes like tracking criminals and finding missing children. In the context of the Automated Facial Recognition System ("AFRS"), it is also argued that facial recognition simply adds "another information layer to an investigation by allowing a matching photograph of suspects or missing persons with the photo database of Crime and Criminal Tracking Network and Systems ("CCTNS")[1]".

This assumption is technically problematic. For facial recognition systems to work in crime prevention, the Punjab police must collect, store, and analyze data from every individual captured by the camera to recognize suspects or 'persons of interest.' In other words, if a system has to carry out the task of recognition in these use cases, it has to sort a positive match from a ton of negative ones. The authorities deploying facial recognition must assess that however laudable the goal of facial recognition systems may be, mass surveillance is a prerequisite for them to achieve these goals.

[1]<https://www.thehindu.com/opinion/op-ed/facial-recognition-is-an-invasive-and-inefficient-tool/article62109426.ece>



GOVERNMENT OF UTTAR PRADESH

Joint AI Research for Video Instances and Streams

Joint AI Research for Video Instances and Stream (“JARVIS”) is an AI-enabled video analytics platform developed by company named Staqu and deployed by the UP Police across 70 prisons to monitor inmates by monitoring real time footage from CCTV cameras across a vast network, and flagging any segment that looks to contain unlawful activity.[1] Key UP Police officials access Mobile App for Real Time insights on potential threats covering 900 km area across parameters like violence, unauthorized intrusions, illegal mobile phone and weapons.[2] Such initiatives raise grave concerns around the right to privacy of individuals. Such initiatives could lead to wrongful intrusion into a person’s private life in addition to unnecessary surveillance in the name of security without any data protection or data governance framework.

[1] <https://www.meity.gov.in/writereaddata/files/75-75-India-AI-Journey.pdf>

[2] <https://indiaai.gov.in/ministries/government-of-uttar-pradesh>

JARVIS
Joint AI Research For
Video Instances And Streams

COVID-19 Identification System

- AI Powered Thermal Cameras For COVID-19 Detection**
Identify visitors directly through advanced thermal camera as they walk in and proactively safeguard your premises from COVID-19
- Touch Free & Infection Free Way To Identify Suspect**
No human interaction while checking visitors, let JARVIS do the work for you
- Trustworthy and Secure**
With Several AI patents an published papers, you don't need to worry about credibility and security. Our AI powered solution is being trusted and used by many law enforcement agencies and global companies across the world.

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GOVERNMENT OF MAHARASHTRA

Aaple Sarkar Bot

In March 2019, the Government of Maharashtra partnered with Haptik Infotech Pvt Ltd (an enterprise conversational AI platform) and announced a new AI-powered chatbot. As part of the Right to Public Services Act, 2015, the bot is deployed to complement existing mobile apps and websites that help with queries related to healthcare, education, public utilities, rural development, revenue, and other public related services.[1]

[1]<https://www.meity.gov.in/writereaddata/files/75-75-India-AI-Journey.pdf>

Centre for the Fourth Industrial Revolution

As part of the global network of Centres for the Fourth Industrial Revolution, the Government of Maharashtra and World Economic Forum (“WEF”) signed a MoU in January 2018 to set up ‘Centre for the Fourth Industrial Revolution’ in Mumbai.[1] The Government of Maharashtra aims to undertake the project on drones to collect the data that will enable them to improve crop productivity, crop disease surveillance, agriculture prediction and how to advise farmers on appropriate farming practices by revolutionizing the agricultural sector with drones.[2] The global network of Centres for the Fourth Industrial Revolution aims to develop, implement and scale up agile and human-centred pilot projects that can be adopted by policy-makers, legislators and regulators worldwide.[3]

[1] <https://indiaai.gov.in/ministries/government-of-maharashtra?initiative=ictai-rural-healthcare>

[2] <https://www.weforum.org/press/2018/10/world-economic-forum-opens-centre-for-the-fourth-industrial-revolution-india/>

[3] <https://www.weforum.org/press/2018/10/world-economic-forum-opens-centre-for-the-fourth-industrial-revolution-india/>



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GOVERNMENT OF BIHAR

AI to Combat Air Pollution

In February, 2021, the Bihar State Pollution Control Board (“BSPCB”) and the United Nations Development Programme (“UNDP”) signed an MoU for a collaborative initiative to implement AI and remote sensing technology to detect key sources of air pollution through satellite image and real-time monitoring.[1] The MoU will give BSPCB access to use UNDP's Geo AI Platform. The initiative is aimed to fulfill the Central Pollution Control Board of India (“CPCB”) directive issued in 2017 that mandates the conversion of brick kilns across India to the less polluting zigzag design.

[1] <https://indiaai.gov.in/news/ai-shall-detect-air-pollution-sources-in-bihar>



40 percent of deaths worldwide are being caused by water, air and soil pollutions. Under UNDP's global leadership and Accelerator Labs, we are excited to try this GeoAI platform - It is a first-of-its-kind Artificial Intelligence application that will help the state government tackle environmental concerns more effectively. We want this to be a great success and we are confident Bihar's success would inspire pan-India as well as global scale-up. ”

DR. ASHOK KUMAR GHOSH

Chairman,
Bihar State Pollution Control Board state





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ANNEXURE



LIST OF ABBREVIATIONS

AFRS	Automated Facial Recognition System
AI	Artificial Intelligence
AIC	Atal Incubation Centres
AICTE	All India Council of Technical Education
AIM	Atal Innovation Mission
AMCHAM	American Chamber of Commerce in India
ANIC	Atal New India Challenges
ASSOCHAM	Associated Chambers of Commerce & Industry
ATIL	Atal Tinkering Labs
CCAOI	Cyber Cafe Association of India
CII	Confederation of Indian Industry
CAOI	Cellular Operations Association of India
CrPC	Code of Criminal Procedure
DPIIT	Department for Promotion of Industry & Internal Trade
FICCI	Federation of Indian Chambers of Commerce & Industry
GPAI	Global Partnership on Artificial Intelligence
IAMAI	Internet and Mobile Association of India
ICCPR	International Covenant on Civil and Political Rights
ICT	Information and Communication Technologies
IP	Internet Protocol
IPC	Indian Penal Code
ISPAI	Internet Service Providers Association of India
IT	Information Technology
IUSSTF	Indo-US Science and Technology Forum
LEA	Law Enforcement Agency
MeitY	Ministry of Electronics and Information Technology
MHRD	Ministry of Human Resources Development
MI	Mentor India



LIST OF ABBREVIATIONS

NAIRP	National Artificial Intelligence Resource Platform
NASSCOM	National Association of Software & Services Companies
NeGD	National E Governance Division
NGO	Non-Governmental Organization
NITI Aayog	National Institute for Transforming India
NLTM	Natural Languages Translation Mission
NPNT	No Permission No Take-Off
OECD	Organization for Economic and Cultural Development
OHCHR	Office of the High Commissioner of Human Rights
CCAOI	Cyber Cafe Association of India
PM STIAC	Prime Minister of India's Science, Technology & Innovation Council
PSA	Principal Scientific Advisor
SFLC.in	Software Freedom Law Centre, India
SDG	Sustainable Development Goals
STEM	Science, Technology, Engineering & Mathematics
TIFAC	Technology Information Forecasting & Assessment Council
UDHR	Universal Declaration of Human Rights
UGC	University Grants Commission
UIDIA	Unique Identification Authority of India
UK	United Kingdom
UN	United Nation
UNESCO	United Nations Educational Social & Cultural Organization
USA	United States of America
USAIA	US-India AI Initiative
WEF	World Economic Forum