# Proceedings of the Half day Conference on: "Artificial Intelligence: Potential Applications in Himachal Pradesh"



**Organized by**
**Himachal Pradesh Council for Science, Technology & Environment**

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## Venue:  Conference Hall, H.P. Secretariat, Shimla

## Dated:  15th May 2018

**Background**

Artificial Intelligence (AI) has been studied for decades and is still one of the most elusive subjects in Computer Science. This partly due to how large and nebulous the subject is. AI ranges from machines truly capable of thinking to search algorithms used to play board games. It has applications in nearly every way we use computers in society. The term artificial intelligence was first coined by John McCarthy in 1956 when he held the first academic conference on the subject. AI did not make it into the spotlight on the world stage until the arrival of chess supercomputer Deep Blue by IBM, which was the first machine to defeat the then-defending world chess champion Garry Kasparov in a match in 1997.

It is referred to as subfield of Computer Science. Artificial Intelligence is acted by machines, computers and mainly software. Machines mimic some kind of cognitive function based on environment, observations, rewards and learning process. Artificial intelligence is a science and technology based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering.

**Applications**

The main advances over the past sixty years have been advances in search algorithms, machine learning algorithms, and integrating statistical analysis into understanding the world at large. There are many AI applications that we witness: Robotics, Machine translators, chat bots, voice recognizers to name a few. AI techniques are used to solve many real-life problems. Some kind of robots are helping to find land-mines, searching humans trapped in rubbles due to natural calamities. AI is used in more subtle ways such as examining purchase histories and influence marketing decisions.AI is increasingly playing a greater role in our lives, and the latest trends are AI chips and the accompanying smart phone applications. AI algorithms have been used in data centres and on large computers for many years, but are only more recently present in the realm of consumer electronics. Word processing or checking the grammar and spelling of a text is a classic application of symbolic AI that has been used for a long time.

**Task Force on Artificial Intelligence**

Although in comparison to its global counterparts, India is a bit late to the AI party, the energy and enthusiasm of the Indian government is at its peak. The Ministry of Commerce and Industry, Government of India has constituted a Task Force on Artificial Intelligence for India's Economic Transformation in 2017. This Task force comprises of experts from varied administrative and professional backgrounds. (notification is at Annexure- I list of members of AI Task Force Annexure -II)

**Highlights of the AI Task Force Report**

- ➤ 10 areas where artificial intelligence utilisation can add significant value to the existing processes and boost productivity include Manufacturing, Fintech, Healthcare, agriculture/ food processing, retail/ customer engagement, Aid for Differently Abled/Accessibility Technology, public utility services, education and national security.
- ➤ The most important challenge in India is to collect, validate, standardize, correlate, archive and distribute AI-relevant data and make it accessible to organizations, people and systems without compromising privacy and ethics.
- ➤ The four grand challenges for artificial intelligence incorporation in India are improving manufacturing, especially in the SME (small and medium-sized enterprises) sector; improving healthcare quality; improving agriculture yields; and improving delivery of public services.
- ➤ Strong IP mechanisms are required to encourage and protect innovations in AI
- ➤ Government policies to be framed around corporate stakeholders, educational and legal institutions.

**Announcement on AI in Budget 2018**

On Feb. 01, delivering his budget speech, finance minister Arun Jaitley told parliament that the government think-tank, Niti Aayog, will spearhead a national programme on AI, including research and development. Running high on the momentum of 'Digital India', the government also doubled allocation to this programme to $480 million in 2018-19, deciding to invest heavily in research, training and skill development in technologies such as AI, digital manufacturing, robotics, Quantum communication and Big Data intelligence, 3D printing, Block chain, Machine Learning and Internet of Things.

**The Conference**

Himachal Pradesh Council for Science, Technology & Environment, Shimla organized Conference on **"Artificial Intelligence: Potential Applications in Himachal Pradesh"** on 15<sup>th</sup> May 2018. The objective of the workshop was to generate awareness and to promote use of AI in Potential Applications in Himachal Pradesh. The Hon'ble Chief Minister of Himachal Pradesh Sh. Jai Ram Thakur was the Chief Guest of the Conference. The Hon'ble Minister for Science & Technology and Health & Family Welfare, Sh. Vipin Singh Parmar was the Guest of Honour.



Experts for the workshop included Prof. V. Kamakoti, Chairman, Artificial Intelligence Task Force constituted by the Ministry of Commerce and Industry, Govt. of India, Dr. Anurag Agrawal, Director, Institute of Genomics and Integrative Biology (CSIR-IGIB), New Delhi and Dr. Santanu Chaudhury, Director, Central Electronics Engineering Research Institute, Pilani, Rajasthan. Sh. Tarun Kapoor, Addl. Chief Secretary (Environment, Science&

Technology) and Sh. Kunal Satyarthi Member Secretary, HIMCOSTE were other dignitaries present on the occasion. The conference was attended by Administrative Secretaries, Heads of various Govt Departments, and faculty of various Universities, R&D institutions and media representative.

The programme commenced with welcome address by Sh. Vipin Singh Parmar, who emphasized on the applications of Artificial Intelligence. He said that this is a field which holds tremendous potential for betterment of basic facilities in day to day life of individuals from walks of life and also holds the key to economic transformation of Himachal Pradesh. He said that AI technology changes the face of medical science. There are a number of applications in which AI is used and gives incredible results. In medical science AI is used to create virtual personal health care assistant. Machine learning and AI is finding use in Disease Identification/ Diagnosis, Personalized Treatment/ Behavioural Modification, Drug Discovery/Manufacturing, Clinical Trial Research, Radiology and Radiotherapy, Smart Electronic Health Records, Epidemic Outbreak Prediction. He talked about the role of AI in day to day life. He said that banking and health sector are using AI in a significant manner in their routine functioning. He said AI can prove to be an effective tool in different areas for the society. It can also be used it to meet targets in various Government initiatives in the State.

Hon'ble Chief Minister of Himachal Pradesh Sh. Jai Ram Thakur praised the HP Council's effort in organizing a conference in the latest field of research of Artificial Intelligence in the State. He welcomed the speakers and praised their presentations. He said that technology has progressed in the last 15-20 years in a very dramatic way.

Telecom revolution which had raised apprehension of losing jobs in early stages later became the field to generate maximum job opportunities for the educated youth and changed the economic scenario of the country. Recently mobile technology has brought another important change in the lives of people. He emphasized that the present Prime Minister of India is laying great stress on "**Digital India Mission**". Praising the presentations made by the experts, he said that now we should think how to derive benefits from their talks. He said that illegal construction is one big issue in the State. How to tackle it, is one big question. We

should see how we can use AI technology to monitor and stop illegal construction in current scenario. Traffic congestion is another problem the State is facing. In times to come, we must think how to implement it to solve traffic problems of cities like Shimla.

Illegal mining is also a very big issue of the State. This technology should be used to monitor individual incidences of illegal mining activity. Developmental projects like road construction should be monitored on regular interval basis using AI applications. Illegal felling of trees should also be monitored by developing appropriate mechanisms and such incidences should be recorded as proof. He said that we should take measures to incorporate this AI technology in our policy as it holds tremendous potential and applications in various sectors in the State. Artificial Intelligence can be used by different govt departments in Himachal Pradesh like agriculture, horticulture, health, education, industries, disaster management, etc as has been demonstrated in lectures and videos of these experts. This would require well trained manpower in this field. Training programs and collaborative projects can be taken up with various prestigious institutes in the State and country as per the requirements of the concerned departments The Hon'ble CM also said that the State has many resources and facilities, but now we should work very hard in future by making best use of recent and upcoming technologies for holistic progress of the State.

After the inauguration of the workshop, the technical sessions proceeded with three important talks


First lecture was on **"Artificial Intelligence for effective governance and economic transformation"** by Prof. V. Kamakoti. He gave detailed information on Potential applications of Artificial Intelligence. He said that the Government should have control over the use of AI and their role in implementation of AI. It should be used in improving of quality of life, generation of new jobs etc. There are 3 important uniform challenges which are:

a. Data management (cleaning, collection, aggregation, and legalization.)
b. AI expertise development.
c. AI awareness

He talked about the Application Areasof AI. He said that Artificial Intelligence can be useful in manufacturing for Predictive Maintenance, Process Modernization and AI Machine-Man Hybrids. AI is also helpful in Health-Care for Health-Care Data Repositories and Clinical Decision Support Systems. He said can be used AI in intelligent and Precision Farming, Prediction and Reduction of Post Harvest Losses of Agriculture and Food Processing. He talked about the use of AI in different field like Education Retail/Customer Engagement, Aid for Differently Abled/Accessibility Technology, Environment, National Security and Public Utility Services.

He said that geo-tagging of every project sanctioned by Govt, which will give list of ongoing projects and, progress can be monitored, and public feedback can be gained/ public participation in govt can be ensured. Positive social attitude towards AI can be generated by publications, responsible use and by solving ethical issues. Automation technologies can be used to generate employment. Construction work progress can be monitored by using drones; and 2-D mapping of cities can be done. Automated estimation volume of cement and other manufacturing items; also, forest tress volume can be estimated. He said that AI as a problem solver rather than technological advancement, for the economic growth of the country. In H.P., AI can be used in traffic management; crowd control; events management; by using mobile phone towers. He showed videos on: Drone Video Analytics - Contains all Machine Learning based Solutions for drones, Speedobotix – Constructing Intelligent Robots made easy, Omni Nerve Centre - Containing the solution package for CCTV video analytics which can be used for monitoring thousands of city cameras and generating automated alerts, RoBoat - Prototype for cleaning Water Bodies.

Dr. Anurag Agrawal spoke about **"Artificial Intelligence (AI), Intelligence Augmentation (IA), and Intelligent Infrastructure (II): Towards better Healthcare & Governance".** He talked about the diversity of AI Applications He said that AI is way efficient than humans. (E.g. Work efficiency; tireless working; can manage a lot of work simultaneously; AI can process the information a lot way beyond the human capacity.) In India there is a great shortage of doctors, nurses and other medical staff. AI can be used in easy governance; as it requires data gathering, analysis of data from different sources, which can be difficult for humans. AI can be more prescriptive as it can be trained as solution finder based on available data. If the problem is too much data then the solution cannot come from humans. AI can simply diagnose all the factors of human attributes. Huge amount of data gets lost due to focus on the problem and ignorance of important side issues. Shift from electronic issues to personal issues. 90% of people are getting health advice on their mobile phones in developed countries. All the medical data of patients of H.P. can be gathered. Rare presentation of common disease & common presentation of rare disease can be done with the

help of AI.

Legal position: Humans will keep control over the working of computer for legal purposes only. All the available data will be utilized properly and legally. Cost effectiveness: cheap in cost, initially costs more but later it will be cost efficient in India.

The third lecture was given by the Dr. Santanu Chaudhury on **"Artificial Intelligence for Inclusive Progress"**. Artificial Intelligence can also help in Disaster risk management, conservation of food in agriculture, conjunction in tourism in Himachal Pradesh. He said that Robots could be actively used to speed up and can solve lots of problems in construction in hilly regions. In fact, it is helping in these areas in Japan. Robotics and automation as per current



technology trends can enhance quality of manufacturing, increase efficiency and reduce cost and increase profit margin. Artificial Intelligence can also be useful in the Watershed Management, 90% of Himachal's water drainage is through Indus River System.



Management of water resources in H.P. is critical for India. He said that Tourism is a major economic activity in Himachal. AI can provide a new dimension to tourism. Agriculture and food are other issues; data-driven techniques can help to boost agricultural productivity by increasing yields, reducing losses and cutting down input costs. NITI Aayog has initiated pilot project in some states in country in agricultural farming. He said that in Himachal Pradesh AI can use in Disaster Prediction Using Satellite and Aerial Images to predict the risk of landslides by observing steep slopes local geo-physical activities at micro and macro scale. AI-based analysis may be used to monitor aging infrastructure that could cause accidents, including roads and bridges. Artificial Intelligence can be a source of entrepreneurship in H.P.

Sh. Tarun Kapoor, Addl. Chief Secretary (Environment, Science& Technology) in his concluding remarks said that the HIMCOSTE, to begin with should take up 4-5 projects of various Govt. Departments on pilot basis. He said that this is a field which holds tremendous potential for betterment of basic facilities in day to day life of individuals from walks of life and also holds the key to economic transformation of Himachal Pradesh. He appreciated the efforts of the

HIMCOSTE for organizing this conference on an important and emerging field in the State.



At the end, Sh. Kunal Satyarthi Member Secretary, HIMCOSTE thanked the Chief Guest the Hon'ble Chief Minister of Himachal Pradesh Sh. Jai Ram Thakur, the Hon'ble Minister for Science & Technology and Health & Family Welfare, Sh. Vipin Singh Parmar, and Sh. Tarun Kapoor, Addl. Chief Secretary (Environment, Science& Technology). He thanked the three speakers for highlighting the significance of AI and its possible application areas in Himachal Pradesh. He thanked the Heads of various Govt. Departments, nominated participants and all the press and media persons for taking out time to attend this Conference.

**AI possible application areas in Himachal Pradesh**

- AI can be used in Health-Care- data repositories and clinical decision support systems. All the medical data of patients of H.P. can be gathered. Rare presentation of common disease & common presentation of rare disease can be done with the help of AI.
- AI can be used in traffic management; crowd control; events management; by using mobile phone towers.
- Artificial Intelligence can also help in Disaster risk management, conservation of food in agriculture, conjunction in tourism in Himachal Pradesh.
- Artificial Intelligence can also be useful in the Watershed Management.
- AI can be used in tourism and it can provide a new dimension to tourism.
- AI can use in Disaster Prediction Using Satellite and Aerial Images to predict the risk of landslides by observing steep slopes local geo-physical activities at micro and macro scale.
- AI-based analysis may be used to monitor aging infrastructure that could cause accidents, including roads and bridges.
- Artificial Intelligence can be used by different govt departments in Himachal Pradesh like agriculture, horticulture, health, education, industries, disaster management.
- Training programs and collaborative projects can be taken up with various prestigious institutes in the State and country as per the requirements of the concerned departments.