

**Special Centre for Disaster Research
Jawaharlal Nehru University**
Organizes the

World Symposium on Artificial Intelligence in Governance and Disaster Management

March 11-13,2019

Venue: Convention Centre of Jawaharlal Nehru University
New Delhi 110067

Concept Note:

We are just in time for a meaningful and appropriate dialogue and cross-disciplinary partnerships on Artificial Intelligence (AI) in governance and disaster management. The frequency and the cost of losses and damages due to disasters is rising every year. From wildfires to tsunamis, drought to hurricanes, floods to landslides combined with chemical, nuclear and biological disasters of epidemic proportions has increased human vulnerability and ecosystem sustainability. Life is not as it used to be and governance to manage disasters cannot be a business as usual. The quantum and proportion of responsibilities with the emergency services has increased many times to strain them beyond their human capacities. Its time that the struggling disaster management services get supported and facilitated by new technology of combining Artificial Intelligence (AI) and Machine Learning (ML) with Data Analytics Technologies (DAT) to serve people and government in disaster management.

AI and ML have advanced to a state where they could be utilized for many operations in disaster risk reduction. Even though many disasters cannot be prevented and a number of them are blind natural disasters yet through an appropriate application of AI and ML quick predictions, vulnerability identification and classification of relief and rescue operations could be achieved.

Given below are three major contributions of AI in DRR;

1. **AI & ML in Decision Making process**, digital mapping, aggregating & combining data from disaster response organizations such as is being done by the *Global Flood Detection System (GFDS)* or the *Artificial Intelligence for Digital Response (AIDR)* which are platforms built to “filter and classify social media messages related emergencies, disasters and other humanitarian calamities. AI can also link to the GPS/GIS systems, remote sensing and can obtain data much faster and more authenticated through satellite imagery. *DigitalGlobe* provides space imagery and geospatial content. This software on an Open data Program learns how to identify buildings, homelessness, water flow pathways for dams and rivers, oceanbed disturbances, volcanic reverberations much before human identifications of this information. *Tomnod* will prioritize administrative tasking according to damage assessments. Centre for Artificial Intelligence and Robotics at DRDO in India has developed *Netra (Network Traffic Analysis)* which is in use at RAW, IB and many other intelligence agencies in India. It can monitor and text based messages on Facebook, Twitter and emails/blogs etc. for predictive analysis. Such tools and techniques can also provide base to create exceptionally proficient Artificial Neural Networks to provide a cost-effective disaster risk reduction, rescue and relief distribution. Indian Army has been working on a multi-agent robotics framework which is being developed by CAIR (Centre for Artificial Intelligence and Robotics). This AI can replace some crucial assignments of soldiers in the field.

- 2. Increase Accessibility to Disaster Affected Population and Victims of Disasters:**
The 911 or 100 numbers may not be functional or be overloaded with calls unlike a regular day. AI would augment these systems and improve responses provided through emergency and disaster management centres. The normal voice based data could be improved to ingest many more types of data from text, video, audio and pictures alongside live images, real time emergency operations and their analysis to enable administration to make quick response and action. In USA, The Association of Public Safety has been using *IBM's Watson* to telephone devices. It not only reduces call times but also accelerates time-sensitive emergency services for the disabled, physically or visually challenged, sick and elderly people trapped in debris or in queer and humanly undetectable locations. *Blueworx* is a powerful IVR Platform which has been replacing emergency call centres.

- 3. Predictive Analytics for Smart City Safety Operations:** ML and AI can be of immense support in assisting through an analysis of past events, identify and extract patterns and vulnerability to natural and man made hazards and disasters. Many at-risk areas can be made visible through clustering algorithms which can classify disaster data on the basis of severity, climatic patterns and possibility learning tools. Many advances in cloud technologies and open source tools can help start emergency operations without much initial investments but with high potential applicability. *Optima Predict* a suite of software by *Intermedix* collects medical data on epidemics, criminal activities, stampede and riots etc. AI and its allied fields like robotics can send multifarious drone services fitted with sophisticated ML. Social media can be a big jungle where decision maker can get lost without providing relief to disaster victims. The sheer volume of Twitter data (350,000 tweets per minute, www.internetlivestats.com/twitter-statistics/) is beyond human consumption. A more structured data for use in dashboards, maps or programmes can be achieved through AI and ML. These developments can obtain 'sentiment analysis' by corroborating information on social media such as Facebook, Twitter, Instagram and You Tube by validating and correcting it to help on-ground aid relief workers, suggesting means to Disaster Relief Forces like NDRF in India. AI can also validate and scan mischief and criminality of any information which sometimes during troubled times exacerbate distress and panic if produced irresponsibly in haste.

However, there are some inbuilt dangers and cautions which cannot be ignored. AI can weaken human intelligence, generate inequality and also bring many ethical concerns in its applications for disaster management. Economics and Efficiency of AI should not shroud the dangers to Ethics and Integrity in DRR. *An administrator behind the AI is as important as the technology and attention to decision making which is inclusive to humans and nonhumans within a location specific culture of a community cannot be ignored. The hype for achieving AI needs moderation of the wise and more experienced senior people in the field.*

Sessions are divided into the following specific areas;

Themes:

1. AI in Decision Making
2. AI in Recognition, Planning and Mapping
3. AI and Early Warning Systems and Community Resilience
4. Media, Law and Governance
5. International and Regional Collaboration for Capacity Building in AI

6. AI, Vulnerability and Smart City Infrastructure

7. AI, Economics and Planetary Ethics

Plenaries for transdisciplinarity:

We plan four plenaries as given below besides the four regular sessions on AI applications mentioned in the concept note.

1: Ethics & Economics, balancing life and wealth generation. Chair:Dr. Vaishali Mangain, Portland University , USA

2: Judicial Processes, justice to disaster victims, state accountability. Chair: Justice Nasir Aslam Zahid(Rtd) Pakistan

3:Vulnerability, differently abled and Reaching the last victim. Chair:

4: Everything nonhuman needs protection too. Chair: Mr. K.M.Singh with World Animal Rescue

Special Focus: Artificial Intelligence and Smart City Infrastructure

The Smart City Mission was launched by the Government of India in 2015 with an aim to improve governance and infrastructural deficiencies in Indian cities. With nearly 40% of India's population and 75% of India's GDP expected to come from Indian cities by the year 2030, according to Census 2011, the mission is crucial for inclusive and sustainable urbanization. Over two years since the launch of the mission, 100 cities have been chosen from across the country to be developed as 'Smart Cities' based on 'area based approach'. The objective is to retrofit, re-develop the core infrastructure in these cities through application of 'smart solutions', incorporation of Information and Communication Technology and create a replicable model to act as a light house to other aspiring cities. However, the concept of smart cities in India has been plagued by definitional ambiguities and fractured policy framework. Over reliance on technocratic solutions for urban deficiencies, regeneration and re-development has failed to capture the realities of deeply entrenched inequalities and complex bureaucratic structures, which are the root of increasing vulnerabilities in the first place. The unequal access to hierarchical power structures and deep pocket self-interests of those at helm are the root causes of urban informality in planning, construction and land use in urban areas. However, over-reliance on ICT as a one stop solution and creation of Special Purpose Vehicles under the 'smart city' project, has come to be interpreted as creating zones of exceptions for access to few, while keeping citizen participation at abeyance. Over the years, the city administration has proved to be inadequate and ill prepared to deal with the mounting issues of deprivation and accessibility. The challenges have become manifold in a scenario of climate change, resulting in frequent deluge and droughts. However, the current conception of 'smart cities' enhances the process of de-politicization and corporate urbanism, rather than making cities more

resilient. It has failed to adequately engage with the concept of disaster preparedness and institutionalization of Disaster Risk Management authorities. Lack of accountability and overlapping jurisdiction in urban set-up has given way to disaster preparedness in urban areas becoming hostage to enforcement agencies, rather than a community based movement. The power structure in urban India is already marked by fragmentation of administrative arrangements and ambiguity of boundaries of jurisdiction resulting in executive negligence and political callousness. Supply side shortages and cumbersome regulations has led to the unscrupulous use of laxity in regulations by land mafia and builders, resulting in laws and regulations being flouted with impunity. No due cognizance is taken of the non performing officials, resulting in development process becoming risk insensitive. The gap in the administrative and punitive powers of Disaster Management institutions to enforce compliance with rules and regulations have made them 'soft institutions'. The constraints of land, finance, literacy and accessibility in a developing country such as India, demands a different approach to Smart cities. Training and capacity building of first line responders becomes imperative for smart citizens and urban resilience. This remains the sole way for replacing the commodification of culture with 'regime of compliance and accountability' in our smart cities tomorrow.

Conference Coordinators:

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