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ADERSIM-IBM PARTNERSHIP IN BIG DATA

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Abstract. This short notes announces the recent development of the Advanced Disaster, Emergency and Rapid Response Simulation Initiative, in collaboration with IBM-Canada. Focus is on the Big Data analytics techniques and the IBM's Intelligent Operations Centre for Emergency Management platform.

Although use of big data is not a new concept in the field of disaster and emergency management (DEM), recent trend in big data production, storage and availability has taken DEM to the next level. "Big data is revolutionizing emergency management and transforming how communities protect citizens and property in times of emergency" [1].

Many DEM agencies are already using the power of big data in various aspects of disaster mitigation, preparedness, response and recovery. Use of social media data is gradually becoming routine in DEM and its usefulness and power has been tested in rapid earthquake damage and impact assessment, disaster response and relief operations. From using mobile phone data for tracking pandemic such as Ebola in Africa to tracking population in downtown Tokyo after the earthquake, a new trend is emerging that enables emergency managers to benefit much more from the data that is being continuously produced by various agencies at each geographic boundary. However, incorporating analytical, visual, and predictive capabilities of big data in DEM field has its own hardware, software, integration, and cultural challenges [3]. In particular, it requires user friendly applications that can turn big data into useful information for end users. This can be achieved through close collaboration and partnership between researchers, industry, and end users.

To establish such a close collaboration, York University (Canada) is developing the Advanced Disaster, Emergency, and Rapid Response Simulation (ADERSIM) Initiative. This Initiative has been primarily funded by the Ontario Research Fund and Natural Sciences and Engineering Research Council of Canada (NSERC) Collaborative Research and Training Experience Program (CREATE) . This collaborative effort involves over 30 researchers across Canada and a number of partner organizations. ADERSIM Initiative has two major components: the ADERSIM

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infrastructure and the ADERSIM Research and Training. We refer to [2] for the Research and Training component.

The ADERSIM facility will be equipped with web-based, agent-based software tools; a unique 3D immersive virtual reality lab kit for mobile communications; augmented reality and image analytics; a robust communications and digital media system; unmanned ground and aerial vehicles for networked research and search; next-gen sensing, positioning and navigation on a converged network; and digital signage. The ADERSIM researchers and their trainees will develop technologies and tools for simulating major DEM planning and operational functions: disaster mitigation and prevention, emergency drills, public education, emergency information and warning, evacuation, rapid disaster impact assessment, search and rescue, disaster logistics and medical services, volunteer and donation management, emergency social and psychological services, debris management, and recovery and reconstruction. "ADERSIM will enhance Canadas capacities in public safety and emergency management through a state-of-art simulation and emergency management information system", according to Robert Haché, Vice-President, Research and Innovation, York University.

ADERSIM in collaboration with IBM-Canada, a number of startup companies, and a large number of local, regional, and national organizations in both public and the private sectors are moving towards building a unique academic-industrial-public partnership in the domains of ADERSIM research and development. Equipped with the IBMs Intelligent Operations Centre for Emergency Management (IBMIOC) [4] platform, ADERSIM partners aim to bring the big data capabilities into the hands of emergency managers planning and decision making processes in all phases of DEM cycle.

IBM IOC is a DEM solution which integrates, correlates and analyzes operational information to create a dynamic, geospatial, common operating picture and analytic-based insights that speed decision making and time-to-action in small and large scale disaster and emergency situations. The IOC is providing a platform for analysis of big data in emergency planning and response. As part of this partnership, more than 15 startups from across Canada are being engaged in developing hardware and software tools, technologies, and applications that are developing DEM applications using big data while benefiting from IBM cloud services.

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