## 1 Vision for the Platform (0.5 page)

We propose to build a collaborative platform leveraging existing Canadian built research systems and international standards for data interchange shared by several domains of knowledge, including astrophysics, oceanography, remote sensing, fisheries, emergency management and robotics. This platform would allow for the exciting possibility of combining data and algorithms across these different domains. Example use cases include:

1. A forest fire-fighter consulting her smartphone before approaching the fire to see an immersive view of when the fire is at this moment from near real-time remote sensing combined with GIS data of the terrain and perhaps more importantly where it will be in five or ten minutes by harnessing an HLA simulation of the propagation of the fire using the most recent data on the fire, wind and the forest.

2. The development of a robotic emergency rescue first responder equipment through a simulation of the design in the actual terrain of interest. With parallel computation, thousands of potential designs could be tested and modified using a genetic algorithm in a matter of minutes to find the optimal design.

3. Data products for management of natural resources combined with climate change, potentially taking into account the subtle interplay between melting ice fields and agriculture on a global scale.

4. A public health researcher correlates medical outcomes in a private database against geographical data to discover new trends underlying disease, without gaining access to any private data.

## 2 Expected Impacts and Added Value (1 page)

Many Canadian built research tools either involve domain specific geographical data (e.g. Ocean Networks Canada) or specialized provisioning of distributed computational resources (e.g. CANFAR). Currently, to interact with this data or perform computations, one not only has to be an expert in the particular sub-discipline but also in each interface of the underlying tool or the data representation. We believe these efforts are now mature enough to compose their collective APIs into one standard interface available for users from around the world to collaborate through a web browser.

The key tenet of the proposed platform will be to exploit existing tools, data sets, and standards to provide an interactive interface for industry stakeholders and the public. This will enable multi-disciplinary and multi-sectoral networks of stakeholders to create strategic international partnerships. Not only will exchanges be accelerated, but existing Canadian efforts will be better internationalized. Promotion of standards would dramatically increase access to existing infrastructure and data, foster collaboration among international stakeholders and ultimately yield new understanding of our environment, natural resources, more rapid development of robotic technology and better situational awareness for defense and emergency management.

## 3 Model for Collaboration (1 page)

## 4 Strategic Plan (2 pages)

gathering of existing tools: SEDRIS, HLA, VO, MAST interface
gathering of data sets and algorithms (new stakeholders)
development of interoperability tools and standard
identification of infrastructure partners (google, amazon, microsoft): where will the data go, how to get computing, how to put it all together

## 5 Proposed Team (2 pages)

The partnership consists of representatives from UVic, UBC, SFU, Compute Canada, tOcean Networks Canada, he Space Telescope Science Institute, International Virtual Observatory Association, and industry

partners from Urthecast and Magnetar Games. UrtheCast will provide multispectral remote sensing data and have strong expertise in GIS. Magnetar games provide expertise on immersive user interfaces and augmented reality. We envision developing web-based prototypes allowing a non-expert citizen scientist to not only access the data but to interact with the data as an expert would, creating new simulations and perhaps more importantly to combine data from different domains to generate new understanding.

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## 6 Management and Governance