ComputationWorld 2020 Congress, ISBN: 978-1-61208-099-4, October 25, 2020 to October 29, 2020 - Nice, France
COGNITIVE 2020, The Twelfth International Conference on Advanced Cognitive Technologies and Applications

3D SpaceQuantumIndexation and Computation via VoxelNET to enhance 3D Cognitive Systemisation

-Reasoning, Raycasting and GeoLoacted Voxels

Charlotte Sennersten | 201020

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by

Charlotte Sennersten Craig Lindley

IARIA

International Academy Research and Industry Association

Presenter: Charlotte Sennersten, CSIRO Mineral Resources , Australia

charlotte.sennersten@csiro.au

Resume of the presenter

Sennersten is a Computer and Cognitive Scientist by background.
She has over 20 years worked with both physiological sensor data
and environmental sensor data in 3D real world contexts and 3D gaming environments.
Her aim and ambition has been to build a 3D Digital System where all these data can be
volumetrically indexed and geolocated in a computational beneficial infrastructure.



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Topics of research interest of your workgroup and current projects you are working on:

Big 3D optical data files and discretise these to not have to upload/download full files

Voxel Traversing in Space and Displaying Data Info

Volumetric geo provenance, mineral tracking and tracing algorithms

Industry needs

Computation and Cognitive/AI Command and Control

Australian Mining Industry –Companies

Commercialisation of VoxelNET

Paper overview

Abstract—**A global recursive equal-volume spatial quantization and indexation system can unify access to, use and volumetric computations across diverse fields to provide a volumetric evolution from the current 2D internet. A unifying spatial framework has been developed to demonstrate this alternative. The framework supports cognitive spatial analytics incorporating different datasets, advanced AI systems, human decision support, robotic and autonomous systems, and many other applications for which three-dimensional spatial structure is important. Domains in question can include a variety of sensor inputs, including environmental, physiological, neural, material, chemical, optical, locational (e.g. GPS and lidar), etc. Sensor data in diverse domains is used to create domain-specific models for analytics and decision support, and for models of human cognitive performance amenable to automated, machine implementations. The system includes a unified, hierarchical spatial quantization system with time series data and fixed, locational, and mobile volumetric structures. The framework supports data, information and knowledge management and can also be used to manage the distribution of computational loads. It can also support new computing paradigms, e.g. tracking the spatial locations of geographically dispersed computations linked by quantum entanglement.**

Keywords-Spatial Cognition; Voxelisation; Computation; Sensor Integration.

The goal of the computer and cognitive science research is to provide the software engineering implementation with guidance and a systemized volumetric infrastructure so people/users can share and understand otherwise siloed volumetric data.

An analogy might help to explain why all this is important. Imagine yourself ‘scuba diving’ and navigate yourself through water. You may not know what is ‘up’, ‘down’, ‘left’ or ‘right’ and nor does the sensors know when they capture the environmental, physiological or optical data. VoxelNET and its indexation helps to geo index, cross-correlate, compute and contextualize the data in its global volumetric architecture. Our research purpose is to make sense of sensed and captured data.

Outline of the paper

The Global VoxelNET Infrastructure

Altitude

Depth

3D Digital Earth

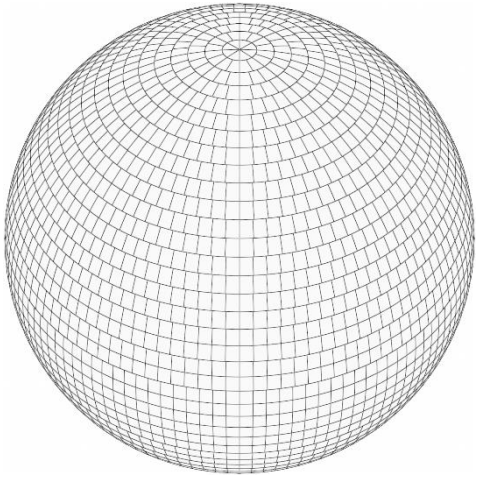


Figure 2. VoxelNET Earth quantization.

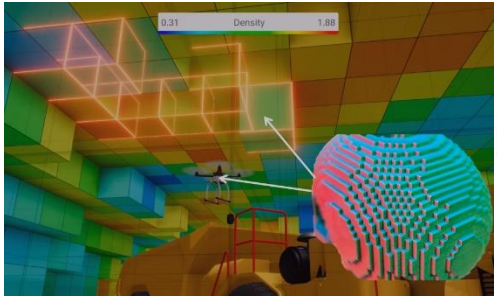
A Voxel

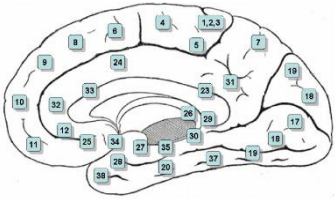
The Local View of Sensors

COGNITION [PHYSIOLOGICAL SENSORS]

SPACE [ENVIRONMENTAL SENSORS]

within the Global VoxelNET Infrastructure





Inner brain 3D mapping [22].

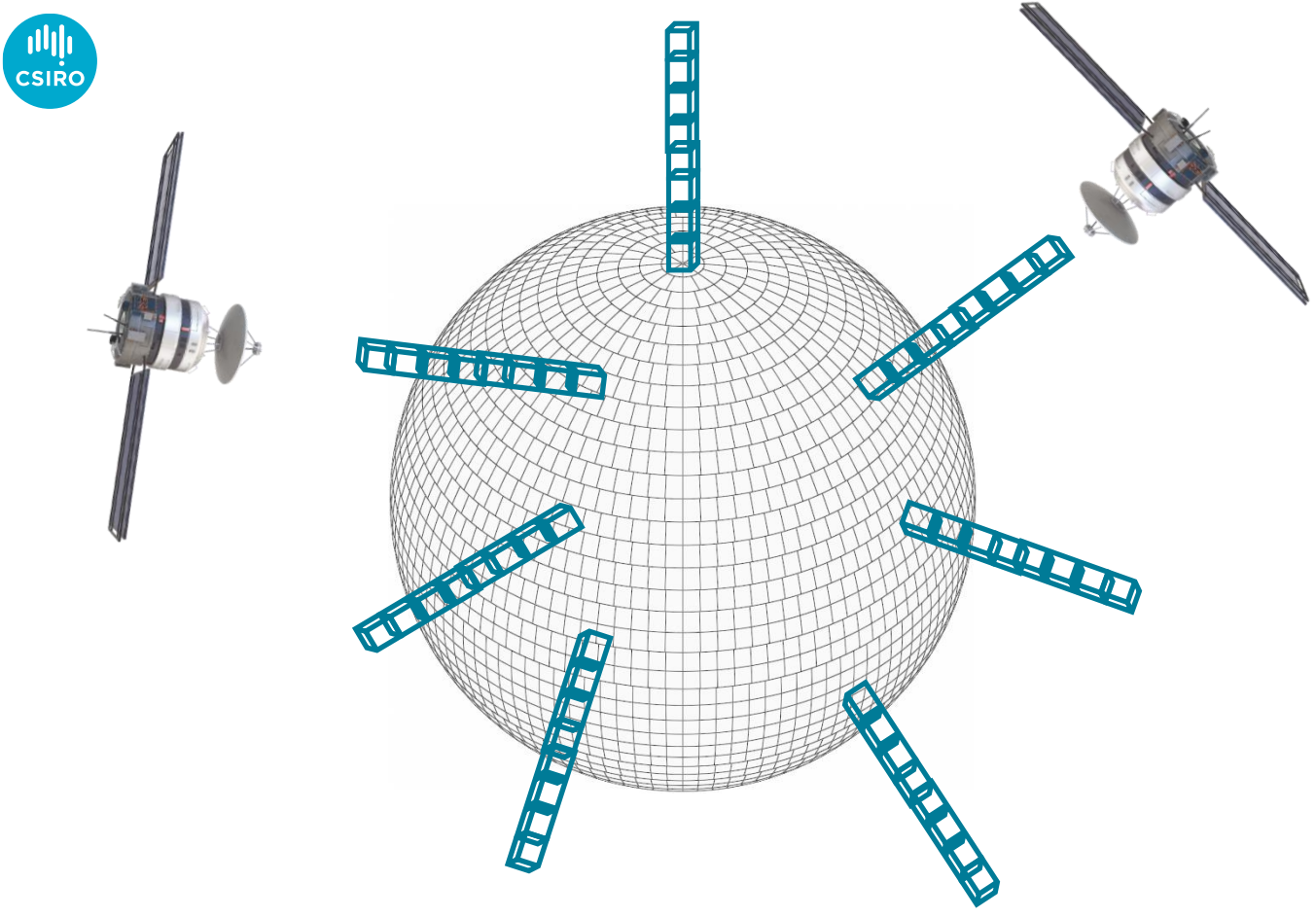
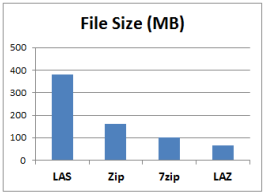
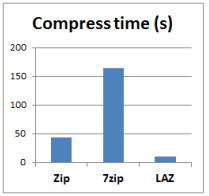
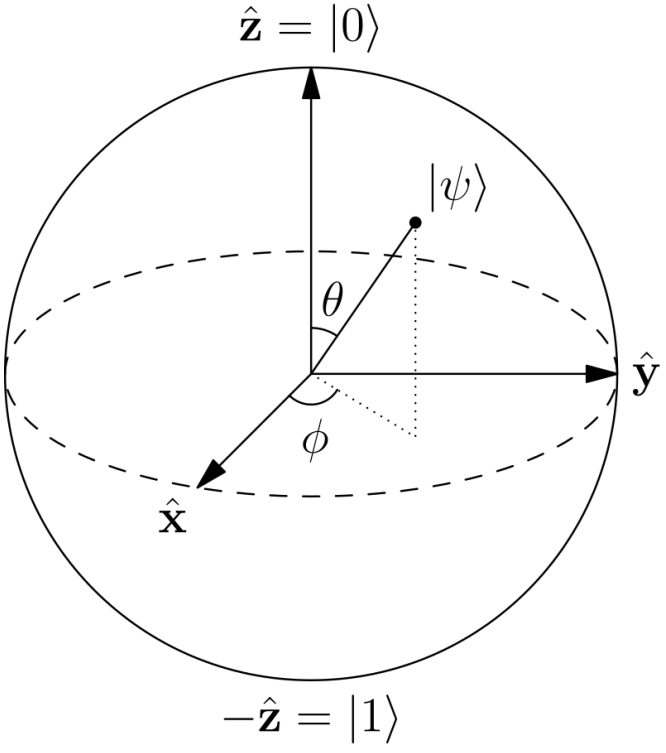


Figure 2. VoxelNET Earth quantization with altitude and depth infrastructure volumes for data analytics.

Parallel Processing and Quantum Computing



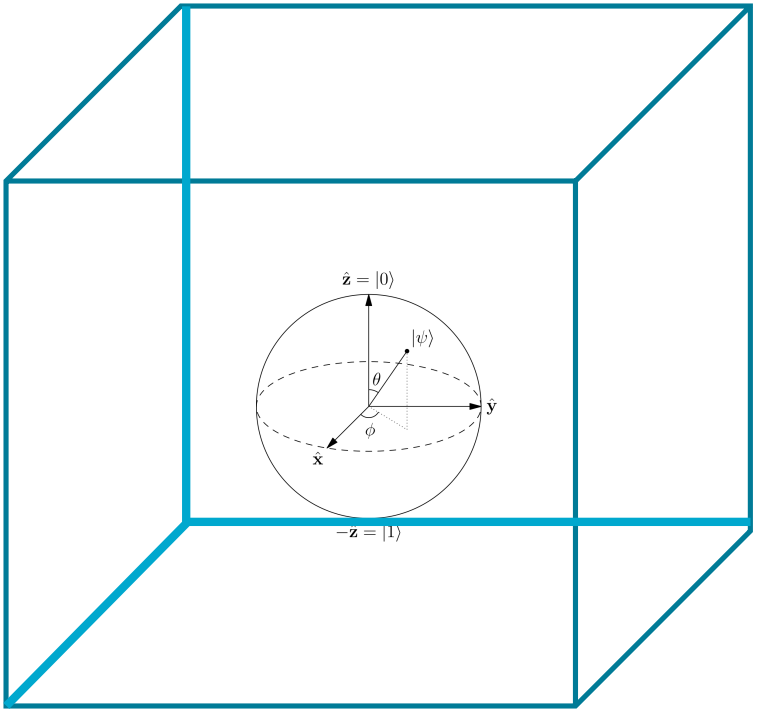




A Voxel

Figure 8. The quantum Bloch sphere, a geometrical representation of a quantum state space.

Voxel with a Quantum Qubit



Thank you

Mineral Resources
Dr. Charlotte Sennersten
Presenter

+61 0499 240053

charlotte.sennersten@csiro.au
www.csiro.au