# **otWeek**

# Metaverse, Spatial Web, Web 3.0 for industry and the new society

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Tuesday 21st June - 9:00 am Croke Park Conference Center - Hogan Mezzanine 2

## About us.

Software (SaaS) company based in in LA and Eindhoven founded in 2018

- VERSES is a next-generation AI company providing foundational technology for the contextual computing era.
- We provide the market with three solutions.
  - 1. Al-based Autonomous applications
  - 2. Context-Aware, AI-Operating System (COSM OS)
  - 3. Spatial Web Protocols (HSTP, HSML)
- Fortune 500 companies clients (logistics, mobility, smart cities)

## TO METAVERSE...





## THE METAVERSE DREAM

Open Interoperable Contiguous Persistent Immersive Portable Economy



# NIANTIC **NIANTIC**

# REAL WORLD OR OMNIVERSE

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# Parisi's Seven Rules of the Metaverse

1. There is Only One Metaverse. 2. The Metaverse is for Everyone. 3. Nobody Controls the Metaverse. 4. The Metaverse is Open. 5. The Metaverse is Hardware-Independent. 6. The Metaverse is a Network. 7. The Metaverse is the Internet.

Parisi, T. (2021, October 22). The Seven Rules of the Metaverse. Medium. Retrieved October 23, 2021, from https://medium.com/meta-verses/the-seven-rules-of-the-metaverse-7d4 Almudena6cv, CC BY-SA 4.0 <a href="https://creativecommons.org/licenses/by-sa/4.0">https://creativecommons.org/licenses/by-sa/4.0</a>, via Wikimedia Commons, Retrieved from https://commons.wikimedia.org/wiki/File:Vaporwave-4K-Wal

# WHAT'S NEW?

## **A NEW ERA OF INTERNETWORKING**





## **THE SPATIAL WEB**

The next generation internet that enables a hyper-integrated, contextually-aware, ethically-aligned network of humans, machines, and Al.





A report from the Deloitte Center for Integrated Research

## The Spatial Web and Web 3.0

What business leaders should know about the next era of computing



"The Spatial Web eliminates the boundary between digital content and physical objects..."





## **THE SPATIAL WEB**



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## SMARTER CYBER-PHYSICAL INFRASTRUCTURE



PRIVACY

VERSES

TRUST

Confidential, VERSES 2018

## **STANDARDS** are key

### **SPATIAL WEB STANDARDS AND PROTOCOLS -**





Hyperspatial Transaction Protocol (HSTP) & Hyperspatial Modeling Language (HSML)

First Draft Specification Unanimously Approved by IEEE Spatial Web Working Group December 2021

## "Public Imperative" WG P2874

## 90+ International participants and growing



## SWF one of the founding members







## Metaverse standards forum

www.metaverse-standards.org



## THE SPATIAL WEB: CHALLENGES ADDRESSED



## VERSES leverages the SPATIAL WEB PROTOCOLS to **optimize and automate the flow of people and things within and through places / spaces.**

In order to do that, machines need to understand the world the same way humans do. We need to rethink how to **describe the world to machines**, **internetwork data**, and be able to execute and **govern systems and activities** of people and things **at scale**.

## THE DIMENSIONAL CHALLENGE

Multidimensionality and shared understanding of reality

## **PROGRAMMABLE SPACE**

Today's Enterprise Systems are "Dimensionally-Challenged"



## INFORMATION (2D)

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## **HOLONIC SPATIAL DOMAINS**

Spatial Domains are **digital titles linked to 3D volumetric locations** such as buildings, parks, streets, or larger regions such as cities, states, continents and trading blocs. Spatial **Subdomains** represent sub-spaces that

have holonic structure confer additional rights.

Spatial Domains enable secure management of digitally mediated rights and permissions for:



- Who/What is authorized to access the domain
- What content or data is available to view
- Who can publish and modify content
- Who can transact or interact within it



# HSTP allows queries and smart contracting

HSTP or Hyperspatial Transaction Protocol enables IoT sensors to identify, localize and update the state of objects in space, over time. By supporting credentialed search of objects within spatial ranges over multiple coordinate systems (lat/lon, xyz, t, etc.) across multiple dimensions (0D-4D etc.) and hyperspatial vectors (physical, purpose, policy)

#### MULTI-SOURCE (optical, temp, motion, pressure)

#### SPATIAL RANGE QUERY



#### MULTI-COORDINATE (lat, long, x, y, z, t,)



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#### MULTI-DIMENSIONAL (0D, 1D, 2D, 3D, 4D)



#### MULTI-VECTOR (spatial/semantic/social state)



## **HUMAN & MACHINE-FRIENDLY**

Combining **Digital Twin** (3D + ID's) + **Digital Thread** (Data Integrity) + **Spatial Contracts** (Rules) results in a spatial network that **links** people, places, things and their activities.



# CONTEXT & THE DATA INTERNETWORKING CHALLENGE

From data lakes to actionable knowledge



# Data is out of Context.

### **PROBLEM**

Today, context-specific results are difficult because the answers to these questions lie in siloed systems and schemas that can't easily be cross queried.



# Put Data into Context.

## **SOLUTION**

Define the relationships of entities, objects, locations and actions in an interoperable knowledge graph that maintains their context across databases, systems and schemas.



## **THE COMPLETE CONTEXT**

Permission-based (Societal) digital information and instructions about the world (Semantic) Presented in a physically coherent context (**Spatial**) in the world.



## **HSML CONTEXT GRAPH**

**HSML** - Hyperspace Modeling Elements form a canonical data model that can be used to digitally describe any class of user, object, policy and activity in physical, digital and virtual space.



## **REALITY SHARED ACROSS EDGES**





## **GOVERNANCE & REAL-TIME ADAPTIVITY**

Public and Private adaptive automation between networks of devices, applications, and users.

## THE OPERATING CHALLENGE

# Al, governance, interoperability and execution



## **COSM ADAPTIVE INTELLIGENCE LOOP**

Goal-based logic driven by requirements and constraints





**IOFLOW** 

**IoT Sensor Fusion** 

### PHYSICAL

DIGITAL

## COORDINATION WORKFLOW

**E2E Workflow Automation** 



**INTEROPERABILITY** 

DATAFLOW **Data Contextualization Fabric** 

**DOMAINFLOW** 

**Data & Device Governance** 



## **COSM SOLUTIONS IN ACTION**

Our flagship Industry-Specific Autonomous Apps built on COSM



### **SUPPLY CHAIN**

- Wayfinding to exact location
- Spatial Tasks and Instructions
- Capacity Optimization
- Rapid Asset Location
- Dynamic IOT Integration
- Spatial Analytics & Simulation

### **FACILITY MANAGEMENT**

- Inventory & Equip Management
- Optimized Routing
- Activity Validation
- Facility Management
- Regulatory Compliance
- Emergency Response

### **SMART CITY & MOBILITY**

- Land Title Management
- Mobility / Drone Compliance
- Climate Accounting
- Identity & Facial Recognition
- Public Services
- Digital Certificate Issuance

# Imagine a Smarter World.<sup>TM</sup>

## Thank you.

Philippe Sayegh philippes@verses.io

# **VERSES** Thank you.

### Philippe Sayegh

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# The cyber-physical (spatial) web

