AstroVisio
Davide Posillipo, Alkemy
Marco Di Francesco, Net Service

Project Overview

Main Topic
Scientific Visualization with Artificial Intelligence support

Specific Topic
Implementation of interfaces aimed at visualization and analysis through systems of virtual reality of scientific big data from the astrophysical nature both observational and theoretical.

The main goal of this project is the research and development of dedicated tools to the analysis of astrophysical data by making use of immersive technologies such as Virtual Reality (VR), the Extended Reality (XR), and Spatial Computing (SC), in order to efficiency and enhance the research.

Finanziato
dall'Unione europea
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Centro Nazionale di Ricerca in HPC,
Big Data and Quantum Computing

Project Overview

Consortium:
　　Auticon Srl (Milan),
　　Alkemy SpA (Milan)
　　Net Service (Cagliari, Cosenza, Lecce)

Consultants:
　　University of Cagliari, Department of Physics
　　MetaVerso

Technical Objectives, Methodologies and Solutions

Analysis and development of tools dedicated to the analysis of astrophysical data through immersive technologies: Virtual Reality (VR), Extended Reality (XR) Spatial Computing (SC)

Design of graphical interfaces and tools for pre-processing and data exchange with HPC systems

Implementation of an immersive Virtual Reality (PC-VR) application dedicated to the visualization and interpretation of pre-processed astrophysical data from from high-performance computing (HPC) systems.

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Technical Objectives, Methodologies and Solutions

We are going to use a **Design Thinking Approach** with 3 main phases:

- **Understand:** Look into the specific domain to detect problems, requirements with a multidisciplinary team and a strong governance to help achieving goals and make decisions

- **Build:** define, plan and implement efficiently MVPs (Minimum Viable Products) with an interactive approach to collect feedbacks and improve the products

- **Evolve:** support the adoption, understanding how to evolve the solution and measure the efficiency

Partners will work together with INAF to define the requirements, plan and interactly build this products, also by understanding, using and evolving INAF already done products and solutions

Involved Staff and new recruitments

Role	Partner
Data Science Senior Manager	Alkemy
Senior Developers	Net Service /Alkemy / Auticon
Solution Architect	Netservice
Domain Consultants	University of Cagliari
Rendering Consultants	Metaverso
Scientific Manager	Alkemy
PM	Alkemy
Governance	Auticon / Net Service / Alkemy
Designers	Alkemy / Net Service
HPC Experts	Net Service
Testers	Auticon / Net Service / Alkemy

Timescale, Milestones, SAL

WP	1	2	3	4	5	6	7	8	9	10	11	12
1 - Literature search on the latest advances in the field of Immersive Visualization / VR / XR / Spatial Computing and analysis of existing software and ecosystems		M1.1										
2 - Interview sessions with researchers on the state of the art in astrophysical data visualization, with the goal of defining the most relevant visualizations to be included in the MVP. PoC and MVP definition.				M2.1								
3 - Definition of data structures. Selection of technologies best suited for the defined data structures						M3.1						
4 - Implementation of multi-user immersive visualization VR software and documentation								M4.1			M4.2	
5 - Release of the software and documentation in Open format and dissemination of the results									M5.1			M5.2

Timescale, Milestones, SAL

DELIVERABLE	WP	Milestone	Month	SAL
D1 Libraries and technologies for VR/XR rendering and visualization of astrophysical big data	WP1	M1.1	2	**1 (3 months)**
D2 PoC and MVP features list, with description of UX and UI	WP2	M2.1	4	**2 (6 months)**
D3 Definition of the data architecture for VR/XR processing of astrophysical data	WP3	M3.1	6	
D4 Release of PoC (Partial Release)	WP4	M4.1	8	**3 (9 months)**
D5 Report on dissemination activities	WP5	M5.1	9	
D4 Release of MVP (Final Release)	WP4	M4.2	11	**4 (12 months)**
D5 Final Open Source release and Report on dissemination activities	WP5	M5.2	12	