

Digital Earth: Discussing Origins

Eugene Eremchenko

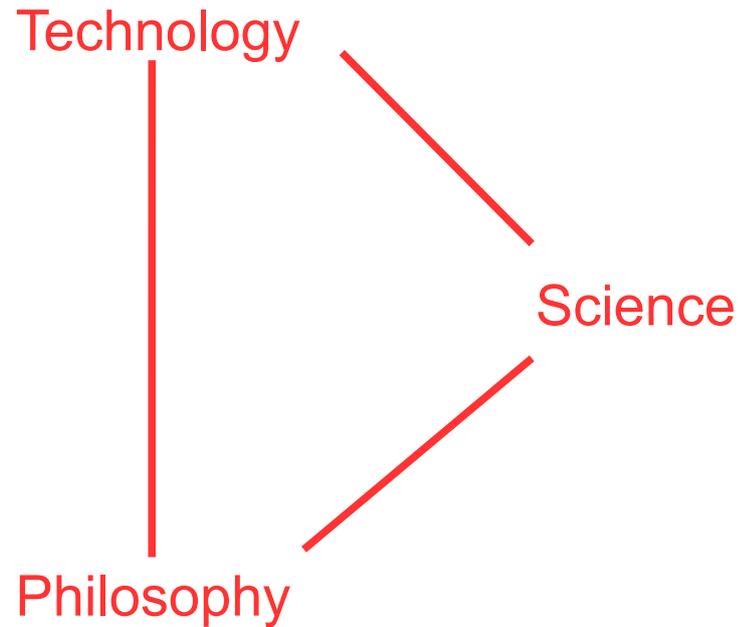
Moscow State University

Introduction

There is nothing so practical as a good theory
Kurt Lewin

There is nothing so **practical** as a good **theory**

There is nothing so scientific as a correct
philosophy



Digital Earth: Definition



Al Gore

The tools we have most commonly used to interact with data, such as the "desktop metaphor"... are not really suited to this new challenge.

I believe we need a "Digital Earth". A multi-resolution, three-dimensional representation of the planet, into which we can embed vast quantities of geo-referenced data.

Digital Earth: Definition



«Desktop metaphor» is just a map of surface, displaying the relative positions of objects on it.

Digital Earth is not a map.

What is the difference?

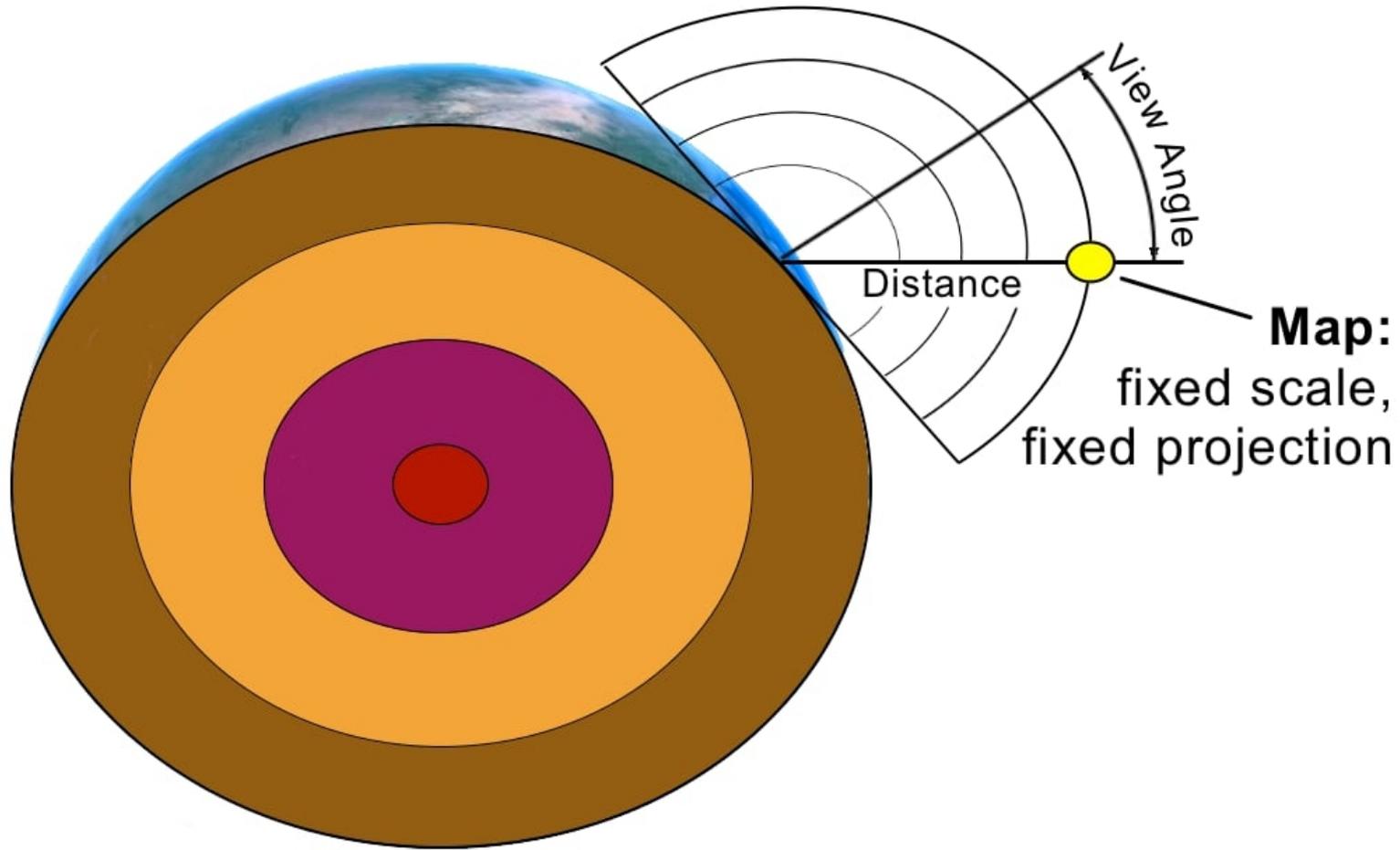
Digital Earth: Definition



A map is a "reduced, generalized image, constructed using a cartographic projection, of the surface of the Earth, another celestial body, or extraterrestrial space, showing objects or phenomena located on it in a specific system of signs"

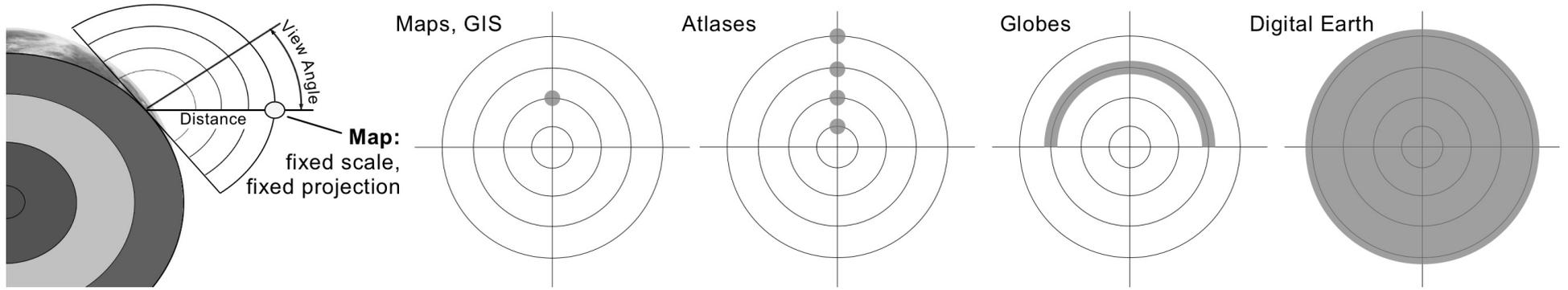
1. Scale
2. Projection
3. Signs

Typology of Mapping



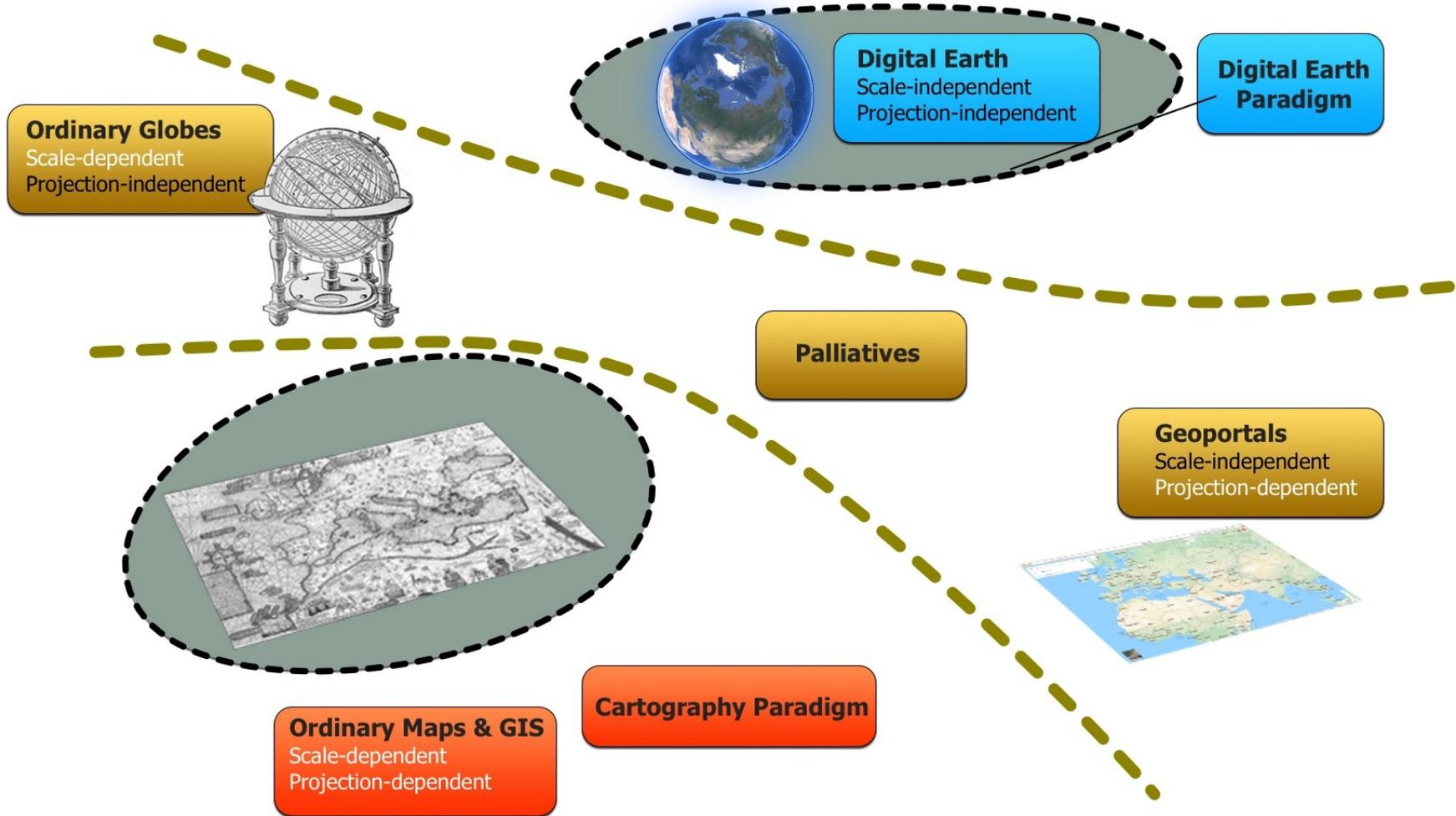
Scale/projection scheme

Typology of Mapping



Scale/projection scheme

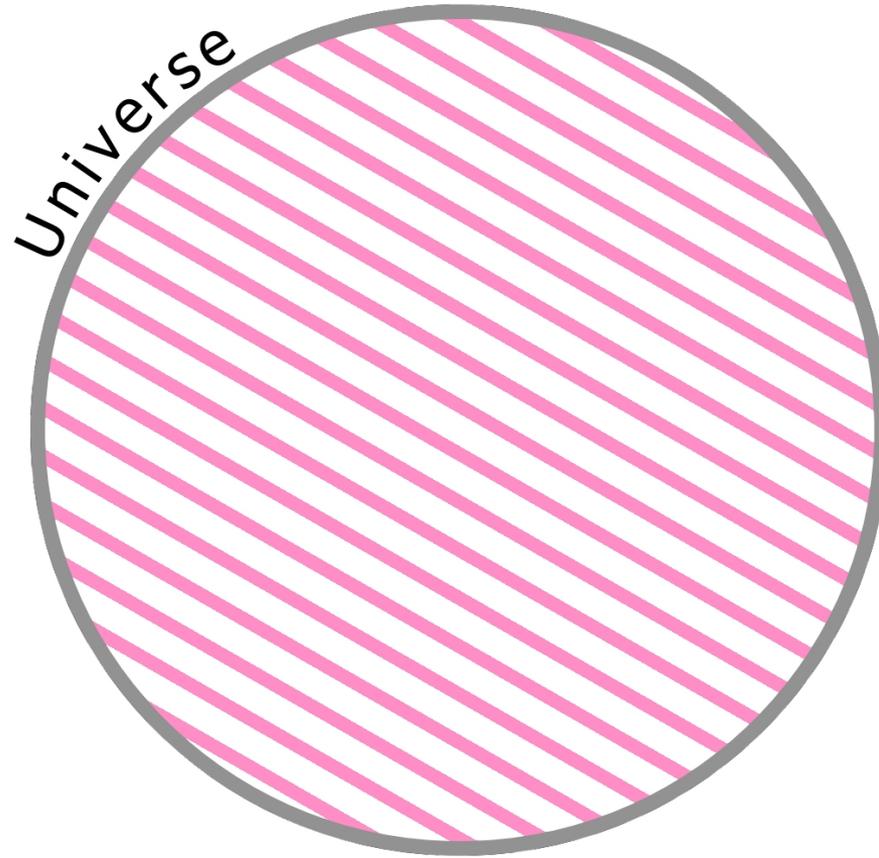
Typology of Mapping





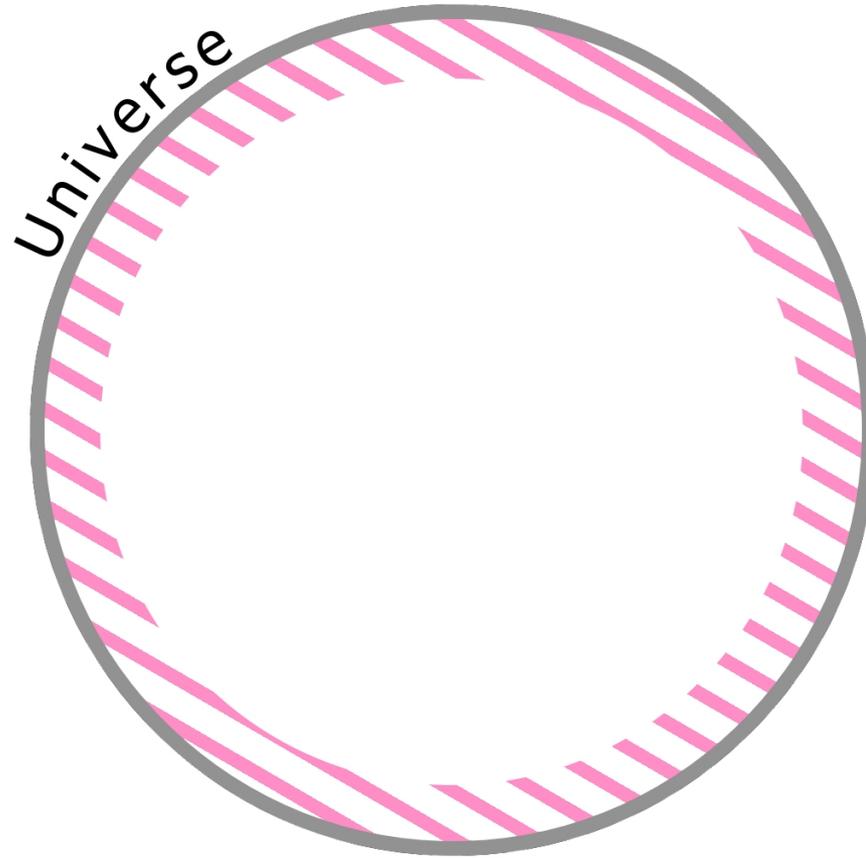
Visual perception without signs

Digital Earth and Semiotics



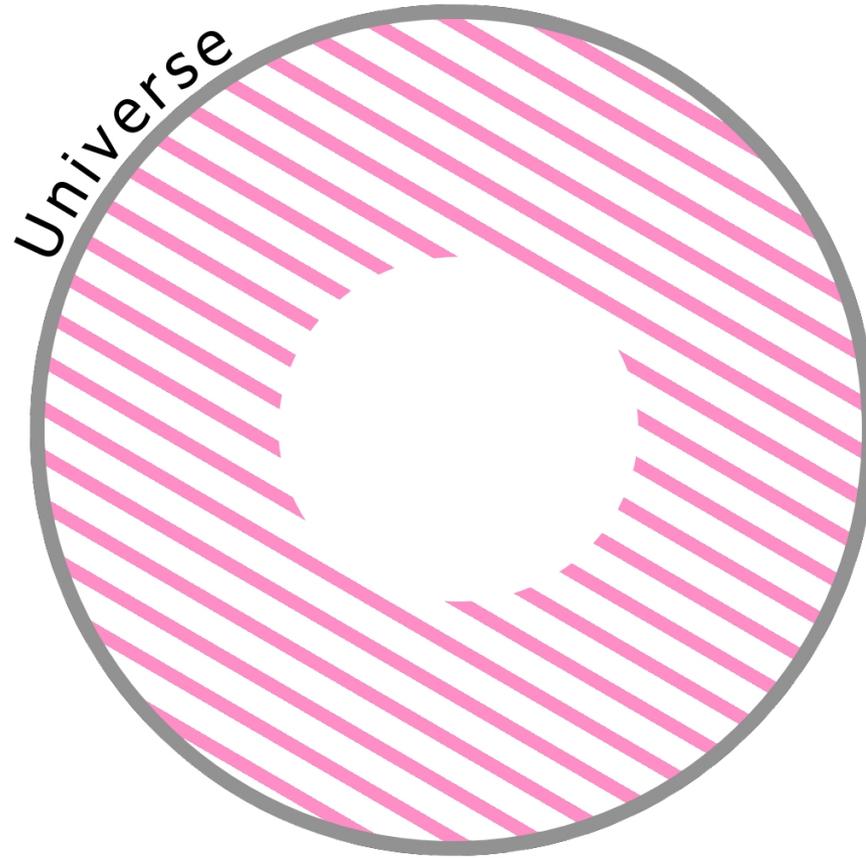
Digital Optimism

Digital Earth and Semiotics



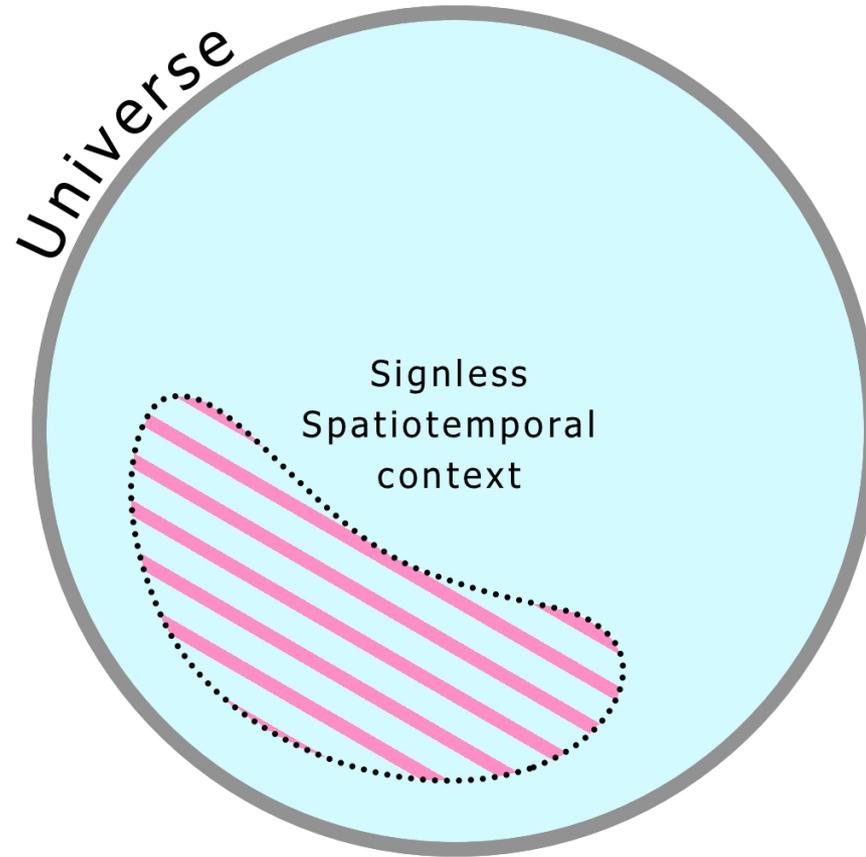
Neoplatonism

Digital Earth and Semiotics



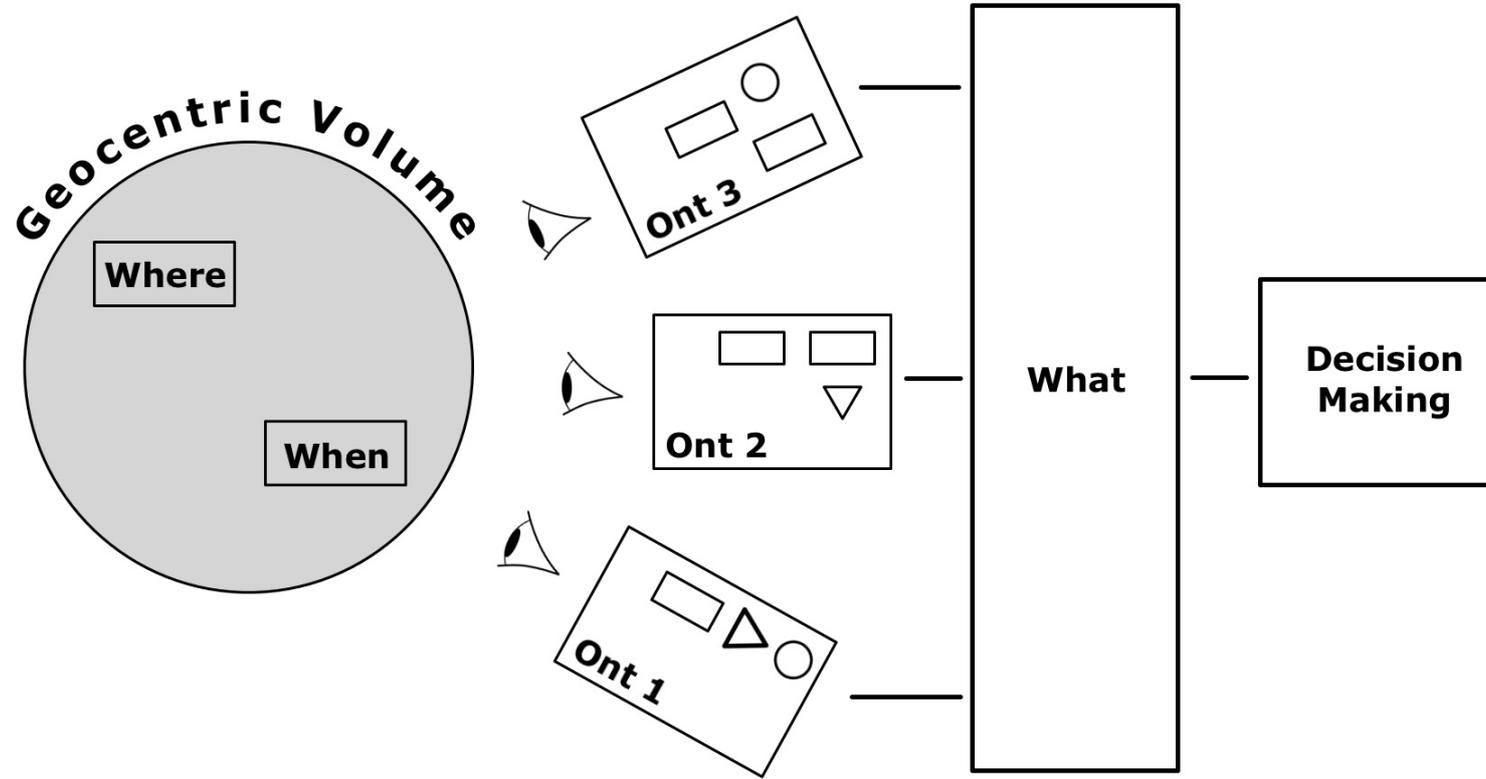
Cybernetics

Digital Earth and Semiotics

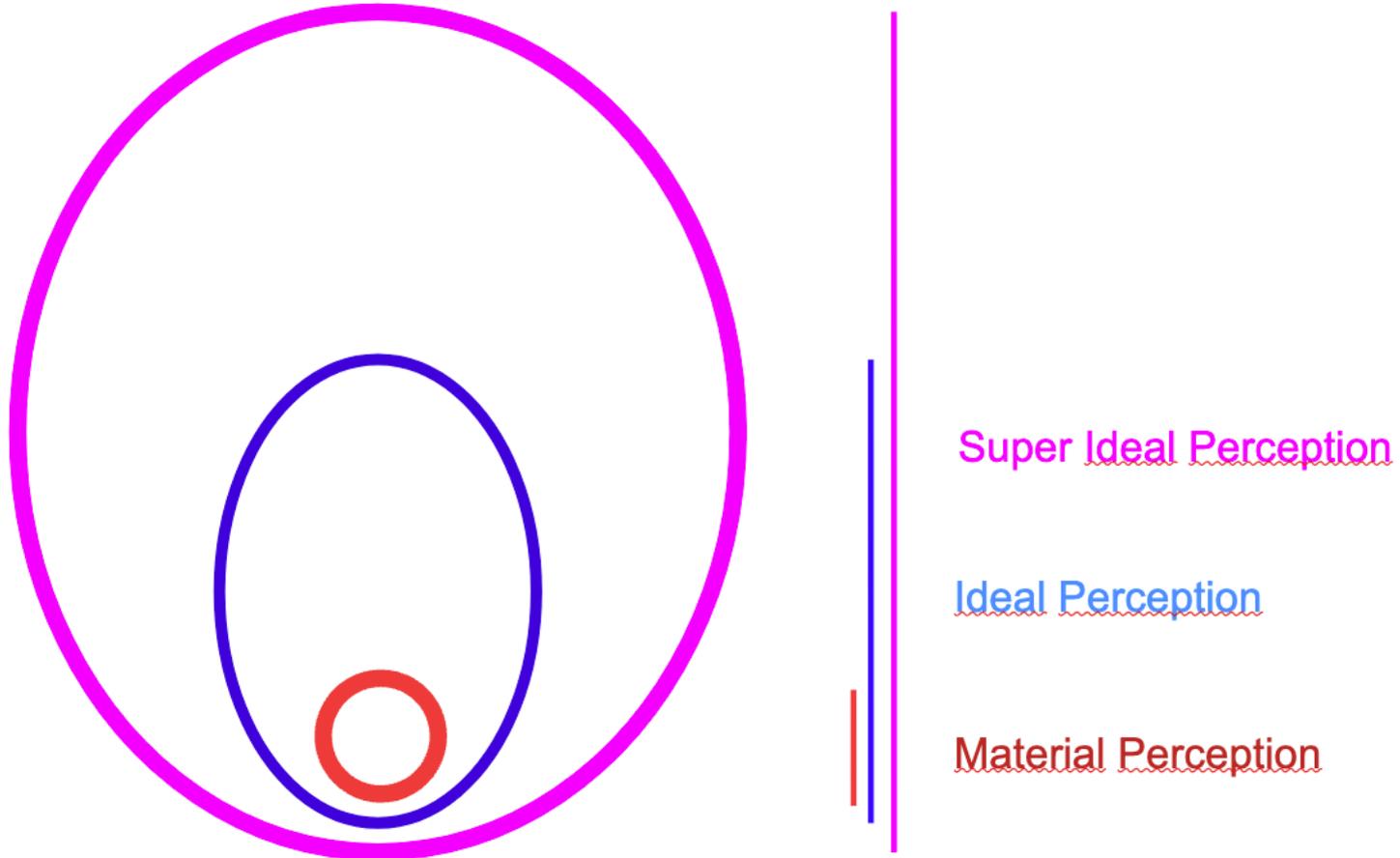


Digital Earth

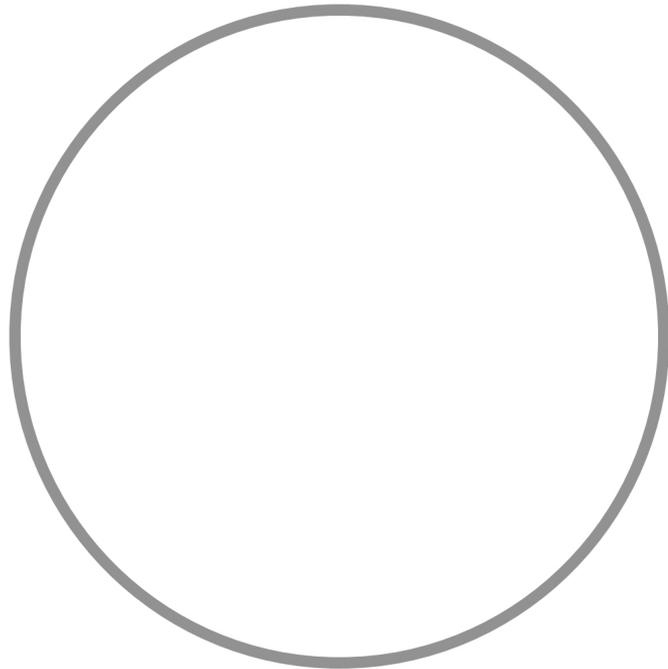
Digital Earth and Semiotics



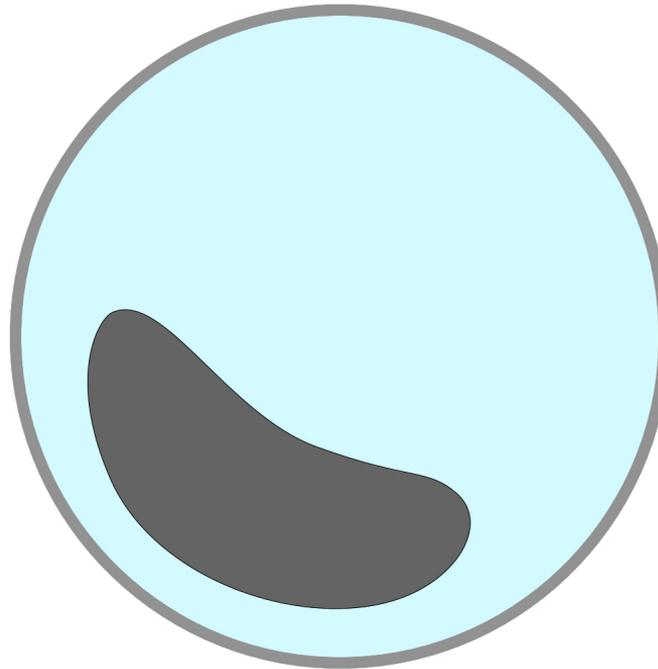
Digital Earth and Semiotics



Digital Twin



Digital Earth



Real Earth



Earth Digital Twin

Semiotic-based Digital Twin

Conclusions

1. Digital Earth is a heterogeneous spatio-temporal information system that uses a precise representation of geocontext, not mediated by signs, as its main content and entities mediated by signs as an additional one. Its incredible capabilities are achieved through an optimal balance of both components. The paradox of Digital Earth is that it is digital in the way it is created, but non-digital in the way it is perceived by the user.

Conclusions

2. The Digital Earth has become a civilizational turning point—for the first time in history, an information system has been created that combines extreme precision and abundant geo-context with unsigned perception. In a sense, humanity is returning to its roots, lost in the past, but at a new technological level.

Conclusions

3. Unlocking the hidden potential of the Digital Earth is becoming possible through the practical application of its unsigned potential—specifically, by processing remote sensing data before, rather than after, digitization. This direction in developing the Digital Earth's hidden potential for the benefit of sustainable human development is becoming an important factor in enhancing its inexhaustible heuristic capabilities.

Thank you!

End of Lecture 19.1