Space OS

An Spatial Operating System for the Intelligent Edge

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Presentation Outline

A new spatial computing operating system that has first class support for mobile ad hoc systems developed using JAMScript.

Distributed AI for Mobile Ad Hoc Clouds

SDN Adopted for MaDoC
Create resilient control-plane that can handle disconnections & mobility

ML-Driven Data Processing
Use ML models of data-intensive application tasks and map them to MaDoCs

Distributed ML
Develop distributed ML algorithms that would in MaDoCs

Space OS Concept

Edge Computing
Compute servers dispersed into the space and available for use from mobile nodes

Mobile Ad Hoc Nets
Mobile ad hoc networks that are able to connect mobile and stationary nodes into opportunistic compute clusters

Representing Space
Space representation based on accurate localization both indoors and outdoors

Space OS Concept: Another View

Space as Contexts
Nodes find each other using spaces and spaces and augment and restrict the interactions of the nodes

Space for Data Storage
Information exchanged via spaces (e.g., tuple spaces) which creates new data exchange possibilities based on node movements

Space for Intelligent Behaviour
Intelligence attached to spaces such that data exchanged through them leads to different behaviours in the different spaces

Space OS Concept: Different Times

- How can we use past knowledge for future anticipation?

- How can future anticipation be used to create proactive current awareness?

Space OS Vs Social OS

- Social network is an operating system that provides past knowledge, current awareness, and future anticipation for human networks at human time scales

- Space OS is a social network for machines at extremely fast time scales

Space OS Concept: Different Times

The Problem

A distributed programs (MaDoCs) react to node movements. No methodical framework for anticipation in distributed programs

The Solution—Until Now!

Use node-level anticipation (caching, pre-fetching) to accelerate processing

Your Solution

To create a space-oriented anticipation framework that works with node movements

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