learning enable efficient and rapid distillation of knowledge from data. AI systems may become integral to everyday human life by interacting with physical and biological worlds.

[0005] There's a need to apply AI technologies to the future of work and life environments through the development and deployment of AI-powered infrastructures.

SUMMARY

[0005a] According to an aspect, the present disclosure refers to a system for providing an enclosure with intelligent computing capabilities, the system comprising: a physical sphere including physical spatial elements and temporal elements associated with the enclosure; a fusion system comprising:a foreplane including physical fabric, a perceptor subsystem, and an actuator subsystem, and a backplane including a communication infrastructure, computing and storage infrastructure, power infrastructure, redundancy, and cloud connections; and a digital sphere including an artificial intelligence ("AI") system coupled to the physical sphere by the fusion system, the AI system comprising: a subsystem of observation configured to receive data from the perceptor subsystem, the data corresponding to the physical spatial elements and the temporal elements, a subsystem of thinking configured to maintain a semantic space that corresponds to a type of the enclosure, the semantic space having been provided to the subsystem of thinking and comprising a semantic ontology specific to the type of the enclosure, the subsystem of thinking being configured to learn from, model, and determine a state of the enclosure based on the received data and the semantic ontology specific to the type of the enclosure, and a subsystem of activity configured to generate decisions with the actuator subsystem based on the state of the enclosure according to a predetermined objective for the enclosure.

[0006] In an example, the present disclosure provides a system, apparatus, and methods for converting physical enclosures or enclosed spaces into intelligent computing systems. According to one embodiment, the system may comprise a physical sphere, a digital

CLAIMS

What is claimed is:

1. A system for providing an enclosure with intelligent computing capabilities, the system comprising:

a physical sphere including physical spatial elements and temporal elements associated with the enclosure;

a fusion system comprising:

a foreplane including physical fabric, a perceptor subsystem, and an actuator subsystem, and

a backplane including a communication infrastructure, computing and storage infrastructure, power infrastructure, redundancy, and cloud connections; and

a digital sphere including an artificial intelligence ("AI") system coupled to the physical sphere by the fusion system, the AI system comprising:

a subsystem of observation configured to receive data from the perceptor subsystem, the data corresponding to the physical spatial elements and the temporal elements,

a subsystem of thinking configured to maintain a semantic space that corresponds to a type of the enclosure, the semantic space having been provided to the subsystem of thinking and comprising a semantic ontology specific to the type of the enclosure, the subsystem of thinking being configured to learn from, model, and determine a state of the enclosure based on the received data and the semantic ontology specific to the type of the enclosure, and

a subsystem of activity configured to generate decisions with the actuator subsystem based on the state of the enclosure according to a predetermined objective for the enclosure.

2. The intelligent enclosure system of claim 1 wherein the perceptor subsystem comprises one or more devices that include one or more sensors, on-sensor computing silicon, and embedded software.

3. The intelligent enclosure system of claim 1 wherein the perceptor subsystem comprises at least one of optical, auditory, motion, heat, humidity, and smell sensors.

4. The intelligent enclosure system of claim 1 wherein the perceptor subsystem comprises at least one of phone, camera, robotic, drones, and haptic devices.

5. The intelligent enclosure system of claim 1 wherein the perceptor subsystem comprises medical equipment that assesses a state of health for biological actors within the enclosure.

6. The intelligent enclosure system of claim 1 wherein the subsystem of thinking is further configured to model the received data according to a domain theme.

7. The intelligent enclosure system of claim 6 wherein the domain theme includes at least one of a retail floor, school, hospital, legal office, trading floor, and hotel.

8. The intelligent enclosure system of claim 6 further comprises an enclosed physical space that serves a defined social economical purpose.

9. The intelligent enclosure system of claim 6 wherein the generated decisions include tasks to achieve functions according to the domain theme.

10. The intelligent enclosure system of claim 1 wherein the subsystem of thinking is further configured to build a model of the physical sphere, wherein the model includes a description of a semantic space and ongoing actions of the physical sphere.

11. The intelligent enclosure system of claim 10 wherein the AI system is configured to train the model by learning relationships and responses to satisfy given goals or objectives based on a domain theme.

12. The intelligent enclosure system of claim 11 wherein the AI system is further configured to calibrate the learned relationships based on configurations including at least one of settings, preferences, policies, rules, and laws.

13. The intelligent enclosure system of claim 10 wherein the subsystem of thinking is further configured to use domain-specific deep-learning algorithms and overall life-long learning to improve the model.

14. The intelligent enclosure system of claim 1 wherein the state of the enclosure comprises a combination of the physical spatial elements and the temporal elements that is monitored by the AI system.

15. The intelligent enclosure system of claim 1 wherein the backplane is spatial-aware and the communication infrastructure, computing and storage infrastructure, power infrastructure, redundancy, and cloud connections of the backplane are tagged with spatial-signatures that prohibit tampering.

16. The intelligent enclosure system of claim 15 wherein the backplane performs computation operations that ensure information is contained within the physical enclosure.

17. The intelligent enclosure system of claim 1 wherein the physical spatial elements comprise features associated with a geometry of the enclosure including separating structures, an interior and exterior of the enclosure, objects, actors, and environment.

18. The intelligent enclosure system of claim 1 wherein the temporal elements include factors related to time, events, and environmental changes.

19. The intelligent enclosure system of claim 1 wherein the subsystem of activity is further configured to use the actuator subsystem to induce changes in the physical sphere based on the generated decisions.

20. The intelligent enclosure system of claim 1 wherein the actuator subsystem comprises digital controls for equipment, appliance, mechanical, and perimeter objects.