ROMANUS: Dynamic Neural Architectures for Autonomous Systems

Tech ID: 34078 / UC Case 2023-713-0

BRIEF DESCRIPTION

ROMANUS is a cutting-edge methodology designed to enhance the performance and robustness of latency-critical, real-time intelligent systems through dynamic neural architectures.

FULL DESCRIPTION

ROMANUS introduces a novel approach for designing and deploying multi-sensor autonomous systems, such as autonomous vehicles (AVs) and unmanned aerial vehicles (UAVs), with an emphasis on dynamic neural network architectures. It uniquely adapts to various operational modes to optimize efficiency and robustness, outperforming existing methods in autonomous systems by improving performance, energy efficiency, and prediction quality.

SUGGESTED USES

- Design and development of autonomous vehicles
- Enhancements in AR/VR systems for tech giants
- Deployment in critical applications in transportation and defense
- General technology advancements in AI and autonomous systems across various sectors

ADVANTAGES

- Superior performance, energy efficiency, and robustness in autonomous systems.
- Innovative multi-branch design for optimizing multi-sensor system operations.
- Adaptive operational modes for diverse contexts and deployment conditions.
- Efficient task offloading by understanding and adapting to the deployment environment.
- Lightweight capture of spatiotemporal correlations to adapt operational modes and execution branches.
- Low-overhead monitoring of deployment conditions and processing branch performance.

PATENT STATUS

Patent Pending

RELATED MATERIALS

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OTHER INFORMATION

CATEGORIZED AS

- **Security and Defense**
  - Other
- **Transportation**
  - Aerospace
  - Automotive
- **Engineering**
  - Robotics and Automation

RELATED CASES

2023-713-0

» Odema, M., Chen, L., et al. Al Faruque, M. (2022). Testudo: Collaborative Intelligence for Latency-Critical Autonomous Systems. IEEE TCAD. 42 (6).

» Chen, L., Odema, M., et al. Al Faruque, M. (2022). Romanus: Robust Task Offloading in Modular Multi-Sensor Autonomous Driving Systems. 2022 IEEE/ACM ICCAD.

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