Green Computing and DX

R&D Project Title : Development of Ultra-Low Power Material-Based AI Edge System

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Summary:

We will achieve a paradigm shift in next-generation AI systems by integrating nanomaterials science, integrated circuits, and information science. So far, the principal investigator has introduced redox reactions as chemical dynamics and extended charge information and then developed a material reservoir. Based on the results, nanomaterials with CMOS integrated circuits to build a foundation for more efficient AI hardware. Furthermore, we aim to develop a highly efficient AI system dominated by edge terminals that learn in response to their environment and perform unique computations.

Target

Connection between material reservoir and CMOS = Highly efficiency AI system

- Power efficiency 100 times (10,000 TOPS/W) of current CMOS reservoir chips!
- Robot mountable device fabrica
- Modeling and Circuit fabrication
- Achievement of energy-saving AI systems (voice, tactile, and video recognition)

Systemize Robot aplication

PET bottle!

Edge AI Robot Haptic product recognition

CMOS Modeling   CMOS Connection   Development of nonvolatile memory devices

Random Network Reservoir with Dynamics