

# Innovative device technologies to achieve ultra- high level information processing in the age of trillion sensors (TSensors)

**R&D Project Title (Registered):**

**Innovation of Photoelectric Technologies using Spintronics**

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## Summary :

Information and communication technology plays a critical role in realizing Society 5.0. The development of high-speed, wide-bandwidth, and low-power devices is all the more urgent to achieve sustainable information processing systems.

In high-end information processing systems such as switches and routers in large-scale data centers, I/O bottleneck has become a central challenge, awaiting the creation of ultra-fast and ultra-low power photoelectric devices. Specifically, the long electrical interconnects and the integration-limit of CMOS circuits hinder the simultaneous realization of high-speed performance and low-power consumption. To overcome this difficulty, we develop innovative photoelectric technologies, intermediating electrical signals and optical signals by spintronics to achieve a highly functional I/O device.

