**Title: A Method for Maximizing Performance and Minimizing Power Consumption in Embedded Peripherals**

**Technology Number:** 15066

**Technology Manager:** Casey Boutwell

*Optimization of power consumption by embedded peripherals*

**Abstract:**

The overall cost of an embedded system can be reduced significantly by minimizing its power requirements and maximizing its performance. Typically peripheral power control is static which does not cater to fine –grained intra-operation performance details. Dynamic Voltage Frequency Scaling (DVFS) is implemented in systems where performance is of paramount concern. However, this approach often does not cater to the optimum power management of peripheral devices. DVFS also presents issues in operating voltage, frequency scaling latencies, and reliability during voltage or frequency transitions.

Researchers at NC State University address this issue by proposing a novel method for maximizing performance and minimizing the power consumption in embedded peripherals. Their invention focuses on reducing the power consumption of peripheral devices by dynamically modulating supply voltage as they perform specified operations. This method is designed to have minimal impact on CPU utilization through the use of Peripheral Power Profiles (PPP) which assign an ideal voltage on a per- state basis. Low cost systems would benefit from this technology as the average load on the system would decrease, allowing power-failure circuits to use decreased charge-storage devices in order to recover from power failures.

**Advantages:**

* This method has demonstrated up to 40% energy savings on common peripherals.
* Increase in battery life in battery operated systems.
* Decrease in overall heating of the system.

**About the inventors:**

Dr. Alexander G. Dean is an Associate Professor at NC State University. His primary research interests include Computer Architecture and Systems (Including Embedded Computer Systems, Microprocessor Architecture, Software and Optimizing Compilers)

Daniel R. Moore is pursuing his PhD under the guidance of Dr. Alexander Dean at NC State University.

