



➤ Goal :

Scale operating voltage to $< 300\text{mV}$ to reduce power consumption (Ultra Low Power operation) of conventional signal processor electronics by $> 10\text{X}$ while maintaining comparable throughput

➤ Technical Challenges:

- ✓ Performance degradation at reduced voltage
- ✓ Increased circuit variability and error rate for low voltage operation
- ✓ Reduce leakage current of deep sub-micron devices to reduce power consumption

➤ Technical Approach

- ✓ Develop and characterize ULP devices for optimum performance in sub-threshold operation
- ✓ Implement strategies to minimize reliability and performance degradation for ULP circuits
- ✓ Explore methods to increase computational throughput with massive parallelism

➤ Military Impact

- ✓ Extended operation wireless sensor networks
- ✓ Lower power, man portable comm systems

➤ Performer:

- ✓ MIT/Texas Instruments

➤ Deliverables

- ✓ Device technology capable of ULP operation
- ✓ Circuits able to operate reliably at $< 300\text{mV}$
- ✓ Design techniques to provide processing throughput comparable to conventional electronics operating at standard voltage