

# A Scalable Ultra-Low Power Temperature Gradient Sensor using Pulse Coupled Oscillators

**CNF Project Number: 2121-12**

**Principal Investigator(s): Alyssa Apsel**

**User(s): Kyubum Shim, Parag Chaudhari**

*Affiliation(s): Electrical and Computer Engineering Department, Cornell University*

*Primary Source(s) of Research Funding: National Science Foundation*

*Contact: aba25@cornell.edu, ks975@cornell.edu, prc79@cornell.edu*

*Primary CNF Tools Used: Wire bonder*

## Abstract:

This paper presents an ultra-low power and area-efficient temperature sensor array, capable of local temperature measurements and innate gradient detection using locally coupling oscillators. This all-CMOS system consumes approximately  $5pW$ , occupies  $0.0045mm^2$ , operates on a wide supply voltage range of 0.6V to 1.8V, and reduces computational overhead for gradient detection within scalable systems.

## Summary of Research:

Temperature sensing nodes with distributed inference mechanism to detect local temperature maxima.

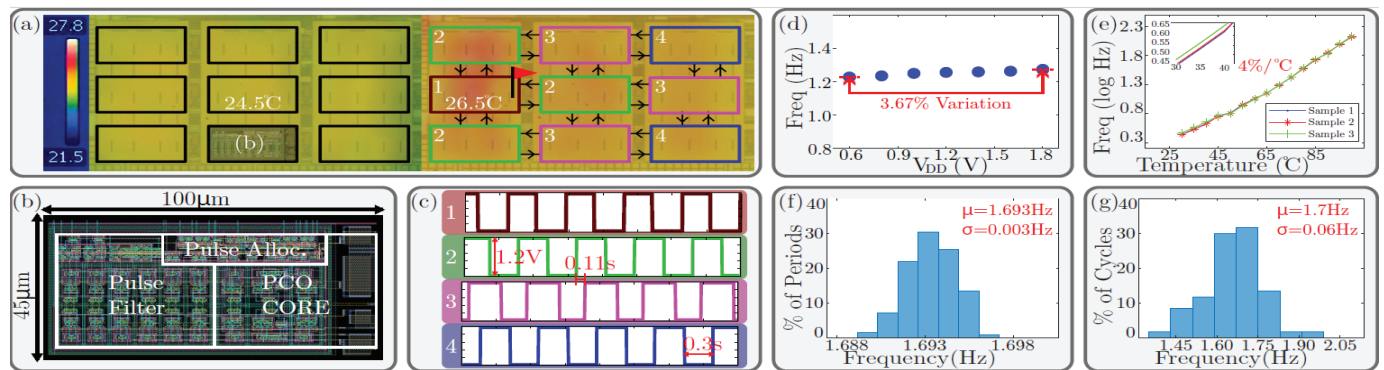


Figure 1.

