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Hybrid Flexible Electronics Integrating Rigid Integrated Circuits

In recent years, consumer demand increased for flexible electronics since they are lighter, thinner, cheaper to manufacture, and more versatile in application than traditional rigid circuits. Flexible electronics have huge market potential, but lack size and performance efficiency compared to current silicon technology. To combat the inefficiencies of flexible electronics, scientists look to use integrated circuits (compact and performance-efficient circuits) to create a hybrid structure that is able to optimally balance elasticity and performance.

Researchers at ASU have developed a theoretical basis for placing chips that retain favorable electrical and thermal properties on a flexible surface. The design has rigid circuits in the smallest bounding space with enough area for interconnects, allowing users to customize the chip's balance between performance and flexibility. The placement of the chips on the flexible substrate minimizes distance between circuits and maximizes performance.

Potential Applications

- Flexible/Wearable/Personal Electronics
- Semiconductors
- Processors

Benefits and Advantages

- Hybrid Structure – the method can efficiently and effectively balance pliability and performance
- Customizable – allows tradeoff between performance and flexibility, letting users set an optimal balance as necessary
- Innovative – the hybrid framework delves into an industry with huge market potential

For more information about the inventor(s) and their research, please see:

Dr. Umit Ogras's directory webpage