

Low-Energy computing for Autonomous Mobile Robotic CPS: A Hardware-and-Algorithms Co-design Approach

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(#1837212, Sept 2018)

Challenge:

- Computing elements for low-energy robotics.
- Design computers from the ground-up to achieve energy requirements.

Solution:

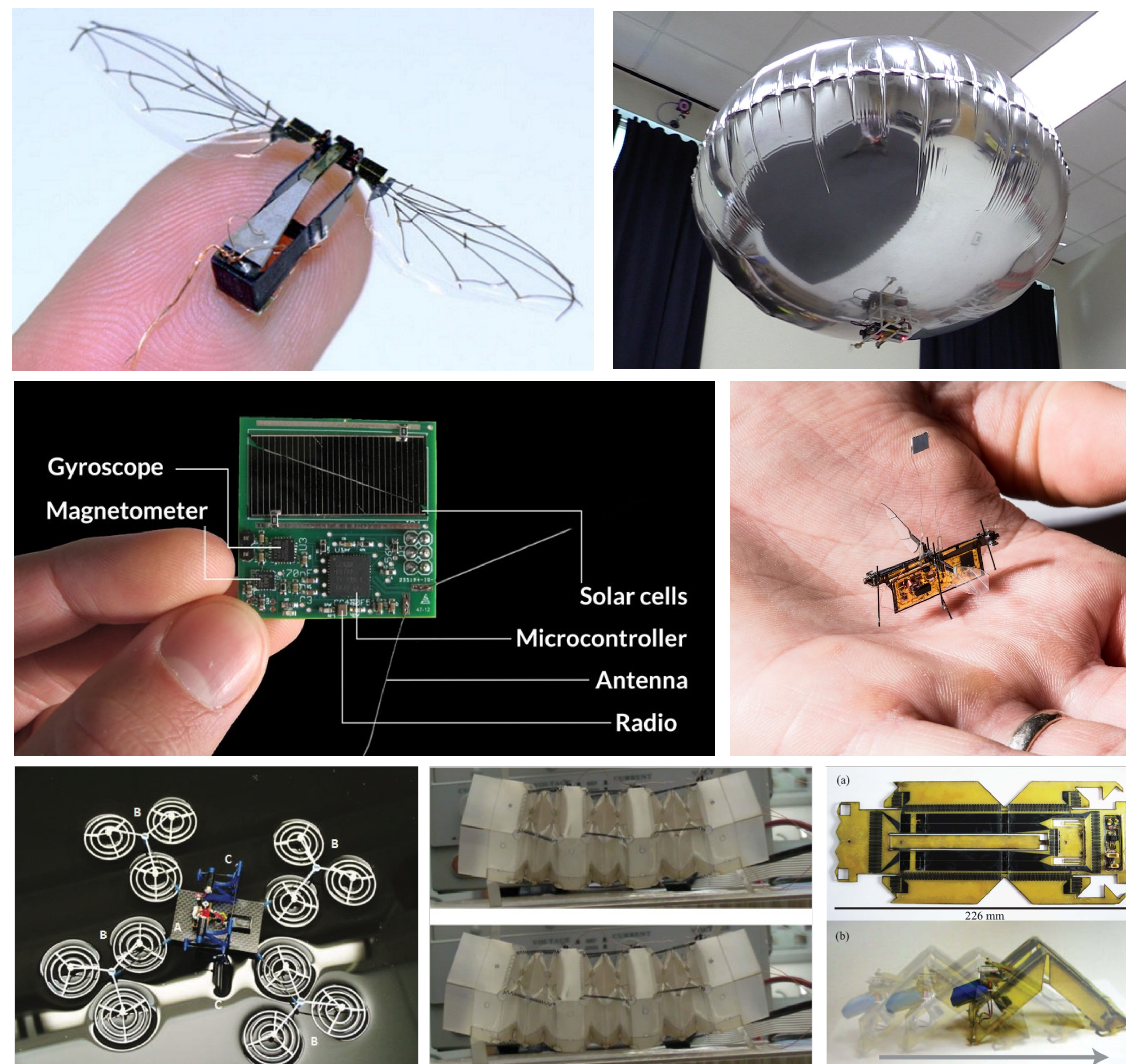
- *Co-design* of algorithms and computing hardware.
- Focus on data flow rather than, e.g., number of operations.

Scientific Impact:

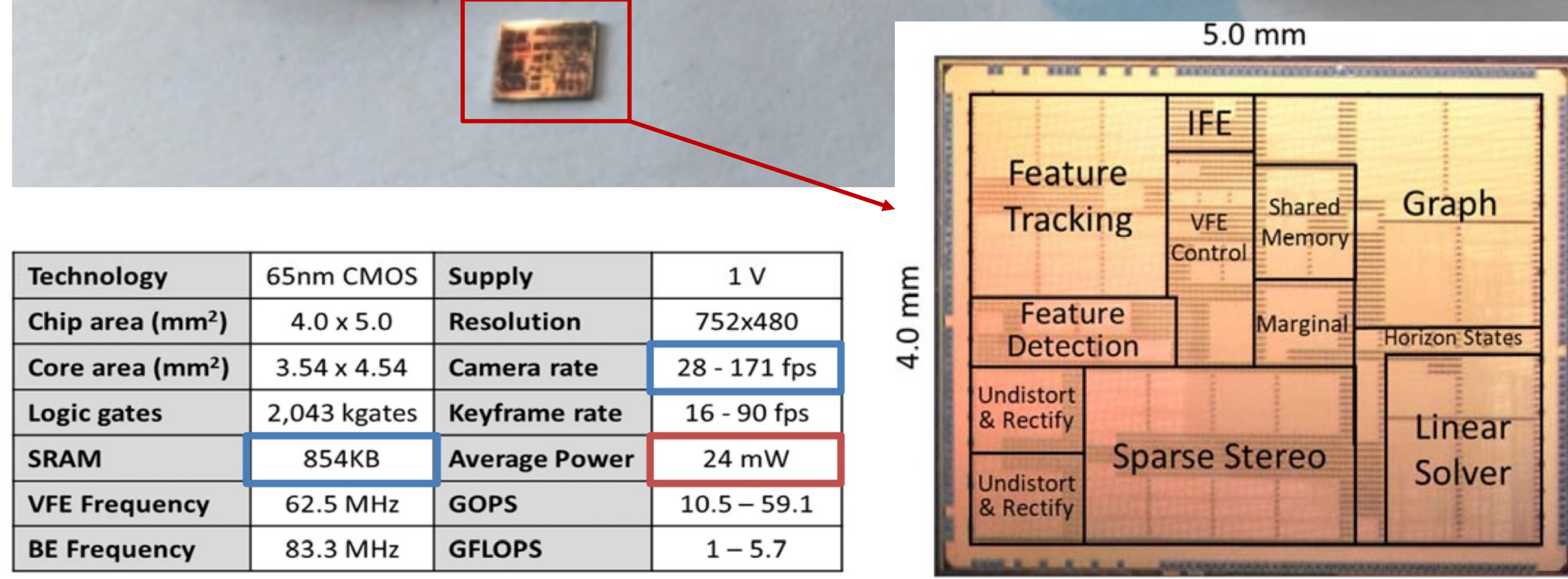
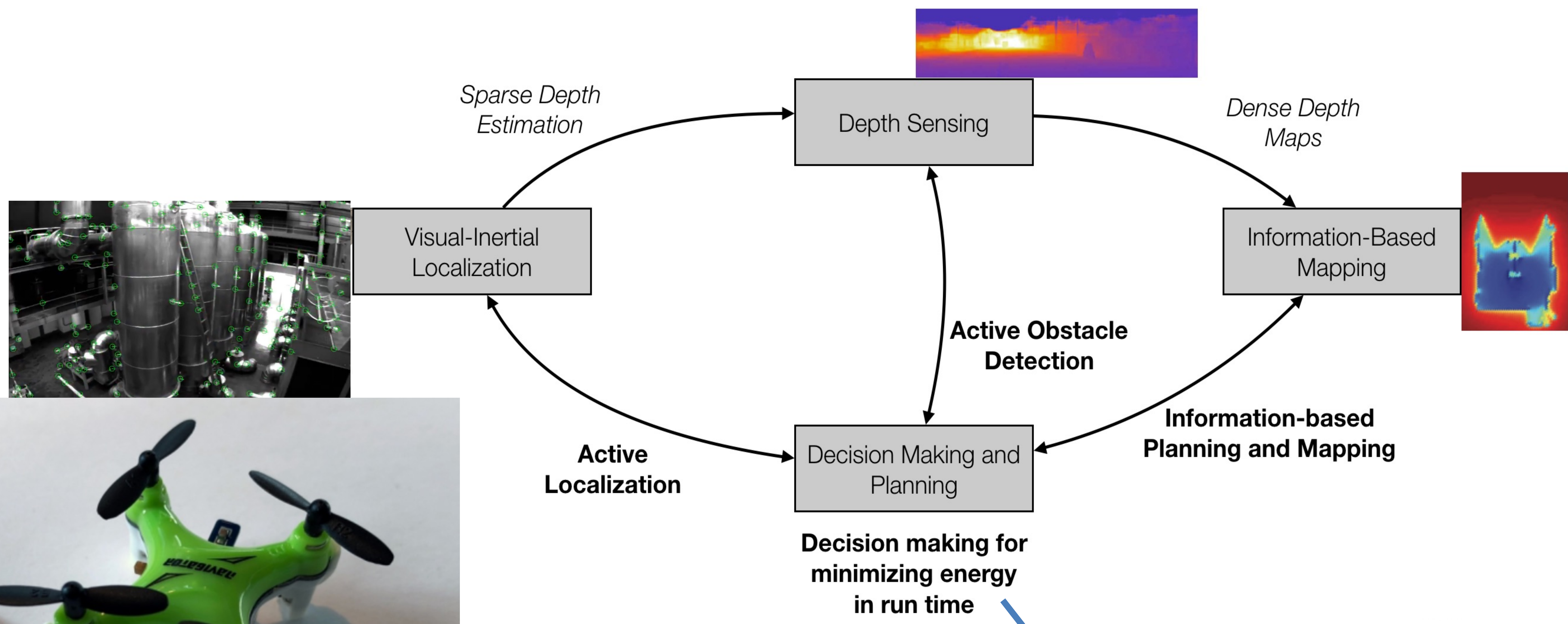
- Revisit robotics algorithms from the perspective of computing hardware.
- Recent results demonstrate three orders of energy savings in visual navigation.

Broader Impact:

- Enables miniature and/or high-endurance vehicles for
 - Environmental monitoring
 - Consumer devices
- Foster community at the intersection of robotics, integrated circuits and computer architecture.



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Start date: Sept 2018
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Estimating Compute Energy

