Overview of the Common Component Architecture

High Performance Embedded Sensor Networks

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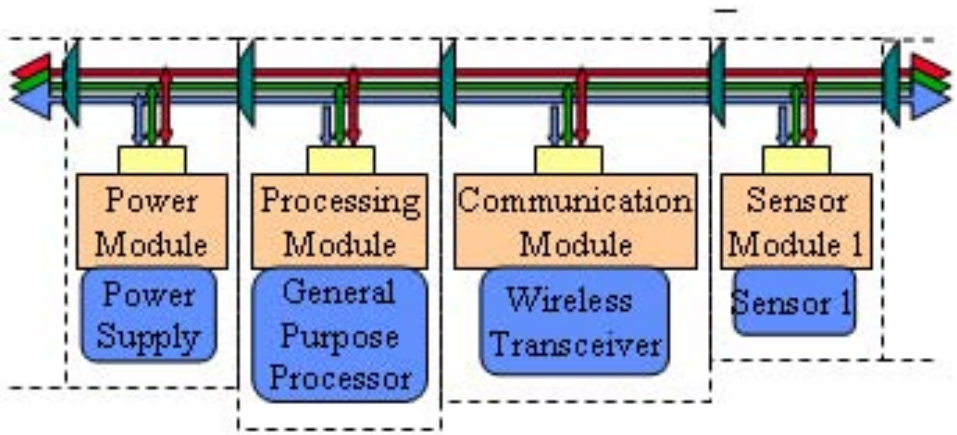
High Performance Embedded Sensor Networks: Hardware and Software Components

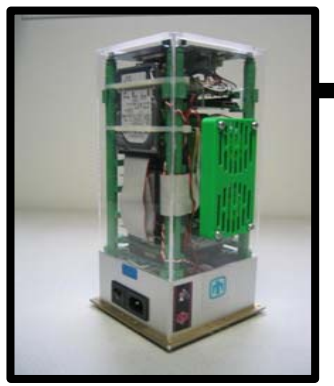
- **MASS (Modular Architecture for Sensor Systems)**

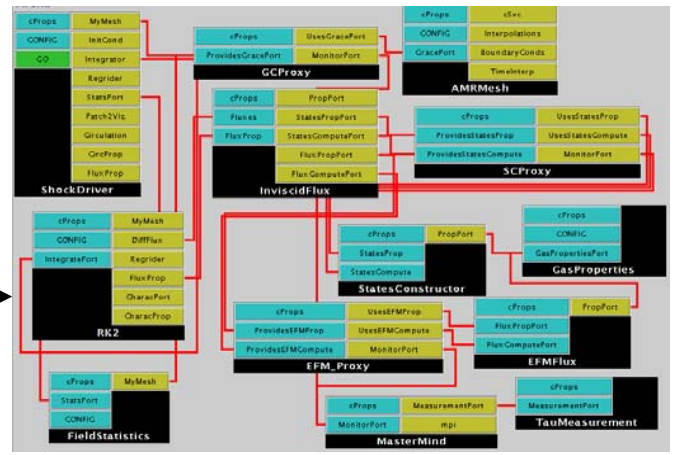
  Sensor nodes that are:
  - **pluggable,**
  - **adaptable,**
  - **and, efficient.**



- **CCA (Common Component Architecture)**

  Software components that are:
  - **pluggable,**
  - **adaptable,**
  - **and, efficient.**





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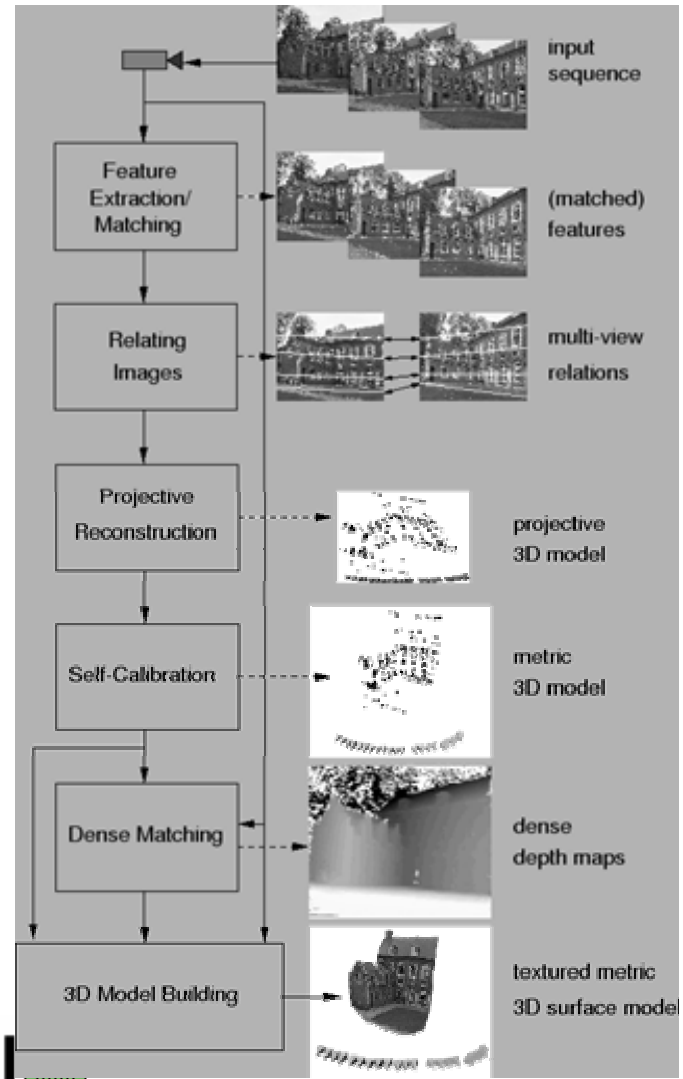
Scene Reconstruction



- **Points of parallelization**
  - **Image capture**
  - **Feature extraction on each image**
  - **Relating pairwise images**
  - **Standard Matrix Operations**

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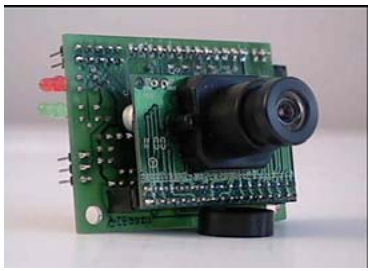
Imaging in Wireless Sensor Networks

Low-power CMOS Image Sensors

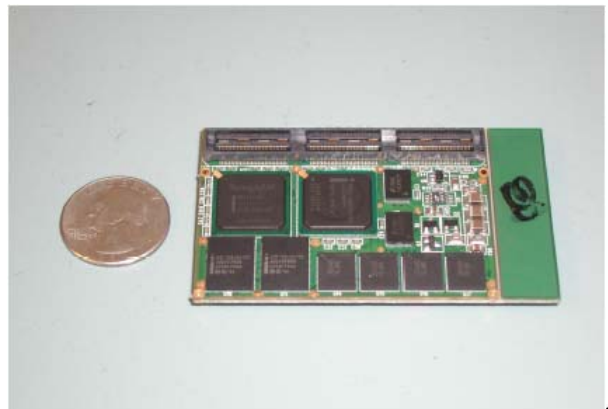


A Sample Image

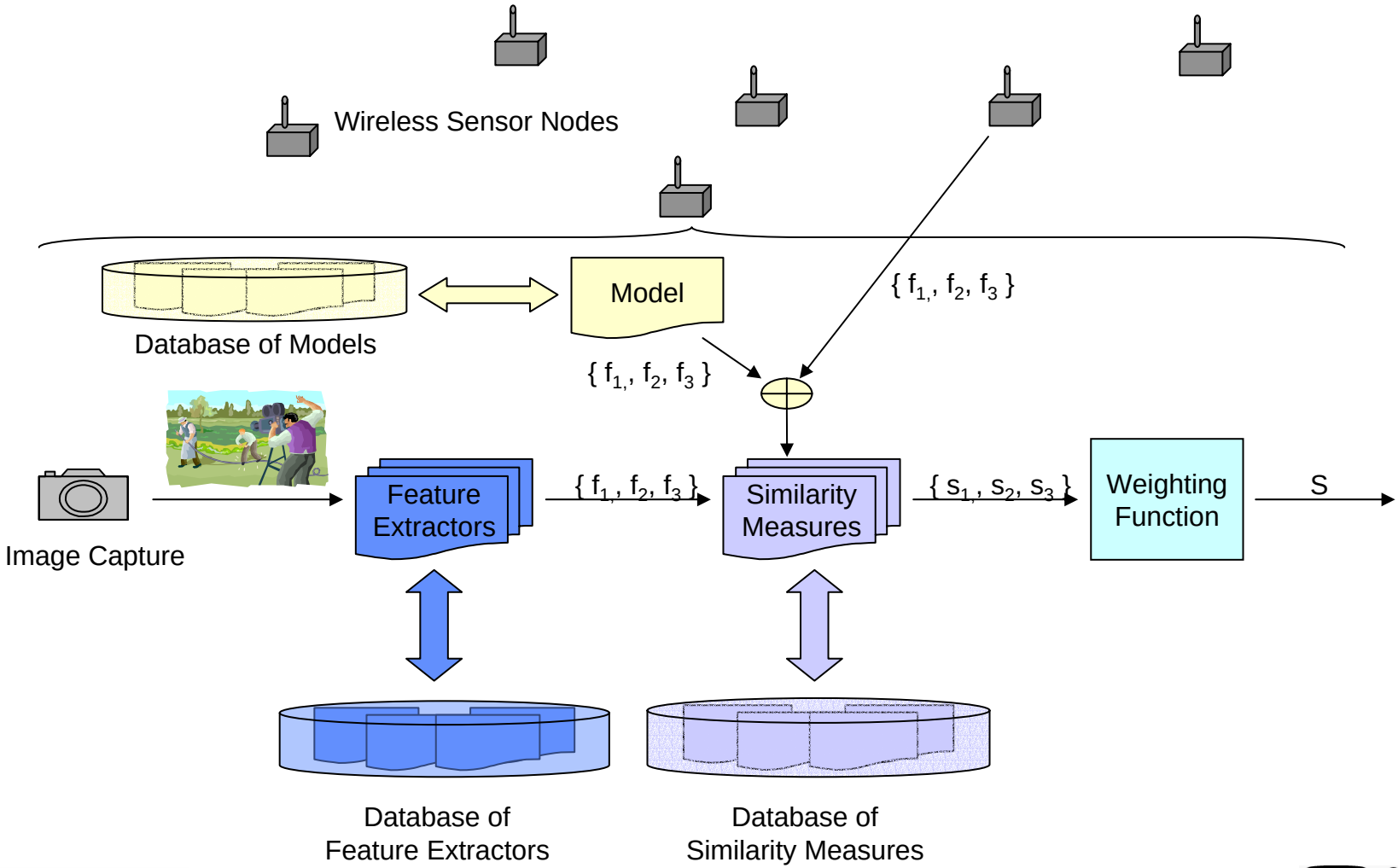
- **Total battery energy: ~ 9 J**
- **QCIF standard: 176x144 -> 25,344 bytes per image**
- **bytes in RAM < bytes in image**

	Time (ms)	Energy (J)
capture an image	67	0.002
send an event	4.3	0.0009
stream an image	2540	0.540

XScale Processor Module



Vision Framework



Background Adjustment

Background Image Acquistion

Event Acquistion

Background Update

No

Yes

Follow-up Image Acquisition

Feature Extraction