Hardware Architecture

Digital board:
- ADI BlackFin DSP @300MHz
- 64 MB SDRAM
- 32GB SD Flash storage
- Custom Linux OS

Analog board:
- 16 sensing channels with PZT
- Driving signal up to 30Vpp
- High sample rate, up to 25MSPS
- High BW amplifying chain

Environmental Energy Harvesting

- Custom energy harvester collects energy from both wind and sun:
  - Different time distribution of these environmental energy source
  - Leads to higher average environmental energy.

Environmental energy distribution

Task scheduling in harvesting WSN

Target: maximize the number of measurements the system can perform based on the amount of energy available.

- Linear regression scheduling algorithm
- Adoption of DSP’s DVFS policy to adjust performance according to energy budget

IP Addressable Nodes

- Definition of a new adaptation layer to use TCP/IP stack over IEEE 802.15.4 MAC layer
- Direct end-to-end Internet integration with multiple topology options
- 6LoWPAN standard enables the efficient use of IPv6 over low power, low data-rate wireless networks