Title
Stargate-based Acoustic Sensor Platform

Permalink
https://escholarship.org/uc/item/89t2v262

Authors
Hanbiao Wang
Kung Yao
Deborah Estrin

Publication Date
2004
**Problem Description:** High-quality data acquisition of acoustic events

**Challenges of high-quality acoustic data acquisition**

High-quality acoustic data acquisition is the first step of high-quality acoustic monitoring

Acoustic events such as bird calls in the forest have relatively low signal to noise ratio

Existing iPAQ-based platform has microphones with low sensitivity and high internal noise

**Proposed Solution:** Stargate micro-server + VXPocket 440 sound card + M53 microphone

**Architecture of acoustic sensor platform**

- Intel Stargate micro-server with wireless communication interface
  - Stargate provide decent processing and communication capabilities
- Digigram VXPocket 440 PCMCIA sound card
  - VXPocket 440 provide high resolution multi-channel A/D converter
- M53 microphones
  - M53 microphones have high sensitivity and low noise

**VXPocket 440 features**

- 2 stereo balanced MIC/line input
- 48 - 8 KHz adjustable (in 100 Hz steps) sampling rate
- 24 bits A/D converter resolution
- Type II PC bus interface
- XLR connector for microphones
- ALSA (Advanced Linux Sound Architecture) device driver and API library

**Stargate features**

- 32-bit 400 MHz Intel PXA-255 Xscale RISC processor
- SA1111 StrongARM companion chip for multiple I/O
- 32 MB of Intel StrataFlash
- 63 MB of SDRAM
- 1 type II PC Slot
- 1 Type II Compact Flash Slot
- Linux kernel 2.4.19
- 802.11 and Bluetooth wireless tools
- Form factor – 3.5” X 2.5”

**M32 Microphone features**

- 2 stereo balanced MIC/line input
- 48 - 8 KHz adjustable (in 100 Hz steps) sampling rate
- 24 bits A/D converter resolution
- Type II PC bus interface
- XLR connector for microphones
- ALSA (Advanced Linux Sound Architecture) device driver and API library