Docket #: S15-048

Analog to digital convertor optimized for efficiency

This analog to digital convertor (ADC) method improves efficiency and minimizes signal distortion by optimizing sampling rate and bit rate allocation given a prescribed bit rate. This strategy reduces memory and computational load through a more effective digital representation of the analog signal compared to existing ADC. This feature can be particularly valuable in mobile devices, wireless health monitoring systems, and implanted medical devices whose operation must run on a small battery for decades.

Applications

- **Analog to digital converters** for:
  - Digital signal processing and memory
  - Scientific instruments and implantable/wearable medical devices
  - Music recording

Advantages

- **Efficient sampling with minimal distortion** - optimized signal redundancy reduces memory and power consumption. Sampling rates can be 10-100x less than conventional methods. The less uniform the energy distribution, the more effective & efficient the conversion.

Publications

- Kipnis, Alon, Andrea J. Goldsmith, and Yonina C. Eldar. "Sub-Nyquist sampling achieves optimal rate-distortion." Information Theory Workshop (ITW), 2015

IEEE. IEEE, 2015.
- Kipnis, Alon, Andrea J. Goldsmith, and Yonina C. Eldar. "Optimal Trade-off Between Sampling Rate and Quantization Precision in Sigma-Delta A/D Conversion."

Patents

- Published Application: 20160315631
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