ECE 627: DATA CONVERTERS
SPRING 2014

Lecture times: MWF 3:00 - 3:50 pm, in Gilmore 234.
Lecturer: Gabor C. Temes, KEC 3091, temes@eecs.oregonstate.edu
Office hours: MW 1 - 2 pm, or by appointment.
Prerequisite: ECE 626.

Textbooks used:
3. Understanding Delta-Sigma Data Converters, by R. Schreier and G.C. Temes,
   IEEE Press/Wiley, 2004 (Optional)
4. Data Converters, F. Maloberti, Springer 2007 (Optional)

Web site: http://classes.engr.oregonstate.edu/eecs/spring2014/ece627/

Topics discussed:
1. The functions and applications of D/A and A/D converters.
2. Ideal DACs and ADCs: operation, specifications, metrics.
3. Converter nonidealities: offset and gain error, DNL, INL, non-monotonicity, missing codes, SNR, DR, SFDR, etc.
4. DAC architectures: decoder-type, binary, thermometer, hybrid DACs.
5. DAC circuit structures: R-string and R-ladder circuits, current-steering, charge-redistribution, hybrid, segmented DACs.
6. ADC architectures: integrating, successive-approximation and algorithmic, pipelined, time-interleaved, sub ranging and two-step, interpolating, folding and flash ADCs.
8. Operational principles of delta-sigma (D-S) DACs and ADCs.
9. Main architectures for the realization of D-S DACs and ADCs.

Planned schedule of discussions:
1. Review of data converter operation and characterization (1/2 week)
2. DAC architectures, structures, nonidealities (1 week)
3. ADC architectures, structures, nonidealities (2 weeks)
4. Oversampling data converters (6 weeks)

Midterm Examination: Friday, May 9, 3 - 3:50 pm
Final Examination: Friday, June 13, 9:30 – 11:20 am.
Grading: midterm exam 25%, project 35%, final exam 40%.