ELEN 622 (ESS)
Fall ‘13

**FINAL PROJECT PROPOSALS**

Please select your three preferred choices and give them back to me for next week. These projects can be carried out by one or preferably by a team of two students. Use 0.5µm CMOS technology or other technology if you have access to the PDK.

Project 1. Use a micro-controller for digital control of analog filters in a Buck Converter. Specs based on type III to be later defined

Reference.-

Project 2. Design a Chaos Oscillator with very low power consumption using transconductance-mode implementations. Propose a compact implementation

References.-

Project 3. Design a reconfigurable LP 5th-order active RC filter capable of implementing an elliptic approximation and an Inverse Chebyshev and also capable of changing power consumption according to the BW of the filter. BW = {1.1, 2.2, 5, 50} MHz and SFDR (dB) > 70 dB.

Reference.-

Project 4. Design a switched-capacitor or continuous-time spectrum analyzer with bandwidth from 10Hz to 1MHz.

Reference-

Project 5. Analog Adaptive Filters for Dynamic Sensor Compensation

Reference:

Project 6. Propose a sinusoidal oscillator with the maximum linearity possible and with minimum power consumption. The implementation can be done with SC or continuous-time. The THD must be higher than -85 dB the frequency range of operation should be from 1KHz to 10MHz

Reference.

Project 7. Design a Fully differential BP Active Filter with OTA based on CMOS inverters. Fo=10Mhz and Q={1, 5, 20}

Reference:
K. Komoriyama, E. Yoshida, M. Yashiki, H. Tanimoto, “ A Very Wideband Fully Balanced Active RC Polyphase Filter Based on CMOS Inverters in 0.18 um CMOS Technology” 2007 Symposium on V/LSI Circuits Digest of Technical Papers

The important dates are:

Progress Report (November 22, 2013) with discussion of the specifications, clearly define the problem, preliminary simulations and identification of the future work and a summary of the reported related publications in the literature. No more than 10 pages. This report is worth 10% of the final project. This (word document) report must have the following form:

Title
Statement of the problem.
Background, previous work.
Potential applications of your circuit provide specific examples and references.
Basic idea of your solution. Preliminary Results.
Problems to be solved in the near future.

References, a complete list of references must be included.

Final Written Report (December 9, 2013). This final (word document) report must include:

1. Title
2. An abstract
3. Introduction
4. Background and a comparative table of previous results
5. Proposed Solution
   - Conceptual idea of solution
   - Circuit Diagram and explanation
   - Design Procedure, how to determine the (W/L)’s
   - The temperature, noise and process variation effects.
6. A Comparative Table between Hand calculation and Simulation
7. Discussion of Results with other reported results and suggested improvements
8. Layout of the Circuit if time allows
9. References

Oral Presentations in Power Point Form: December 3, 5, (if needed), 2013.

Some of these projects could be submitted for fabrication before February, 2010.