Course Topics

EEE 598: Structural VLSI Analog Circuit Design Based on Symmetry

Prerequisites: EEE 433, 523, 525 (recommended) and basic knowledge in VLSI devices and analog circuits

Catalog Course Description: VLSI analog circuit design; translation, reflection, rotation and electrical symmetry circuit structures; symmetry principle and low PVT sensitivity design methodology; ratio based design and digital based analog circuit techniques; structural design of VLSI analog circuits, such as opamp, bandgap, and phase locked loop circuits. Fundamental of VLSI spatial signal processing.

Course Topics:

Symmetry Principle
Symmetry Structures in VLSI Analog Circuits

- VLSI Reflection, Translation, and rotation Symmetries
- VLSI Electrical Symmetries

Symmetry Design Methodology

- Spatial Signal Processing (SSP) and Symmetry Computing
- Symmetry Scaling and Transformations
- Symmetry for Low PVT Sensitivity VLSI Circuit Design
- Ratio Based Design and Digital Based Analog Circuit Techniques

Structural VLSI Analog Circuit Design Based on Symmetry

- VLSI Physical Design
- Opamp Circuit Design
- Bandgap Circuit Design
- Filter Circuit Design
- Parameter Tuning Circuits
- PLL Circuit Design
- Data Converter Circuits Design
- Fuzzy Logic and Neural Network Circuits