Uday Pandit Khot, Synthesis of analog circuits employing current-mode building blocks, Ph.D. Thesis, Department of Electrical Engineering, Indian Institute of Technology Bombay, 2010.

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Abstract - The circuits using current-mode building blocks have received considerable attention in many filtering and signal processing applications. Compared to their voltage-mode counterparts, the current-mode building blocks are attractive because of their wider bandwidth, higher slew rate, and lower power consumption. As a large number of op-amp based circuits with elegant realization procedures are already available, it is worthwhile to convert them into the circuits based on current-mode building blocks. The initial contribution of the thesis deals with the transformation technique for converting a class of voltage-mode analog circuits into the current-mode analog circuits without requiring any additional circuit elements and change in the circuit topology. For fabrication as integrated circuits, it is desirable to have circuit topologies with equal-valued grounded capacitors. The major contribution of the thesis is, therefore, focused towards the development of synthesis procedures for realizing analog circuits like filters, equalizers, oscillators using current-mode building blocks such as current conveyor, current feedback amplifier, four terminal floating nullor, current differencing buffered amplifier, operational transresistance amplifier, using (i) equal-valued grounded capacitors and (ii) minimal number of active and passive elements.