

Synthesis of Optical Circuits with Contradictory Optimization Objectives

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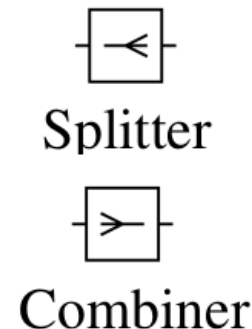
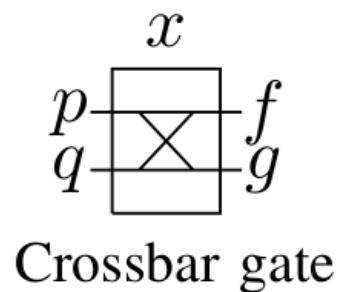
³ DFKI GmbH, Germany



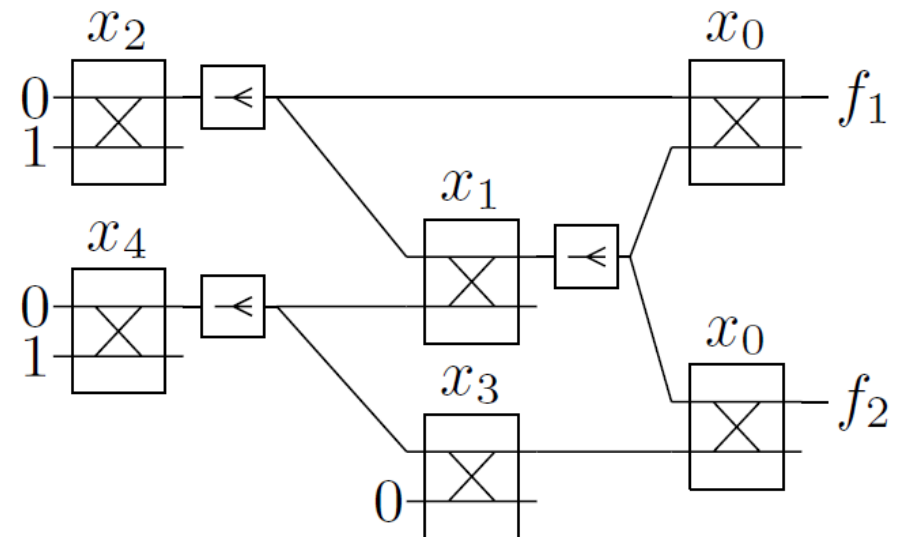
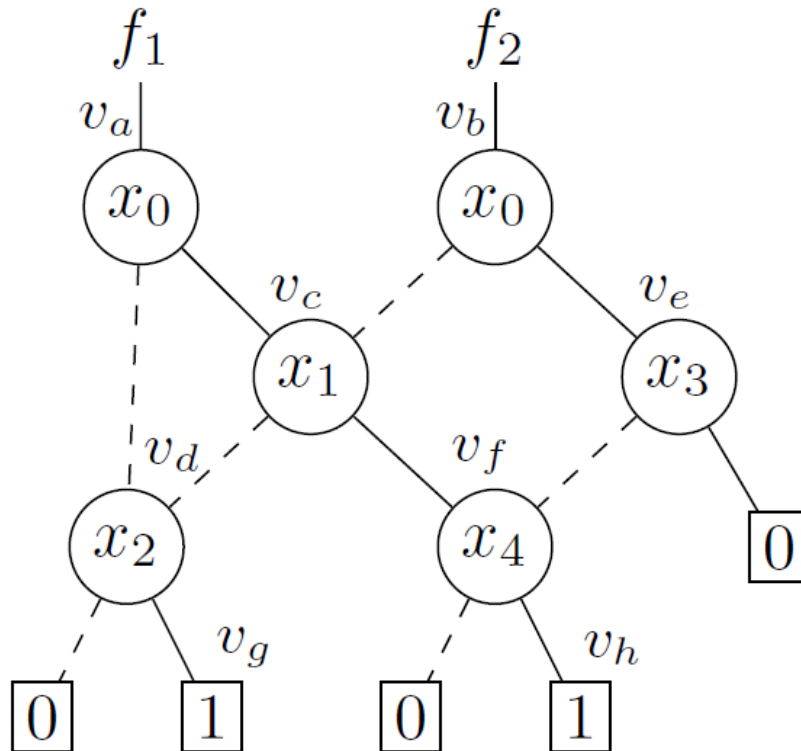
Synthesis of Optical Circuits

- Different cost metrics:
 - amount of gates
 - signal strength
 - contradictory objectives
- Functions represented by (E)SOPs, BDDs

- Gate library:

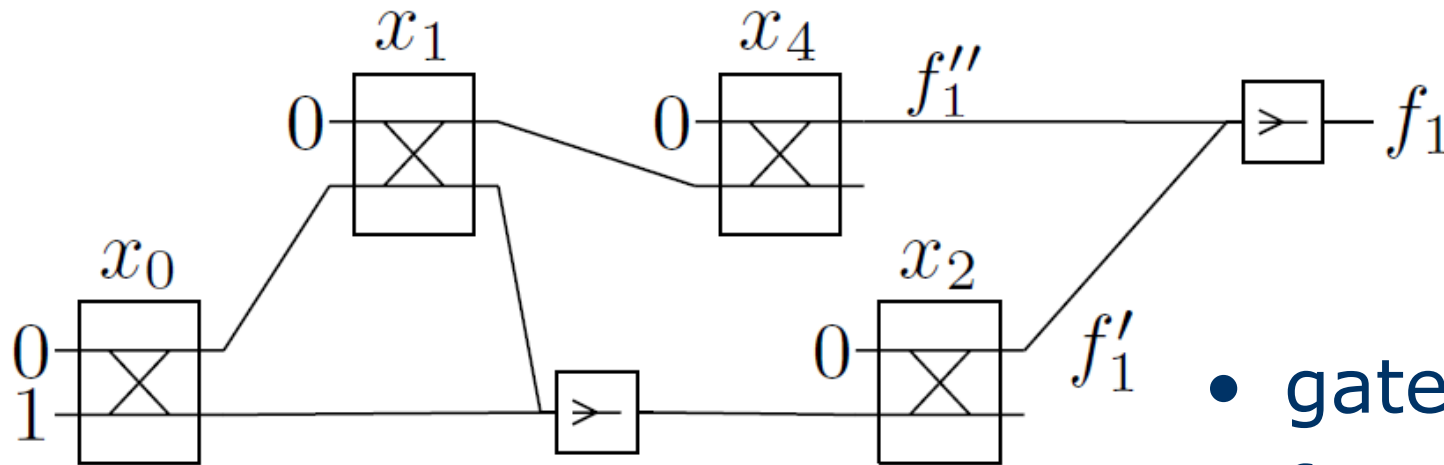


Gate-efficient Synthesis

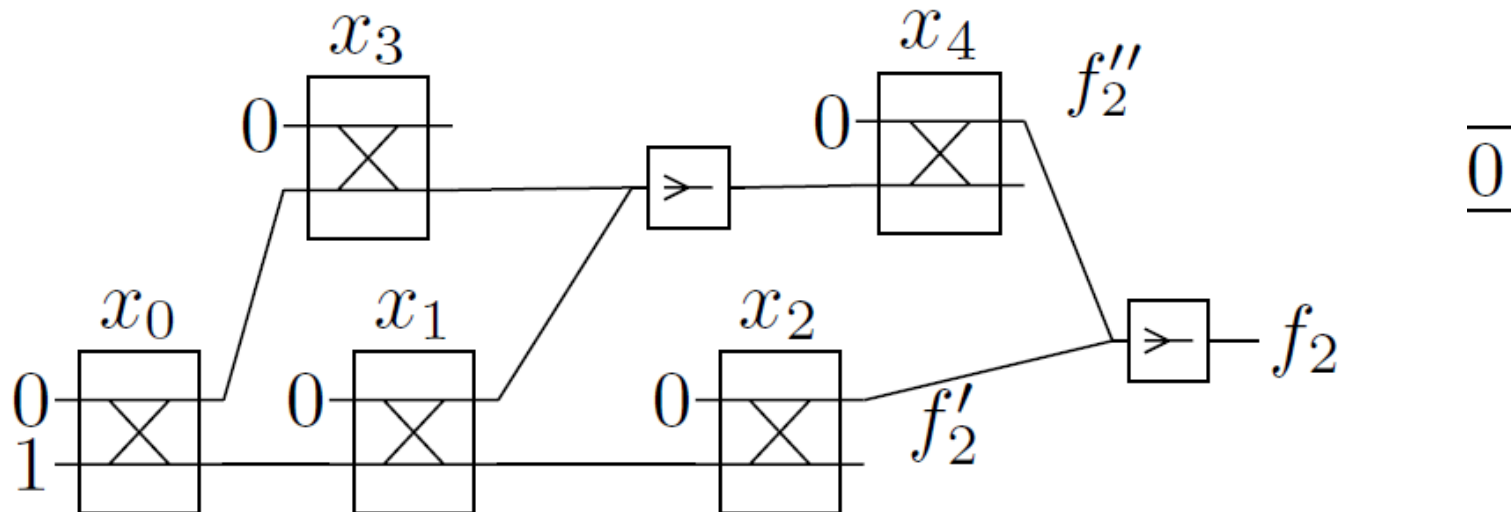


- gates: 6
- fraction: 1/4

Splitter-free Synthesis



- gates: 9
- fraction: 0



0

Results

Gate Efficient Synthesis

BDD		ESOP		SOP	
Gates	Fraction	Gates	Fraction	Gates	Fraction
< 2400	Up to 10^7	Up to 27k	Up to 10^3	Up to 35k	≤ 12

Splitter-free Synthesis

BDD		ESOP		SOP	
Gates	Overhead	Gates	Overhead	Gates	Overhead
< 3600	≤ 2.2 (1.5)	$\leq 27.5k$	≤ 2 (1.3)	$\leq 208k$	≤ 6.3 (1.6)