AN EFFICIENT GENETIC ALGORITHM FOR CHANNEL ROUTING WITH CROSSTALK CONSTRAINT

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ABSTRACT

THE INTERCONNECTION SPACING IN A VLSI CHIP BECOMES DENSER AS THE VLSI FABRICATION TECHNO -LOGY RAPIDLY EVOLVES. THIS MAKES THE EFFECT OF CROSSTALKS ON PERFORMANCE AND EVEN ON YIEL -D IN VLSI DESIGN AND MANUFACTURING INCREASE. THE INCREASE OF CROSSTALKS WILL LEAD TO CIRC -UIT DELAY,UNEXPECTED CIRCUIT BEHAVIOR AND THE DECREASE OF YIELD.CONSEQUENTLY, REDUCTION O -F CROSSTALKS BETWEEN INTERCONNECTION WIRES BECOMES MORE AND MORE IMPORTANT IN TODAY'S VLS -I DESIGN.IN THIS PAPER,WE PROPOSE A NOVEL ALGORITHM, CALLED THE GACR(GENETIC ALGORITHM CR -OSSTALK REDUCTION) ALGORITHM,FOR THE GRID-BASED CHANNEL ROUTING PROBLEMS WITH CROSSTALK C -ONSTRAINT.OUR APPROACH IS BASED ON GENETIC ALGORITHM AND HENCE THE SELECTION、CROSSOVER A -ND MUTATION OPERATORS WHICH ARE THE BASE OPERATORS OF GENETIC ALGORITHM ARE APPLIED TO GE -NERATE NEW CROSSTALK-REDUCED ROUTING SOLUTIONS.EXPERIMENTAL RESULTS SHOW THAT OUR RESULTS ARE BETTER THAN OR COMPETITIVE TO THE KNOWN BEST RESULTS.

Keywords : CROSSTALK, CHANNEL ROUTING, GENETIC ALGORITHM

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