

CADAPPLETS: Visualization of Design Automation Algorithms for VLSI Education

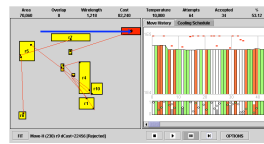
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<http://foghorn.cadlab.lafayette.edu/cadapplets>

Introduction

- ▶ Goal: provide qualitative understanding of common CAD algorithms
 - ▶ Problem formulation
 - ▶ Algorithm operation - “interesting events”
- ▶ Use applets for web distribution
- ▶ Current Focus: Physical CAD
 - ▶ Placement
 - ▶ Block placement - Iterative Improvement
 - ▶ Block placement - Simulated Annealing
 - ▶ Routing
 - ▶ Maze Routing
 - ▶ Channel Routing
 - ▶ Fundamental Algorithms: Spanning Trees, Steiner Trees

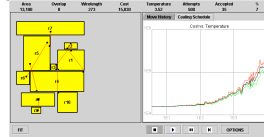
Placement Using Simulated Annealing

▶ Move History View



Displays Move Cost, Probability, Status

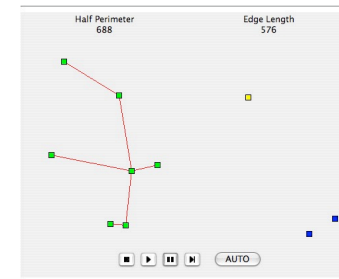
▶ Cooling Schedule View



Displays Cost vs. Temperature

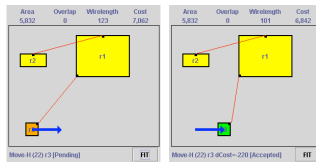
Rectilinear Minimum Spanning Tree

▶ Step-by-step animation of Prim's Algorithm



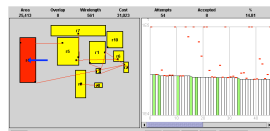
Placement Using Iterative Improvement

▶ Basic Placement View: “Rat’s Nets”



Pending Move Attempt Accepted Move Attempt

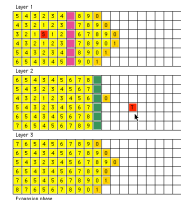
▶ Placement Using Iterative Improvement



Rejected Move Attempt Move History Display

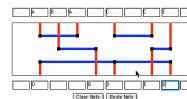
Routing

▶ Maze Routing with Lee-Moore Algorithm



Expanding Search

▶ Channel Routing with Left-Edge Algorithm



Clear Nets Draw Nets

Rectilinear Steiner Tree

- ▶ Shows Hanan Grid
- ▶ Manual addition/removal of Steiner Points
- ▶ Displays improvement over RMST

