3D Visualization of Integrated Circuits in the Electric™ VLSI Design System

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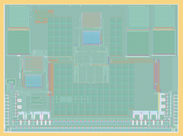
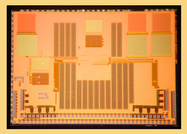
Electric VLSI Design System™

A complete chip design system

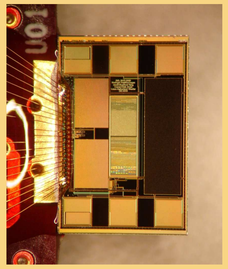
- Schematic capture, IC layout, design rule checks, simulation waveform display



Electric layout



Actual chip



Collaboration with Harvey Mudd College, CA

Fully open source written in Java

- A cross-platform framework for academic and open source collaboration
- Available for downlaod at www.staticfreesoft.com

Next-generation CAD database

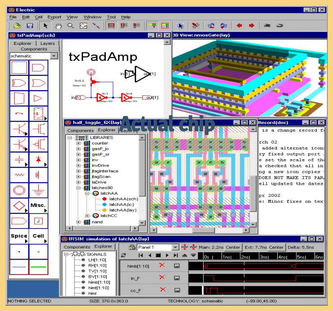
- Thread-safe database built with immutable objects
- Server/client decomposition enables cross-site collaborative design

Multi-threaded CAD algorithms

- Leverage Java's multi-threading environment to gain CAD tool performance

Advanced Visualization Capabilities

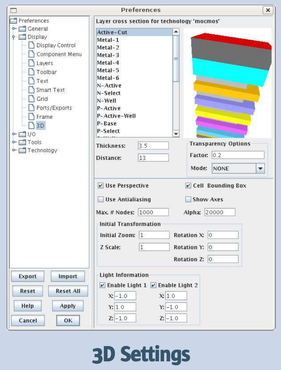
- Integrated probing facility between views
- Unique 3D view for advance design



Electric's Views

3D Visualization in Electric

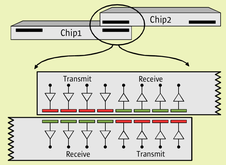
- Add-on to explore 3D visualization impacts in VLSI CAD
- Based on Java3D, an open source Java interface for interactive 3D graphics
- Transparency and different blending options available
- Takes advantages of the scene-graph paradigm for group visualization
- Fly-through mode based on zoom, rotation and translation behaviors



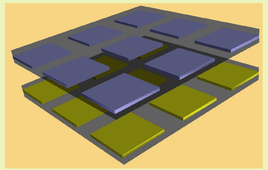
3D Settings

3D Visualization in Advance VLSI Research

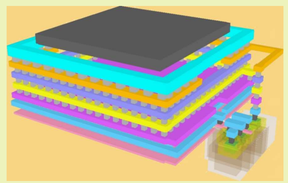
- The 3D viewer aided designers in demonstrating Proximity Communication (PxC), a wireless chip-to-chip communication technology
- Using PxC, precise measurements of chip alignments are critical and the 3D viewer aided designers in demonstrating the concepts
- The 3D viewer was fundamental in the design of a metal cage structures for fuses, areas of top-level metal that are exposed so that they can be cut with a laser
- Visual verification tool for interconnected fill signals. Fill structures are often used to carry signals, particularly power and ground, and are wired across multiple layers



Proximity Communication



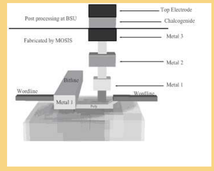
Chip to Chip Pads in 3D



Metal Cage Structure

3D Visualization in VLSI Education

- Teaching tool in CMOS technology based courses
- Unlike standard 2D views, a more realistic representation of marks to fabricate is available
- At Boise State University, Electric's 3D viewer is being used intensively for teaching
  - Programming phase change memory
  - Resistive memory sensing
  - Nano-photonic biosensor research



Collaboration with BSU