FUJITSU THE POSSIBILITIES ARE INFINITE

CAD (Computer-Aided Design)

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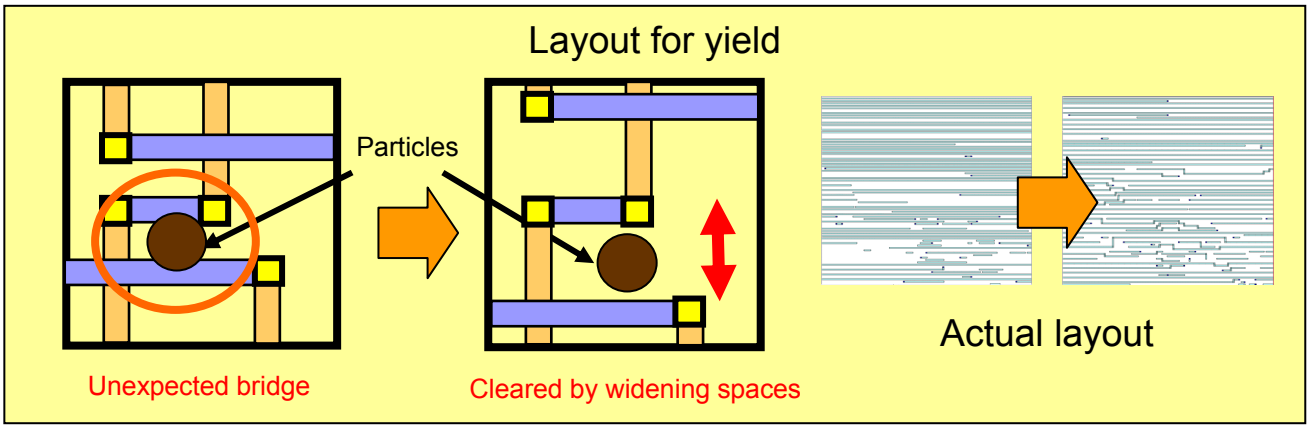
Abstract

Computer Aided Design (CAD) technology enables design efficiency in a wide variety of electronic devices and embedded systems. Today's LSIs consist of billions of transistors and the demand never ends for faster speed, lower power consumption, and increased reliability. So we promote research on CAD technologies that support and/or automate LSI designs because it is becoming increasingly more difficult for humans to adequately understand and design operations for these complex and sophisticated LSIs.

Technology

- **System-level design and verification technologies/methodologies**
  Our research focuses on the content and usage of specification, a foundation of LSI design, in order to improve it's quality and to detect errors at an early stage of design.
  We have established a systematic verification methodology starting from specification which includes:
  - Specification guidelines that define the contents of specification and the way to formalize them in UML
  - Specification verification that detects incompleteness and incompatibility in formalized specification
  - Generation of verification scenarios for implementation from the formalized specification

  By applying this methodology to a large-scale LSI, we found many errors in specification during the first 2 months of design. This turned out to be 60% of the total errors and as a result we reduced the development time by 25%.
- **Low power design technologies**
  Our major focus includes algorithm-level and system-level low power technologies. A power-aware memory architecture has been established which optimizes access to memory using characteristics of the target application software. This technology has been shown to save 40% of the cache memory power for some multimedia applications.
- **Design for manufacturing**
  Process variations in transistors and/or particles on chips heavily affect the performance and yield of today's LSIs. So we have established the technologies required to statistically analyze the effect of the variations and to reduce the impact of the particles by increasing the space between LSI wires in congested areas.



Application Examples

- All of the technologies listed here are supported by in-house design tools at Fujitsu. A number of LSIs have been designed and fabricated using them.