

Students Wanted

Interns, Masters, Doctoral, Post-Doc and Professional Researcher

(financing up to two years)

WaferBoard™ Rapid Prototyping for Electronic Systems

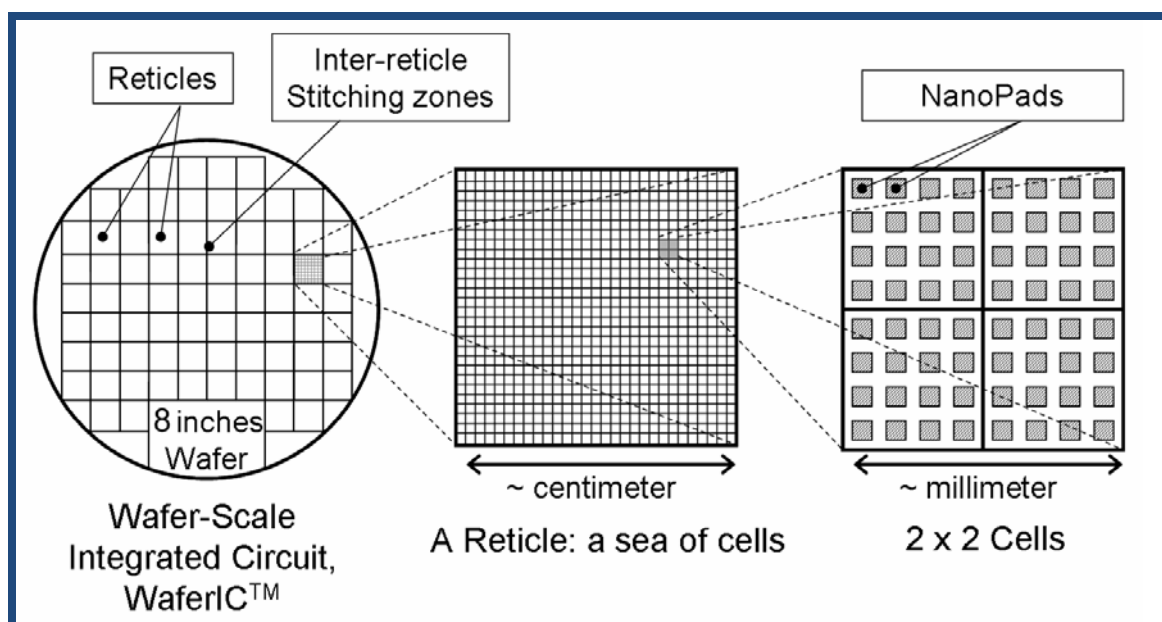
www.DreamWafer.com

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Industry and Government partners: Gestion TechnoCap Inc., DreamWafer Division, Richard Norman, CMC Microsystems, Hyperchip Inc., Natural Sciences and Engineering Research Council of Canada (NSERC), PROMPT, Precarn, Hydro-Québec Research Institute (IREQ)

Description: The WaferBoard™ is a “waffle iron” for prototyping electronic printed circuit board (PCB) systems. Simply place components (“dough”) in the WaferBoard™ and close the cover. “WaferBoard™ then senses the component contacts and recognizes the components and intelligently interconnects them (“cooks them”). The prototype (“waffle”) is now ready to be brought up and run. The WaferBoard™ will have saved the PCB development process weeks or months of time to market and tens to hundreds of thousands of dollars (or more).

The WaferBoard™ is based on a wafer-scale integrated circuit WaferIC with a defect-tolerant configurable network, WaferNet. Its surface is populated with an array of sensors (NanoPads) that can detect component contacts, (2) a sea of interconnect elements that can be set to interconnect component contacts; and (3) an intelligent control system that can press components against the surface, watch contacts being detected, map the contact pattern to components, recognize those components, read specification files, match components to the specification, adjust the specification for actual component positions, and configure the sea of interconnect elements to match the adjusted specification.

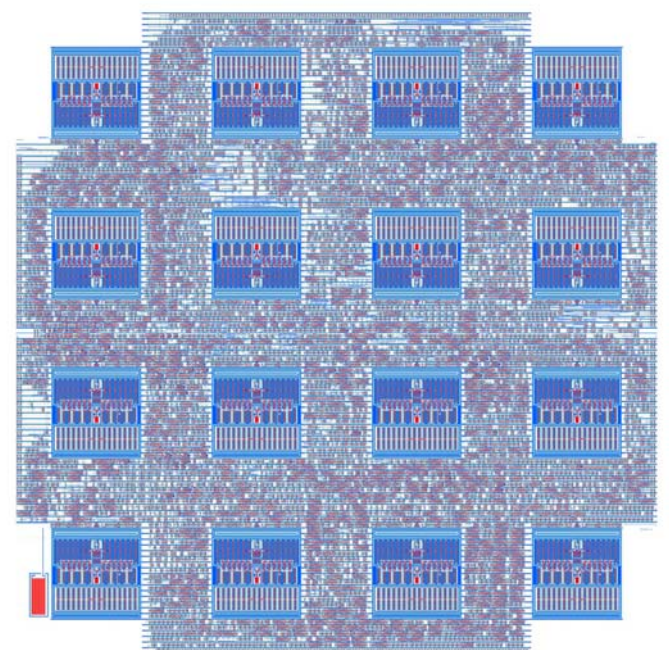


Mixed-signal circuit design of WaferIC™ (several master and post-doc positions)

- Design networks of sensors to measure physical characteristics on WaferIC™, such as temperature, signal speed, mechanical stress and physical distortion, current, and EMI
- Design of interconnects and I/O interface circuits for high-speed differential/analog signals
- Design of multi-purpose NanoPads
- WaferIC™ Physical design (layout, place-and-route, etc.)
- *Required background:* microelectronic engineering or electrical engineering

WaferBoard™ Software (several master and intern positions)

- Design of a low level data acquisition software
- Design of software for application design entry with high level AI support
- Design and implement algorithms to
 - test and diagnose defects on WaferIC™ and extract a defect map
 - detect ICs on WaferIC™
 - recognise ICs on WaferIC™
 - configure WaferIC™ and WaferNet™
 - activate actuators according to temperature and stress sensing data
- Design the WaferBoard™ configuration software
- Design instruments for application debug
- Define and create a component library
- *Required background:* software engineering or computer science (with knowledge on FPGA) or microelectronic/electrical engineering with a solid background in software



WaferBoard™ design

- Design several high-speed PCBs and flexible PCBs and deal with subcontractors
- Design, implement, assemble the WaferBoard™
- Test and diagnose WaferBoard™
- *Required background:* microelectronic engineering or electrical engineering, preferably with solid PCB design experience.

Test and verification of WaferIC™ and WaferBoard™ (intern positions)

- Design and run test regression for WaferIC™ and WaferBoard™ validation.
- Develop test structures (C++, VHDL, FPGAs) to characterize the WaferIC™ and WaferBoard™
- *Required background:* microelectronic engineering or electrical engineering

