



Call for Papers
IEEE TRANSACTIONS ON
AUTOMATION SCIENCE AND ENGINEERING
Special Issue on

IEEE

Equipment and Operations Automation in the Semiconductor Industry

Semiconductor manufacturing is generally considered to be the most complex of manufacturing processes. Reasons for this include tightly constrained production processes, reentrant process flows, expensive sophisticated equipment, variable demand, high levels of automation and an ocean of data. Yet, despite the difficulties, semiconductor manufacturing is a key industry in many industrialized nations and contributes substantially, both directly and indirectly (via business services, for example), to the global economy. With the emergence of highly automated wafer fabrication facilities (fabs), there is a compelling trend to extend the traditional automation scope to integrate with advanced decision technologies (such as Operations Research, Artificial Intelligence and Queuing Theory). While there has been much attention paid to production control and, within the last decade or so, supply chain management, a recent frontier for this integration of automation and decision is equipment automation. A deeper understanding of the internal equipment operation, coupled with a system-level perspective allowing the assessment and control of the manner in which the fab production environment interacts with tool efficiency, is needed. Additional opportunities are made available by state-of-the-art automation systems and standards that enable equipment to generate a wealth of data about their operation. Such vast quantities of data inform decision technologies to control fab operations via the automation systems. By combining equipment automation with decision and exploiting the wealth of data available, factory performance will reach new heights. The central theme of the Special Issue is on *recent progress in semiconductor equipment and operations automation*. We welcome original, significant and visionary papers describing scientific methods and technologies that improve efficiency and productivity of semiconductor manufacturing. The content could also present surveys and reviews that summarize state-of-the-art practices in this arena. Special attention will be paid to papers focusing on integrating automation with decision technologies to improve the performance of equipment and operations. Submissions of scientific results from experts in academia and industry worldwide are strongly encouraged. Topics to be covered include, but are not limited to:

- Decision technologies for equipment automation
- Design concepts for equipment and related automation
- Design for manufacturing (DFM)
- Factory modeling, analysis and performance evaluation
- Algorithms for planning, scheduling and coordination
- Wafer release and dispatch policies
- Equipment productivity improvement
- Automated material handling systems (AMHS)
- Factory/cell/equipment-level controller design
- Manufacturing execution systems (MES)
- Advanced process control (APC)
- Decision support systems (DSS)
- Yield enhancement systems and e-Diagnosis
- Data mining for yield and production improvement
- Equipment engineering systems (EES)
- Fully automated factory and remote operation center
- Mobile and wireless applications (RFID)
- Agent based intelligent systems
- Engineering chains and supply chains
- Factory of the future
- Benchmark and case studies
- Automation in 300mm prime/450mm wafer generations

Important Dates

- June 15, 2009: Paper submission deadline.
- September 15, 2009: Completion of the first round paper review.
- January 1, 2010: Completion of the second round paper review.
- March 1, 2010: Final manuscripts due.
- July 1, 2010: Tentative publication date.

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Paper Submission

All papers are to be submitted through the IEEE's **Manuscript Central** for Transactions on Automation Science and Engineering <http://mc.manuscriptcentral.com/t-ase>. Please select "Special Issue" under Manuscript Category of your submission. All manuscripts must be prepared according to the IEEE Transactions on Automation Science and Engineering publication guidelines <http://www.engr.uconn.edu/~ieeetase/>. Please address all inquiries via e-mail to james.morrison@kaist.edu.