Proposal for Special Session at IEEE CASE 2021

Goal:

The semiconductor supply chain is characterized by several factors which makes it challenging for companies to achieve a competitive advantage. First, it is a global network of in-house frontend, backend, silicon foundries and subcontractors spreading all over the world. Second, the capacity lead times go to up to one year and the industry is highly capital intensive. In addition, the semiconductor products have long lead times while their lifecycles are shorter and their production ramp-up is steeper. Finally, the semiconductor demand is difficult to forecast since the industry is one of the most volatile industries.
The semiconductor industry is facing tremendous challenges amid the Covid19 crisis. Compared to the financial crisis, Covid19 will hit the supply chains in multiple waves affecting both the supply and the demand side causing multiple bullwhip effects and ripple effects. Companies around the world are trying to be agile to face the demand and supply uncertainties caused by the pandemic.
Modeling and simulation has a considerably long tradition in semiconductor manufacturing. However, because of the better data availability, the higher computer performance, and the improved capabilities of simulation software, new opportunities for modeling and simulation arise in the near future.
In this special session, we seek to highlight major challenges in semiconductor supply chains and how to overcome them by modeling and simulation. This session focuses on important topics in the semiconductor supply chains such as production planning, supply chain planning from both strategic and operational level. We look for high-quality papers addressing various planning and control problems using different modeling and simulation paradigms.

Session Title: [Modeling and simulation for semiconductor manufacturing and semiconductor supply chains]

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Contributions:

1. "How the end-to-end semiconductor supply chain could learn lessons from machine and fab level" by Abdelgafar Ismail/Hans Ehm

2. "Multi-dimensional clearing functions for production planning in wafer fabs" by Jan Bierbüße/Lars Mönch

3. "The importance of meaningful and correct reports for deviations in supply chain planning" by Laura Roget de Aysa /Patrick Moder

4. "Plan stability and the challenge of value-add versus non-value add plan changes in the semiconductor industry" by Leon Eisenmann/Tobias Leander Welling

5. "Economy of Scale Formula in an agile world in the context of semiconductor manufacturing" by Hans Ehm/Julian Lux/Josephine Mueller/Petra Elsaesser

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