

## Chapter 6<sup>1</sup>

# A Data Mining Approach to Production Control in Dynamic Manufacturing Systems

Hyeung-Sik Min<sup>1</sup> and Yuehwern Yih<sup>2</sup>

<sup>1</sup>Sandia National Laboratories, Albuquerque, New Mexico, USA

Email: [hjmin@sandia.gov](mailto:hjmin@sandia.gov)

<sup>2</sup> School of Industrial Engineering, Purdue University, West Lafayette, Indiana, USA

Email: [yih@purdue.edu](mailto:yih@purdue.edu)

**Abstract:** This chapter presents a data mining based approach for developing production control strategies under a dynamic and complex manufacturing system. To control such complex systems, it is a challenge to determine appropriate dispatching strategies under various system conditions. Dispatching strategies are classified into two categories: a vehicle-initiated dispatching policy and a machine-initiated dispatching policy. It has been shown that no single strategy consistently dominates the rest. Both policies are important to improve the system performance, especially for the real time control of the system. Focusing on combining them under various situations for semiconductor manufacturing systems, the goal of this chapter is to develop a scheduler for the selection of dispatching rules in order to obtain desired performance given by a user for each production interval. For the proposed methodology, simulation and competitive neural network approaches are used. The test results indicate that applying our methodology to obtaining a dispatching strategy is an effective method given the complexity of semiconductor wafer fabrication systems.

**Key Words:** Data Mining, Production control, Dispatching rules, Scheduling, Semiconductor wafer fabrication.

---

<sup>1</sup> Liao, T.W. and E. Triantaphyllou, (Eds.), **Recent Advances in Data Mining of Enterprise Data**, *World Scientific*, Singapore, pp. 287-321, 2007.