2015 STARS Presentation
Abstract

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Research in the Scheduling of Production

In this presentation I will provide an overview several new developments in the theory of production scheduling. I will provide a short summary of my work in solving scheduling problems when the objective is to minimize total weighted tardiness. I will show why the work is important and where it has applicability. The work involves determining a priori precedence between pairs of jobs. Given such precedence relations, the time and effort in searching for an optimum solution can be greatly reduced.

I have developed a number of theorems for determining such precedence relations. The theorems are applicable when there is a single facility with a finite set of jobs to be scheduled. For each job we know the required processing time in the system, the due date that the customer desires, and the tardiness penalty rate for each unit of time that the job is tardy. I show the extent to which the use of the theorems simplifies the scheduling process.

Scheduling for minimum tardiness is a universally important objective in any business enterprise. Improved scheduling methods have a direct bearing on the efficiency of the production function and thus have a direct bearing on national well-being. The work here has been supported in part by the German Alexander von Humboldt Foundation. During 2015 I will be continuing this line of research with partners at the University of Augsburg.