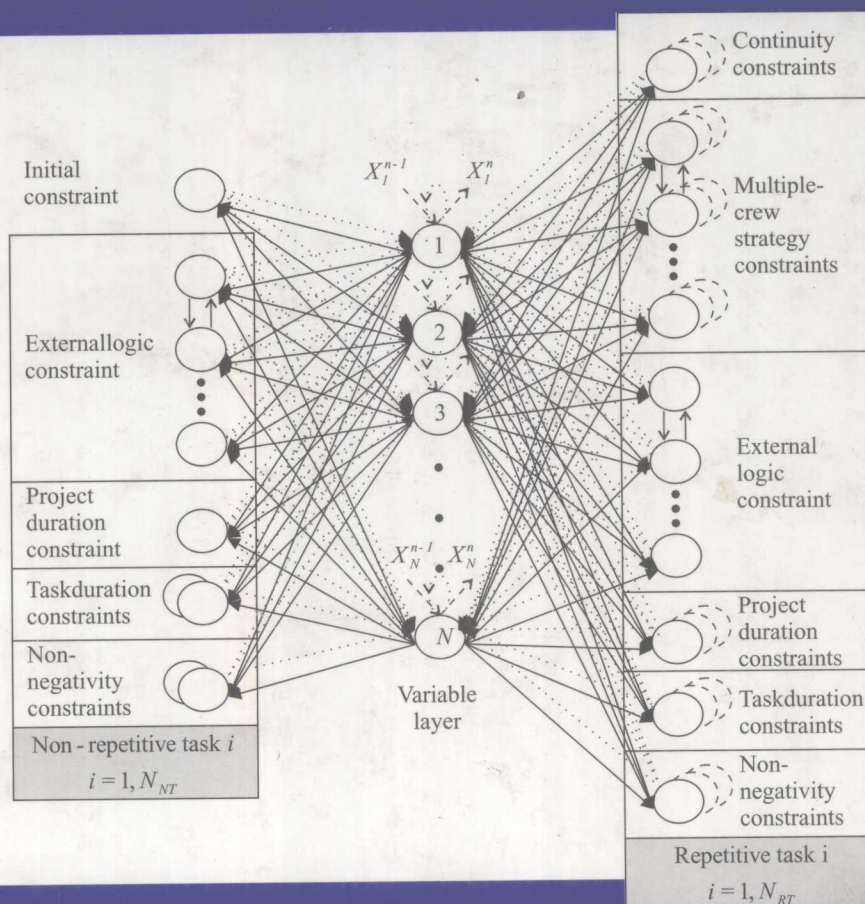


Construction Scheduling, Cost Optimization, and Management

A new model based on neurocomputing and object technologies



Hojjat Adeli and Asim Karim

**CONSTRUCTION SCHEDULING, ⁷⁴¹⁷²
COST OPTIMIZATION, AND MANAGEMENT**

*A New Model Based on Neurocomputing
and Object Technologies*

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The Ohio State University



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PREFACE

The primary purpose of this book is to present an entirely new approach to management and scheduling of construction projects overcoming the limitations of existing methods. We start from ground zero with a most general mathematical formulation for scheduling and management of construction projects with the goal of minimizing the direct construction cost. The construction direct cost optimization problem is then solved by the robust neural dynamics model of Adeli and Park. An object-oriented information model is presented based on the new construction scheduling model, laying the foundation for a new generation of flexible, powerful, maintainable, and reusable software system for the construction scheduling problem.

In order to demonstrate the practicality of the new computational and information models for management and scheduling of actual construction projects, they have been implemented in a new generation software system, called CONSCOM (for CONstruction Scheduling, Cost Optimization, and Change Order Management).

Some of the unique features of CONSCOM non-existent in CPM-based models are described through examples. It must be pointed out that CONSCOM is not just a software system but represents a new technology for management and scheduling of construction projects based on advanced computational, neurocomputing, and object technologies.

The current prevailing design and construction practice is to complete the design before the construction is started. In other words, design and construction are treated as two independent and separate activities. Integration of design and construction through the emerging field of *concurrent* or *collaborative engineering* provides a number of advantages, and an opportunity to advance the two fields of construction engineering and structural engineering significantly. CONSCOM with its change order management capability is particularly suitable for use in a concurrent engineering environment. Successful application of concurrent engineering in the construction industry should be based on effective integration of the construction management and scheduling with the design process. The other essential prerequisite for such an integration is a tool to automate the complex process of engineering design. A chapter in the book is devoted to this subject. Finally, for the sake of completeness, fundamentals of project planning, scheduling, and management, and the ubiquitous industry standard Critical Path Method (CPM) are also presented in the book.

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Transportation, Ohio Department of Development, and the State of Ohio Research Challenge Program, professional societies such as the American Iron and Steel Institute and the American Institute of Steel Construction, and corporations such as Cray Research Inc., U.S. Steel, and Bethlehem Steel Corporation.

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