

## ARVIND KUMAR, Assistant Vice President - Research & Development

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Arvind Kumar is Assistant Vice President of Research & Development at Innovative Scheduling. He holds a B.S. in Chemical Engineering from the Indian Institute of Technology, Madras, and a Ph.D. in Industrial and Systems Engineering from the University of Florida, Gainesville. His award-winning Ph.D. research pioneered algorithms to improve the planning of radiation-therapy treatment for cancer patients.

Arvind specializes in mathematical modeling of complex, real-life decision problems using state-of-the-art operations research techniques. He strives to provide simple, elegant solutions to complex problems. His principal emphasis is on developing robust, flexible solution techniques that can easily adapt to ever-changing business requirements. He is an expert in both optimization and simulation techniques.

Arvind is the lead development manager for the railroad blocking optimizer and the locomotive planning optimizer. He is also a key member of the team developing the truckline network planning system. In addition to working on these core products, Arvind is also an accomplished consultant and actively supports projects in strategy, planning, and analysis.



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### PROFESSIONAL EXPERTISE

- Over eight year of experience in developing and managing optimization-based products and consulting activities.
- Deep understanding of the operations of the transportation industry. Worked closely on multiple studies with executives and planners at class I railroads and LTL carriers.
- Thorough understanding of network optimization, discrete optimization, column generation, and meta-heuristics.
- Advanced design and programming skills in Excel, C#, C++, VBA for Excel, VBA for Access, and Concert Technology.
- Proficient in HTML, VB .NET, ASP .NET, and SQL Server.

### AWARDS AND PATENTS

- 2003 Pierskalla Award given by INFORMS to the best paper of Operations Research in Health Applications for the paper, *A Column Generation Approach to Radiation Therapy Treatment Planning using Aperture Modulation*.
- 2005 Provisional Patent for Radiation Therapy System using Interior-Point Methods and Convex Models for Intensity Modulated Fluence Map Optimization. U.S. Provisional Patent Application No. 60/537,779.
- 2007 *Koopman Prize* given to the best contribution to Military Operations Research for the paper, *Exact and Heuristic Algorithms for the Weapon-Target Assignment Problem*

### SELECTED PROJECTS

- Consulting studies at various LTL companies to evaluate current business, and design the roadmap for the next generation IT systems.
- Algorithms for truckline linehaul optimization.
- Consulting study for CSX to optimize the blocking plan.
- Implementing blocking algorithm at BNSF Railway.
- Locomotive planning studies for CSX Transportation.
- Developing train scheduling models for the National Science Foundation project.
- Distribution planning for Toyota Motors.