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# Summary of I-Lin Wang's Research Works

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# Outline

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- Biography
- Journal Publications
- Publication & Awards Summary
- Projects
- Research Interests

# Biography

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- Undergraduate (87~91) : Aerospace engineering, NCKU
  - Orbital mechanics
- Master (94~96) : Operations Research Center, MIT
  - Premultiplier network simplex algorithm under Prof. Orlin
- Researcher (96~97) : Network system lab, Fujitsu, JP
  - Optical network wavelength routing & assignment algorithm
- Ph.D. (98~03) : ISyE, GA Tech
  - Shortest paths and multicommodity flows under Prof. Johnson
- Assistant professor (03~07) : IIM, NCKU
- Associate professor (07~) : IIM, NCKU

# Publications

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## □ Journal papers (by 2010.01.19)

- Wang, I.-L., E.L. Johnson, J.S. Sokol, 2005, A multiple pairs shortest path algorithm, *Transportation Science*, 39(4), pp. 465-476. (SCI/SSCI)
- Sheu, R.L., M.J. Ting, I.-L. Wang, 2006, Maximum flow problem in the distribution network, *Journal of Industrial and Management Optimization*, 2(3), pp. 237-254. (SCI)
- Wang, I.-L., W.-C. Yang, 2007, Fast Heuristics for Designing Integrated E-Waste Reverse Logistics Networks, *IEEE Transactions on Electronics Packaging Manufacturing*, 30(2), pp. 147-154. (SCI)
- Wang, I.-L., 2008, Distributing Small Packages in Metropolitan Area by Motorcycle Courier Services, *International Journal of Integrated Supply Management*, 4(1), pp. 88-101.
- Wang, I.-L., 2008, On solving shortest paths with a least-squares primal-dual algorithm, *Asia-Pacific Journal of Operational Research*, 25(2), pp. 135-150. (SCI)
- Wang, I.-L., Y.-H. Yang, 2009, On Solving the Uncapacitated Minimum Cost Flow Problems in a Distribution Network, *International Journal of Reliability and Quality Performance*, 1(1), pp. 53-63.
- Wang, I.-L., S.-J. Lin, 2009, A network simplex algorithm for solving the minimum distribution cost problem, *Journal of Industrial and Management Optimization*, 5(4), pp. 929-950. (SCI)

# Publications & Awards Summary

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## □ Summary of publications (by 2010.01.19)

- Int. Journal: 7 (SCI/SSCI: 5; non-SCI: 2)
- Int. Conference (outside TW): 8
- Int. Conference (inside TW): 8
- Dom. Conference: 13

## □ Awards Received (by 2010.01.19)

- Master Thesis / Best Paper Awards (served as thesis advisor / co-author)
  - 10 awards (4 first place; 1 second place; 1 fourth place; 4 best papers)
    - By ORSTW: 5 ; CIIE: 3; DHL: 1; Automation: 1
- Undergraduate Projects Awards (served as thesis advisor / coauthor)
  - 2 awards (1 first place; 1 second place)
- Best Poster Award
  - 1 award (by NSC IEM Program)

# Projects (1/2)

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## □ NSC Projects

- Multiple Pairs Shortest Paths Algorithms  
NTD 362,800 NSC 92-2213-E-006-094
- New column generation and partitioning methods for multicommodity network flow problems  
NTD 509,900 NSC 93-2213-E-006-096
- New nonnegative least squares primal-dual methods for network optimization problems  
NTD 150,000 NCKU 950104
- On solving the minimum distribution cost flow and maximum distribution flow problems  
NTD 651,000 NSC 95-2221-E-006-268
- Design of a Trip Planning Decision Support System for Public Transportation in a Metropolitan Area  
NTD 47,000 NSC 96-2815-C-006-065-H
- Haplotyping population by optimization theorems and algorithms (I)  
NTD 590,000 NSC 96-2221-E-006-015

# Projects (2/2)

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## □ NSC Projects

- Computational Experiments by a Dual-Primal Non-negative Least Squares Method for Maximum Flow Problems  
NTD 47,000 NSC 97-2815-C-006-031-E
- Haplotyping population by optimization theorems and algorithms (II)  
NTD 585,000 NSC 97-2221-E-006-173
- Planning Optimal Bike Routes based on Target Calories Burned  
NTD 47,000 NSC 98-2815-C-006-107-H
- Solving the tagSNP Selection Problem by Bi-objective Programming  
NTD 47,000 NSC 98-2815-C-006-048-E
- A Study on Reliability for Distribution Networks with Multi-state Capacitated Arcs  
NTD 1,279,000 NSC 98-2410-H-006-115-MY2

## □ Industry Project

- 300mm 晶圓廠即時性生產排程系統導入計畫 (TSMC)  
NTD 500,000

# Research Interests (1/3)

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## □ Network Optimization

- Shortest Path
- Maximum Flows
- Min-cost Flows
- Multicommodity Network Flows
- Distribution Networks (D-node)

## □ Logistics, Supply Chain Management

- Reverse Logistics Network Design
- Metropolitan Motorcycle Courier Systems
- Public Bicycle Sharing Systems

## □ Bioinformatics

- Haplotype Inference
- TagSNP Selection



# Research Interests (2/3)

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## □ Personal Navigation

- Quickest Itinerary Planning with/without Timetable
- Minimum Fare Itinerary Planning without Timetable
- Optimal Biking Routes with a Target Range of Calorie Consumption
- Optimal Euler Subgraphs of bounded lengths

## □ Network Reliability

- Reliability for Multi-state Capacitated Manufacturing Networks with Distillation Process

## □ Semiconductor Manufacturing

- 1-stage Complex Job-Shop Scheduling with recipe, release time, due date, and setup time consideration
- 2-stage Complex Job-Shop Scheduling with recipe, release time, due date, and batch process (2 jobs of the same recipe) consideration

## □ Data Mining

- Change Mining

# Research Interests (3/3)

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## □ Project Management

- Stable project baseline schedules with time constraints

## □ Staff Rostering

- Designing a Nurse Rostering Information System for Site Management Organizations
- Railway Staff Rostering and Re-rostering Problem

## □ Pavement Optimization

- Project level
- Network level

## □ Telecommunication

- Optimal wavelength assignment & routing algorithm
- Sensor Network



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# Thank you !

## Q & A

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