

Professor YING-EN (ETHAN) GE

BSc, MSc, PhD

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RESEARCH AND TEACHING INTERESTS

- **Research:** applying theory and methodology of operations research, statistics, probability and time series analysis to
 - Vehicular traffic flow on single roads and on road networks,
 - Transportation economics, and
 - Transportation and the environment, including modeling, algorithms and implementation
- **Teaching:** Modules in the areas of
 - Transportation Planning and Management
 - Operations Research/Management Science (OR/MS)

EDUCATION

PhD Transportation planning and management, Tongji University, Mar. 1996 – Nov. 1999
Thesis: *The Combined Traffic Assignment and Signal Control Problem: A Game-Theoretical Approach*

MSc Probability theory & mathematical statistics, Southeast University, Aug. 1993 – Mar. 1996

BSc Applied mathematics, Dalian University of Technology, Sep. 1989 – July 1993
(majored in applied mathematics and minored in software engineering)

Scholastic honors

- Sino-British Fellowship Trust Visitorship 2012 (The Visitorship was established in 1947 and supports 3 - 4 visitorships each year from academic and similar institutions in the mainland of China to visit the University of Hong Kong. Please see http://www.als.hku.hk/hkucao/sbftv_e.php for further information on the Visitorship)
- University of Ulster Research Fellowship 2002
- Jingchuan Distinguished Research Fellowship, 1998
- Guanghua Distinguished Research Fellowship, 1998
- First-level award in the middle-term evaluation of PhD students in May 1998
- Ni-Li Distinguished Research Fellowship, 1996-1997
- Distinguished student awards, every year of my BSc programme

PRESENT POST

- **Professor**, Mar 2010 – present
School of Transportation & Logistics, Dalian University of Technology

PREVIOUS WORKING EXPERIENCE

- **Director**, Sep 2009 – Mar 2010
Traffic Flow Soft Ltd, Cambridge, England
- **Senior Analyst**, July 2008 – Nov 2009
Urban, Regional and Transport Planning
David Simmonds Consultancy Limited Cambridge, England
- **Research Fellow**, Aug. 2007 – June 2008
Transport Research Institute (TRi) Napier University, Edinburgh
- **Research Fellow**, Dec. 2003 – Sep. 2006
School of Management & Economics Queen's University Belfast
- **Volunteer** – a leader of a youth group, Sep. 2004 – July 2005
Chinese Welfare Association, Belfast
- **Research Fellow**, Dec. 2002 – Nov. 2003
Research Associate/Officer, Jan. 2001 – Nov. 2002
School of Business Organisation & Management University of Ulster
- **Post-doctorate Fellow**, Apr. 2000 – Jan. 2001
Institute of Transportation Studies University of California at Davis
- Nov. 1999 – Apr. 2000
Department of Road and Traffic Engineering Tongji University
During this period when I was waiting for my US visa to the University of California at Davis for post-doctorate research, I assisted in carrying out research on a project funded by the National Natural Science Foundation of China and organising an international symposium on urban transportation.
- **Research Assistant**, Jan. 1999 – June 1999
Department of Civil and Structural Engineering Hong Kong Polytechnic University

TEACHING AND TRAINING EXPERIENCE

- **Modules taught or co-taught**
 - *Transportation Economics* (2010 – present, each Autumn, for 3rd-year undergraduates at the Dalian University of Technology)
 - *Transportation Network Analysis* (2010 – present, each Spring, for masters students at the Dalian University of Technology)
 - *Technical English for Postgraduates in Traffic and Transportation Engineering* (Spring 2010 for masters students at the Dalian University of Technology.)
 - *Econometric Modeling in Traffic and Transportation Engineering* (Autumn 2010 for masters students at the Dalian University of Technology.)
 - *Interpreting, Presenting and Using Data* (2003-2005, for 2nd-year undergraduates, with Prof M. Carey at the University of Ulster and then in the Queen's University of Belfast)
 - *Stochastic Processes* (1997, for postgraduates at Tongji University)
 - *Econometrics* (1993, for postgraduates, with Prof D. Zhu at Southeast University)
- **Teaching assistant**
 - *Management Science in Operations*
 - *Management Problem Solving*
 - *Advanced Calculus*

} (all for undergraduates)
- **Assisted in training undergraduates for the Mathematical Contest in Modeling (MCM)**

- **Training delivered**
 - *VBA for MS Excel 2007* (to colleagues at DSC in Oct 2008)
 - *Using Names in MS Excel* (to colleagues at DSC in Oct 2008)

STUDENT SUPERVISION

- 2010 – present
 - Supervise research students
 - Masters students
 - Graduated: Mr Baoyu Hu, July 2012
 - Current: Lanlan Guo (2010), Chunyan Tang (2011), Chongfeng Xue (2011), Yuandong Liu (2012)
 - PhD students:
 - Current: Bingzheng Liu (2012)
- 2011 – present
 - Supervise final-year undergraduates' final projects
- 2007 – 2008
 - Supervised a PhD student working on the modelling of mixed traffic flow

PROJECTS

Under Investigation

- *Investigating and overcoming boundary issues arising from congestion charging* (Grant no.: 71171026), Principal Investigator (PI), National Natural Science Foundation of China, 2011.01-2013.12
- *Modeling traffic flows at junctions for the Dynamic Traffic Assignment Problem* (Grant no.: 20110041120009), Principal Investigator (PI), Department of Education of China, 2012.1 – 2014.12
- *Investigating uncertainties in advanced traveler information services and their impacts* (Grant no.: 40271045), Key Participant, National Natural Science Foundation of China, 2011.01-2013.12

Completed

- funded by research councils
 - *Investigating conflicts and complementation in multi-source traffic data*, Principal Investigator (PI), Start-up Grant, Dalian University of Technology, 2010.3 – 2011.12
 - *User reaction and efficient DIFFERENTIATION of charges and tolls*, Participant, The European Communities 6th Framework Programme, completed in 2008.
 - *Impacts of Traffic Heterogeneity on Roadside Air Pollution Concentration in Edinburgh*, Co-PI, Transport Research Institute, Napier University, completed in 2008.
 - *Modelling Road Tolling in Dynamic Traffic Assignment (DTA): Preliminary Scoping*, Co-PI, Transport Research Institute, Napier University, completed in 2008.
 - *Modelling congested traffic on road networks: overcoming substantial limitations*, Key Participant, The Engineering and Physical Sciences Research Council (EPSRC), UK, completed in 2008.
 - *Predicting and Planning Time-Varying Traffic on Road Networks Using Dynamic Assignment Modelling*, Key Participant, Higher Education Authority (HEA), Ireland, completed in 2006.
 - *Capturing Time-Varying Link Flows and Their Properties in Road Traffic Network Modelling*, Key Participant, The Engineering and Physical Sciences Research Council (EPSRC), UK, completed in 2005.

- *A More Flexible Framework for Modelling Time-Varying Traffic on Road Networks*, Key Participant, EPSRC, UK, completed in 2001.
 - *Dynamic Driver Information Systems for the Expressway Network in Hong Kong*, Participant, Research Grants Council of Hong Kong, China, completed.
 - *Control and Guidance Systems of Urban Traffic Flows*, Participant, National Natural Science Foundation, China, completed.
- funded by government agencies
- *Development and Evaluation of Adaptive Ramp Metering*, Key Participant, California PATH Program, USA, completed, 2000.
 - *Urban Road Network Planning of Guigang County*, Key Participant, Guangxi Zhuang Autonomous Region, China, completed, 1997-1998.
 - *Land-Use and Transport Integrated Modelling* for those projects at David Simmonds Consultancy, Key Participant, 2008-2009.

SELECTED PROFESSIONAL ACTIVITIES

- Associate Editor of *Transportmetrica Part B: Transport Dynamics*
- Paper reviewing
 - *Transportation Science, Transportation Research, Transportmetrica, Networks and Spatial Economics* and Transportation Research Board's *Annual Meetings*
- Proposal reviewing
 - Natural Science Foundation of China
- Conference activities
 - Chair of Invited Session on Traffic Congestion Pricing at INFORMS International Beijing 2012
 - Chair of the "Transportation Network Analysis" session at the 2nd Transportation Research Forum (Shanghai), 23 October, 2011
 - Permanent member of the International Organizing Committee of the series of International Symposia on Travel Demand Management
- Membership of professional organizations or societies
 - Senior membership of the Highway Society of China
 - Member of the Institute of Operations Research and Management Sciences (INFORMS)

PUBLICATIONS (most recent first)

Journal papers

Accepted

1. Carey, M. and Ge, Y. E. "Comparison of methods for path inflow reassignment for dynamic user equilibrium," *Networks and Spatial Economics*, published online on 12 April 2011, DOI 10.1007/s11067-011-9159-6.

Published

2. Ge, Y. E. and Zhou, X. "An alternative definition of dynamic user optimum on signalised road networks," *Journal of Advanced Transportation*, 46(3): 236 – 253, 2012. DOI: 10.1002/atr.207.

3. Ge, Y.E., Wu, N. and Sun B. "A car-following model coupling GM model with Pipes model." *Advanced Materials Research*, Vols. 243-249, 4392-4401, 2011.
4. Carey, M. and Ge, Y. E. "Retaining desirable properties in discretising a whole-link travel-time model," *Transportation Research Part B* 41, 540–553, 2007.
5. Lin, J. and Ge, Y. E. "Impacts of traffic heterogeneity on roadside air pollution concentration," *Transportation Research Part D* 11, 166–170, 2006.
6. Carey, M. and Ge, Y. E. "Alternative conditions for a well-behaved travel-time model," *Transportation Science* 39, 417–428, 2005.
7. Carey, M. and Ge, Y. E. "Convergence of a discretised travel-time model," *Transportation Science* 39, 25–38, 2005.
8. Zhang, H. M. and Ge, Y. E. "Modeling variable demand equilibrium under second-best road pricing," *Transportation Research Part B* 38, 733–749, 2004.
9. Carey, M. and Ge, Y. E. "Efficient discretisation for link travel time models," *Networks and Spatial Economics* 4, 269–290, 2004.
10. Carey, M. and Ge, Y. E. "Comparing whole-link travel-time models," *Transportation Research Part B* 37, 905–926, 2003.
11. Ge, Y. E., Zhang, H. M. and Lam, W. H. K. "Network reserve capacity under influence of traveler information," *ASCE Journal of Transportation Engineering* 129, 262–270, 2003.
12. Carey, M., Ge, Y. E. and McCartney, M. "A whole-link travel-time model with desirable properties," *Transportation Science* 37, 83–96, 2003.
13. Lü, J., Ge, Y. E. and Yang, P.-K. "A study of drivers' behavior under the influence of guidance/information," *Journal of Highway and Transportation Research & Development* 16, 68–72, 1999.
14. Ge, Y. E. and Yang, P.-K. "Route choice model under the influence of guidance information," *Journal of Tongji University* 26, 659–663, 1998.
15. Ge, Y. E. and Yang, P.-K. "Genetic algorithms for solving transportation network equilibrium problems with capacity constraints," *Journal of Highway and Transportation Research & Development* 15, 17–20, 1998.
16. Ge, Y. E. and Yang, P.-K. "A review of the combined route choice-intersection control problem," *Journal of Highway and Transportation Research & Development* 15, 33–37, 1998.
17. Yuan, W., Ge, Y. E. and Liu, A. "A neural network model for capturing dynamic characteristics of traffic at road intersections," *Information and Control* 27, 464–468, 1998.
18. Ge, Y. E. and Yang, P.-K. "A review of applications of mathematical models in travel demand forecasting," *Journal of Traffic Engineering* (issue 3), 3–9, 1997.
19. Ge, Y. E., Lü, J. and Fang, D. "Theory, methodology and data: three essential factors of a good traffic model," *Journal of Traffic Engineering* (issue 2), 3–9, 1997.
20. Zhu, D. and Ge, Y. E. "Note on the final product rate," *Systems Engineering* 15, 12–15, 1997.

Book Chapters

21. Ge, Y. E. and Stewart, K. "Investigating boundary issues arising from congestion charging in a bottleneck scenario," Chapter 16 of *New Developments in Transport Planning: Advances in Dynamic Traffic Assignment*, C. Tampère, F. Viti and L. H. Immers (eds), 303-326, Publisher: Edward Elgar, 2010.

Conference papers

Accepted or presented

22. Ge, Y. E. “Boundary effects of the London Congestion Charging Scheme,” INFORMS International Beijing 2012, 24-27 June 2012, National Convention Center, Beijing, China.
23. Ge, Y. E., Stewart, K., Sun, B. and Ban, X.G. “Investigating undesired spatial and temporal boundary effects of congestion charging,” accepted for presentation at the *Fourth International Symposium on Dynamic Traffic Assignment*, 4-6 June 2012 on Martha’s Vineyard, Massachusetts, U.S.A.
24. Ge, Y.E., Sun, B. R., Zhang, H. M. and Szeto, W. Y. “A comparison of dynamic user optimal states with zero, fixed and variable tolerances,” accepted for presentation at the *4th International Symposium on Dynamic Traffic Assignment (DTA2012)*, 4-6 June 2012, Boston, USA.
25. Ge, Y.E. and Sun, B. “A car-following model with consistent separation distance,” presented at the *16th Hong Kong Society of Transportation Studies Conference*, 17-20 December, 2011.
26. Ge, Y. E. “A Stochastic Choice Model Capturing Decision-Making Behaviour on Road Transport Networks under Traveller Information Provision,” presented at the *2nd International Choice Modelling Conference*, 4 – 6 July 2011, Oulton Hall, Leeds, England, U.K.
27. Ge, Y. E. and Stewart, K. “Investigating boundary issues arising from congestion charging,” presented at the *Fifth Travel Demand Management Symposium* and revising for publication, 26-28 October 2010, Aberdeen, Scotland, U.K.
28. Stewart, K. and Ge, Y. E. “Optimising network flows by low-revenue tolling under the principles of dynamic user equilibrium,” *41st Annual UTSG (Universities’ Transport Study Group) Conference*, 5 - 7 January 2009, UCL Centre for Transport Studies, London; a revised version presented at the *5th IMA Conference on Mathematics in Transport*, 12-14 April 2010, UCL Centre for Transport Studies, London and to be published in a book titled *Mathematics in Transport*.

Published

29. Stewart, K. and Ge, Y. E. “Optimising time-varying network flows by low-revenue tolling with fixed and bell-shaped toll profiles,” *Proceedings of the 16th International Conference of Hong Kong Society for Transportation Studies* (ISBN: 978-988-98847-9-6), 17-20 December 2011, Hong Kong, pp. 393-400.
30. Ge, Y. E. and Carey, M. “Travel time computation of link and path flows and first-in-first-out,” in *Proceedings of the 4th International Conference on Traffic and Transportation Studies*, B. Mao, Z. Tian and Q. Sun (eds), 326–335, Beijing: Science Press, 2004.
31. Carey, M. and Ge, Y.E. “Link flow and travel-time models used in dynamic traffic assignment,” *36th Annual Conference of UTSG*, University of Newcastle upon Tyne, 5-7 January, 2004.
32. Ge, Y. E., Carey, M. and Yang, P.-K. “Stochastic choice behaviour on road traffic networks under traveller information provision,” *Workshop on Behavioural Responses to ITS* (included in the Workshop Proceedings in CD format), University of Eindhoven, April 2003.
33. Ge, Y. E. and Carey, M. “Link outflow rate computing under continuous dynamic loads,” in *Proceedings of the 3rd International Conference on Traffic and Transportation Studies*, K.C.P. Wang, G. Xiao, L. Nie and H. Yang (eds), 770–777, ASCE, 2002.
34. Ge, Y. E. and Yang, P.-K. “A differential Nash model for multiple equilibrium behaviors on congested networks under guidance/information,” in *Proceedings of the 1999 Shanghai International Symposium on Urban Transportation*, Shanghai Institute of Traffic Engineers (ed), 425–431, Shanghai: Tongji University Press, 1999.

35. Lam, W. H. K., Lo, H. P. and Ge, Y. E. "Link travel time estimation using loop detector data," in *Proceedings of the International Conference of Civil and Environmental Engineering*, Volume 4, Y. Tanaboriboon, Y. Herabat, T. Nakatsuji and K. Takahashi (eds), v1–v10, 1999.
36. Ge, Y. E. and Yang, P.-K. "Solving asymmetric network equilibrium problems with genetic algorithms," in *Proceedings of the 1st International Conference on Traffic and Transportation Studies*, Z. Yang, P. C. Wang and B. Mao (eds), 256-265, ASCE, 1998.
37. Ge, Y. E. and Fang, H. "Neural networks for user-optimal traffic assignment problems," in *Proceedings of the 2nd Symposium of Chinese Young Scholars on Operations Research and Management Science*, 273–279, Beijing: Yuhang Press, 1997.

CONFERENCE AND WORKSHOP PRESENTATIONS (most recent first)

- *A Comparison of DUO with Zero, Fixed and Variable Tolerances*, Second Transportation Research Forum – Shanghai, 23 October 2011.
- *On two stable states of time-varying traffic flow on signalized road networks*, presented at 3rd International Symposium on Dynamic Traffic Assignment, 29-31 July, Takayama, Japan.
- *A review of dynamic traffic assignment*, Dalian University of Technology Seminar on Transportation (DUT - SemiTrans), 23 July 2010.
- *On two stable states of time-varying traffic flow on signalized road networks* (keynote speech), presented at 1st Transportation Forum and 6th China-Japan Joint Transportation Forum, 11-12 June, Shanghai, China.
- *A preliminary numerical comparison of three heuristic methods for path reassignment for dynamic user equilibrium* (with M. Carey). Transport Workshop on Dynamic Traffic Assignment (DTA), Queen's University Belfast, Sept 2004.

INVITED TALKS (most recent first)

- [1] *A comparison of dynamic user optimum states with zero, fixed and variable tolerances*, University College London, U.K., 20 June 2012.
- [2] *Boundary effects of the London Congestion Charging Scheme*, Purdue University, U.S.A., 15 June 2012.
- [3] *A comparison of dynamic user optimum states with zero, fixed and variable tolerances*, University of Illinois at Chicago, U.S.A., 13 June 2012.
- [4] *Boundary effects of the London Congestion Charging Scheme*, Rensselaer Polytechnic Institute, New York, U.S.A., 7 June 2012.
- [5] *Modeling of dynamic traffic on variable transportation networks*, University of Science and Technology of China, Hefei, 14 December 2010.
- [6] *Some remarks on dynamic traffic assignment modeling*, College of Transportation Engineering, Tongji University, 13 September 2010.
- [7] *Usage of Dynamic traffic assignment models*, School of Management, Shanghai Maritime University, 21 March 2010.
- [8] *Investigating boundary issues arising from congestion charging in a bottleneck scenario* (with Kathryn Stewart). Seminar at Transport Research Institute (TRi), Napier University, 7th Mar 2008.
- [9] *Dynamic link travel time modelling*. Jilin University, College of Transportation, August 2004.

- [10] *Perceived travel time models and route choice decision-making rules*. Tsinghua University, Institute of Transport Research, January 2004.
- [11] *Challenges on presumptions of (static) traffic assignment*. Tongji University, Department of Road and Traffic Engineering, December 2003.
- [12] *Perceived travel time models, considering information quality and individual interpretation abilities*. Southeast University, College of Transportation, December 2003.
- [13] *Traveller information provision, road traffic congestion pricing and dynamic traffic assignment*. Tongji University, Department of Road and Traffic Engineering, June 2002.
- [14] *Equilibrium traffic assignment under road pricing and multiple information sources*, Research Group's Internal Seminar (once a week for 3 weeks), Department of Civil & Environmental Engineering, University of California at Davis, December 2000.

WORKING PAPERS

- *Equilibrium traffic assignment under road pricing and multiple information sources* (with H. M. Zhang).
- *A wages-based employment model* (with D. S. Simmonds and A. W. Dilleen)
- *An optimal control model for pricing of congestion-prone systems*
- *Alternative formulations of the asymmetric stochastic traffic assignment problem*.
- *A class of perceived travel time models taking into account both information quality and individual interpretation abilities*.
- *A special property of a whole-link travel-time model used in dynamic traffic assignment*.