2014. Oct.02 Yasuo Asakura

61066
Transportation Network Analysis (交通ネットワーク分析)
2nd Semester（October）, （Even Years）（2－0－0）
Prof. Yasuo ASAKURA
Mathematical formulation and solution algorithms for User Equilibrium models in transportation networks are described based on the nonlinear optimization framework. A variety of UE models are introduced including deterministic UE model with fixed OD demand and stochastic UE model with variable OD demand. Possible applications of those models to transportation planning are also discussed.

1.	Roles of transportation network analysis
2.	Nonlinear optimization theory
3.	Solution algorithms
4.	User Equilibrium model with fixed OD demand
5.	User Equilibrium model with variable OD demand
6.	Stochastic User Equilibrium
7.	Application of UE models

Textbooks
1. 土木学会編(1998)　交通ネットワークの均衡分析-最新の理論と解法-，丸善.
2. 土木学会編(2003)　道路交通需要予測の理論と適用，丸善.
3. Sheffi, Y. (1985) Urban Transportation Networks: Equilibrium Analysis with Mathematical Programming Methods, Prentice Hall.

4. Ben-Akiva, M. & Lerman, S (1985) Discrete Choice Analysis, MIT Press.
5. Daganzo, C. (1997) Fundamentals of Transportation and Traffic Operations, Pergamon.
6. Bovy, P.H.L & E. Stern (1990) Route Choice: Wayfinding in Transport Networks
7. Patriksson, M. (1994) The Traffic Assignment Problem: Models and Methods, VSP BV.
8. Bell, M.G.H & Y.Iida (1997) Transportation Network Analysis, Wiley.
9. Hall, R.W. (2003) Handbook of Transportation Science 2nd Edition, Kluwer.

http://web.mit.edu/sheffi/www/

Dr. Yossi Sheffi is a professor at the Massachusetts Institute of Technology, where he serves as Director of the MIT Center for Transportation and Logistics (CTL). He is an expert in systems optimization, risk analysis, and supply chain management, which are the subjects he teaches and researches at MIT.
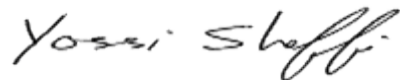
Text

http://web.mit.edu/sheffi/www/urbanTransportation.html

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2014 Autumn Lecture Schedule

SEQ	Date	Topic	Chapter in Sheffi's Text
1	Oct. 02	Concept of Equilibrium	1.1
2	Oct. 09	Network Representation	1.2
3	Oct. 16	Network Equilibrium	1.3
4	Oct. 23	Nonlinear Programming (NLP)	2.1 & 2.2
5	Oct. 30	Exercise	
	Nov. 06	Lecture for Monday	
6	Nov. 13	Nonlinear Programming (NLP)	2.3
6'	Nov. 13 afternoon	Lecture for Network Reliability	
7	Nov .20	User Equilibrium Formulation	3
8	Nov. 27	NLP Algorithms w/o constraints	4.1 & 4.2
9	Dec. 04	NLP Algorithms with constraints	4.3
10	Dec. 11	Solving UE	5
11	Dec. 18	UE with Variable Demand	6
12	Jan. 08	Discrete Choice	10.1
	Jan. 15	Lecture for Monday	
13	Jan. 22	Stochastic UE	12
14	Jan. 29	Stochastic UE	12
15	Feb. 05	Supplement day	

PDF files of lecture note can be downloaded from Open Course Ware (OCW) or OCW-i in Titech.