G220: Some readings on decision models

A Individual decision

Ben-Akiva, Moshe, and Steven R. Lerman. 1985. *Discrete choice analysis: theory and application to travel demand*. Cambridge, MA: The MIT Press.

The classic reference, from an econometrics perspective. Along the lines of Nobel-prize winner McFadden' work.

Fischer, Manfred M., and Peter Nijkamp. 1985. Developments in explanatory discrete spatial data and choice analysis. *Progress in Human Geography* 9:4: 515-51.

Similar approach to the above, from a more explicitly spatial perspective. Strong overview paper by two top academics.

Smith, Terence R., W. A. V. Clark, and John W. Cotton. 1984. Deriving and Testing Production System Models of Sequential Decision-Making Behavior. *Geographical Analysis* 16:3: 191-222.

A computational model of individual decision-making based on heuristics rather than utility maximizing – by our very own Terry Smith!

Tversky, Amos, and Daniel Kahneman. 1982. Judgement under uncertainty: Heuristics and biases. In *Judgement Under Uncertainty: Heuristics and Biases.* eds. D. Kahneman, P. Slovic, and A. Tversky, 3-20. Cambridge: Cambridge University Press.

A classic paper from cognitive psychology. How *real* people make decisions- and how they mess things up.

B Collective decision and agent-based models

Axelrod, Robert. 1997. *The complexity of cooperation: agent-based models of competition and collaboration*. Princeton Studies in Complexity. Princeton, NJ: Princeton University Press.

A useful, not very technical book on agent models. Axelrod is the famous 'inventor' of the TIT-FOR-TAT rule (ask for more details…)

Batty, Michael, and Bin Jiang. 1999. Multi-agent simulation: new approaches to exploring space-time dynamics within GIS. www.casa.ucl.ac.uk/multi_agent.pdf.

Mike Batty's work is always original and interesting. He's done quite a few fun things with agents lately.

Couclelis, Helen. 1986. A theoretical framework for alternative models of spatial decision and behavior. *Annals of the AAG*, 76(11), 95-113.

They didn't yet call them 'agents' back then but that's what this is about. A computational model of a way-finding agent is described as a member of a hierarchy of decision models.

Gimblett, H. Randy, Merton T. Richards, and Robert M. Itami. 1999. A complex systems approach to simulating human behaviour using synthetic landscapes. *Complexity International* 6, no. January.

A nice applied piece of work looking at the recreational behavior of hikers, boaters, etc. in a natural area.

Sanders, L., D. Pumain, H. Mathian, F. Guerin-Pace, and S. Bura. 1997. SIMPOP: a multiagent system for the study of urbanism. *Environment and Planning B: Planning and Design* 24, no. 2: 287-305.

Very interesting take on agents – here the agents are towns growing in a region.

Schelling, Thomas. 1978. *Micromotives and macrobehavior*. New York: Norton.

How lots of little individual decisions lead to unanticipated large-scale consequences. Beautiful!