CMPT 880: Topics in Computing Science: Modeling of Complex Social Systems

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Lecture room: ASB 10940, The IRMACS Centre, SFU
Time: Fridays 11:30 to 12:30
Course web page: www.sfu.ca/~vdabbagh/CMPT880.htm

DESCRIPTION OF THE COURSE

This is a seminar course that reviews theory and research in complex social systems. In particular we will focus on the impact of social interactions on the dynamic of urban transformations such as crime and infectious diseases in municipal environments. The seminars incorporate mathematical modelling and computer simulations.

TOPICS:

Exact modeling techniques covered will vary with class size and interest, but in general the following topics will be covered.

1. Good Modelling Practices*: Simplicity, Adaptability, Reproducibility, Validation.*
2. Complex Social Networks: *What are they, why model them, examples*.
3. Operational Management Models: *System Dynamics, Scheduling, Queuing Models.*
4. Forecasting Models: *Regression Analysis, Markov Models, Discrete Event Models*.
5. Pattern Reconstruction Simulation Models: *Cellular Automata, Network Models, Agent Based Models*.

GRADING:

Class discussion: 10%
Class Presentations (2): 15% + 25%
Group Project: 30%
Individual research project: 20%

TEXTBOOKS:

There is no specific textbook for the class. The course will draw on material from a wide range of sources and will provide students with book excerpts and journal papers as appropriate to supplement lecture notes.

PREREQUISITES:

No specific courses are required, however students should be in a graduate program. The 4^{th} year students of an honours undergraduate program can register in this course only with a permission from the department.