ISTANBUL COMMERCE UNIVERSITY

Workshop Series
STATE-OF-ART COMPUTATIONAL METHODS IN SOCIAL SCIENCES

Organized by İstanbul Commerce University
Faculty of Business
Spring 2020

Aim and Scope:

The purpose of this workshop series is to create a scientific platform exploring a subset of the state-of-art computational methods in social sciences. The methods in question range from conventional statistical/econometric methods to artificial intelligence. Both singular methods in isolation as well as eclectic combinations of them will be presented by various scholars. Selected introductory, intermediate and advanced topics concerning dynamic and stochastic processes in social sciences will be included in the program. Though each session will constitute a distinct workshop with a particular targeted skill, topics and methods to be covered by the workshop series will be presented in an integrated and interconnected manner.

Some of the workshop presentations to be included in the series are:

1	Introduction to Data Mining	18 April 2020
2	Classification, Clustering and Decision Trees	25 April 2020
3	Introduction to Artificial Intelligence and Deep Learning	02 May 2020
4	Business Intelligence	09 May 2020
5	Simulation Paradigms I: System Dynamics Modeling	16 May 2020
6	Simulation Paradigms II: Agent Based Modeling	30 May 2020
7	Basic Statistical and Econometric Modeling	06 June 2020
8	Social, Economic and Political Applications of econometric modeling	13 June 2020
9	Time Series Analysis	20 June 2020
10	Panel Data Analysis and Applications	27 June 2020

Place and time: The online link for live presentations will be provided by the Dean's office. Hours: 15:00-17:00. There will be **Q & A** sessions following each presentation.

Software: **Python**, **Matlab**, **Eviews**, **SPSS** and various **simulation** and **business intelligence** software (Depending on the evolving needs that might arise during the course of the workshop series, there could be changes in the list of the programs to be used).

REFERENCES

(Works that may be referred to for the purpose of exploring selected details of the topics to be presented)

Books and Articles

1. Aggarwal, C. (2018). *Neural Networks and Deep Learning: A Textbook, Springer*.
2. Aljandali, A. and Tatahi, *M. (2018). Economic and Financial Modeling with EViews,* Springer.
3. Alpaydın, E. (2014). *Introduction to Machine Learning.* The MIT Press.
4. Barlas, Y. 2002. "System Dynamics: Systemic Feedback Modeling for Policy Analysis," in Knowledge for Sustainable Development – An Insight into the Encyclopedia of Life Support Systems, UNESCO-Eolss Publishers, Oxford, UK. pp. 1131-1175.
5. Borshchev, A. (2013). *The Big Book of Simulation Modeling: Multimethod Modeling with AnyLogic 6*, AnyLogic North America.
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7. Chakrabarti, A. S. (2019). *Network Theory and Agent-Based Modeling in Economics and Finance,* Springer.
8. Chollet, F. *(2017). Deep Learning* with *Python,* Manning Publications.
9. Coleman, P.M. *(2013). An Introduction to Partial Differential Equations with MATLAB,* A Chapman&Hall Book.
10. Cross, M. and Greenside H. (2009). *Pattern Formation and Dynamics in Nonequilibrium Systems,* Cambridge University Press.
11. Gintis, H. (2009). *Game Theory Evolving*, Princeton University Press.
12. Gray*, W. (2019). Introduction to Machine Learning with Python.*
13. Gusti Ngurah Agung, *I.* (2014). *Panel Data Analysis using EViews*, Wiley.
14. Güngör, M.S. and Yılmaz V.M. (2019). "Veri Yığınından Bilgiye: Sosyal Bilimciler için Makine Öğrenmesine Giriş. Özcan, Y. and Karakaya, G. (Ed.) in *Bir Değer Aracı Olarak Bilgi: Disiplinler Arası Güncel Yaklaşımlar* (139-152). Nobel Bilimsel Eserler.
15. Kara, A. (2007). "Discrete Stochastic Dynamics of Income Inequality in Education: An Applied Stochastic Model and a Case Study," *Discrete Dynamics in Nature and Society* 2007, 1-15.
16. Kara, A. (2013). "Dynamics of Performance and Technology in Higher Education: An Applied Stochastic Model and a Case Study," *Hacettepe Journal of Mathematics and Statistics* 42(1), 87-99.
17. Lantz, B. *(2019). Machine Learning with R,* Packt Publishing Limited.
18. Lynch, S. (2010). *Dynamical Systems with Applications Using Maple,* Springer.
19. Nusse, H.E. and Yorke, J.A. (1998). *Dynamics: Numerical Explorations,* Springer.
20. Railsback, S.F. and Grimm V. (2012). *Agent-Based and Individual-Based Modeling: A Practical Introduction,* Princeton University Press.
21. Richardson, G.P. (1988). "Chaos in system Dynamics," *System Dynamics Review*, 4, (1-2): 3-13.

22. Sapiri, H. et al. (2017). *Introduction* to *System Dynamics Modeling* and *Vensim Software*, Penerbit Universiti Utara Malaysia.
23. Sharda, R. et al. (2019). *Business Intelligence*: A Managerial Perspective on Analytics, Pearson.
24. Theobald, O. (2017). *Machine Learning for Absolute Beginners: A Plain English Introduction*, Scatterplot Press.
25. Wilmott, P. (2019). *Machine Learning: An Applied Mathematics Introduction*, Panda Ohana Publishing.
26. Wilensky, U. and Rand, W. (2015) *An Introduction to Agent-Based Modeling*, The MIT Press.

Video Lectures

1. **Complexity Academy** (https://www.youtube.com/channel/UCutCcajxhR33k9UR-DdLsAQ/featured) (Systems Innovation)
   1.1. Complexity Economics: (https://www.youtube.com/watch?v=BdnlY5DGcaQ&list=PLsJWgOB5mIMCf7yNnXrHrtaBsa7GXqZAs)
   1.2. Complexity Management: (https://www.youtube.com/watch?v=iX-DzSBwclk&list=PLsJWgOB5mIMC65HNmJmY9IuIWwTRba4Yw)
   1.3. Complex System Design: (https://www.youtube.com/watch?v=iX-DzSBwclk&list=PLsJWgOB5mIMC65HNmJmY9IuIWwTRba4Yw)
   1.4. Systems Theory: (https://www.youtube.com/watch?v=j077RDhMZ7I&list=PLsJWgOB5mIMCo-8LczUK7O7bt7X4Tswtb)
   1.5. Complex Engineered Systems (https://www.youtube.com/watch?v=7wig6-_9Y5Q&list=PLsJWgOB5mIMCJEYAgBOJQN4ZfYunCMZ92)
   1.6. Network Theory: (https://www.youtube.com/watch?v=7HkXkAZye1Y&list=PLsJWgOB5mIMAuH3cHa-MXukX6-RPpDXgl)

2. **Complexity Explorer** (https://www.youtube.com/user/ComplexityExplorer)
   2.1. Introduction to Complexity (https://www.youtube.com/watch?v=Eo5oQ9Psmg8&list=PLF0b3ThojznRyDQlitfUTzXEXwLNNE-mI)
   2.2. Agent-Based Modeling (https://www.youtube.com/watch?v=YOGKSL7GuOE&list=PLF0b3ThojznRKYcrw8moYMUUJK2Ra8Hwl)
   2.3. Dynamical Systems and Chaos (https://www.youtube.com/watch?v=9ZI4edcv_uY&list=PLF0b3ThojznQwpDEClMZmHssMsuPnQxZT)
   2.4. Fundamentals of Machine Learning (https://www.youtube.com/watch?v=6qrTjzqxQsg&list=PLF0b3ThojznRzE8oKplowJ7N-jkHzt6kP)
   2.5. Fundamentals of Net Logo: (https://www.youtube.com/watch?v=lJgurmQ0SVA&list=PLF0b3ThojznQ15cjVXT7-TLVDbCQ0q109)