

アカデミック向けシステム・ダイナミクス上級コース 2018

Advanced Academic System Dynamics Course 2018

共催：システム・ダイナミクス学会日本支部

Cosponsored by the Japan Chapter of the System Dynamics Society

東京都千代田区神田神保町 3-8 専修大学神田キャンパス

7月28日（土曜日） 10:00 - 17:00. 7号館 773 教室.

7月29日（日曜日） 10:00 - 17:00. 7号館 771・773 教室.

Kanda Jinbo-Cho, 3-8, Chiyoda-Ku, Tokyo. Senshu University, Kanda Campus.

<https://www.senshu-u.ac.jp/access.html>

July 28 (Sat). 10:00 - 17:00. Building No. 7, Room No. 773

July 29 (Sun). 10:00 - 17:00. Building No. 7, Room No.771・773

講師：マーティン・クンク・ホラシオ. Martin Kunc Horacio.

英国ワーウィックビジネススクール、オペレーションリサーチ&マーケティングサイエンス研究科 准教授. <https://www.wbs.ac.uk/about/person/martin-kunc>

システム・ダイナミクス学会英国支部より Geoff Coyle 賞受賞（2015）

日本学術振興会平成30年度外国人招へい研究者（長期）、長野大学客員研究員

1 日目のテーマ：SDに焦点を当てた原稿出版のための基本ステップ

- ① 専門誌（ジャーナル）向け学術論文出版のための基本ステップ
- ② 出版物に関するシステム・ダイナミクス（SD）の簡潔な歴史紹介
- ③ 現代的な学術の潮流およびSDの潮流

（※）参加者は作成中／投稿予定の原稿を持参することが望ましい。本文は日本語でもよいが、概要は英語記述を用意すること。投稿候補誌名を2, 3誌位挙げておく。

（※）参加登録者には関連資料配置場所（Dropbox フォルダ）を事前に通知します。

（※）休憩時間は1時間おきに15分です。昼食時の休憩時間は1時間です。

2 日目のテーマ：SD研究者のための研究領域の発展

- ① SDと最適化の利用のための方法論的側面
- ② ハイブリッドモデルにおけるSDの利用のための方法論的側面
- ③ 行動科学および保健医療分野におけるSDの利用についての簡潔な議論

（※）参加登録者には関連資料配置場所（Dropbox フォルダ）を事前に通知します。

（※）休憩時間は1時間おきに15分です。昼食時の休憩時間は1時間です。

An Advanced Academic System Dynamics Course – July 2018 - Japan

Martin Kunc,

Associate Professor, Operations Research and Management Science, Warwick Business School
2018 JSPS International Research Fellow



Biography:

Martin Kunc obtained his PhD in Decision Science from London Business School supervised by Professor John Morecroft in 2005. He has published more than 25 papers in journals and book chapters using System Dynamics. The articles appeared in journals such as System Dynamics Review, European Journal of Operational Research, Journal of the Operational Research Society, Strategic Management Journal, International Journal of Wine Business Research, Systemic Practice and Action Research and Technological Forecasting and Social Change. He is currently Associate Professor of Management Science at Warwick Business School, University of Warwick, UK. Recently he has edited a book presenting System Dynamics as a soft and hard Operational Research methodology (OR Essentials Series – System Dynamics: Soft and Hard Operational Research 2016, Springer) with more than 15 papers from highly recognised authors published in the Journal of the Operational Research Society over the last 20 years. He has also edited a special issue in “System Dynamics from the perspective of other modelling methods” to appear in the Journal of Simulation (Taylor&Francis/Operational Research Society journal) together with John Morecroft and Sally Brailsford. Martin Kunc has received the Geoff Coyle Medal for the long-term contribution to the System Dynamics field presented by The UK Chapter of the System Dynamics Society.

Outline for Day 1 (July 28) - Basic Steps for publishing the manuscript featuring SD

The purpose of this day is to introduce you to the design of research projects featuring system dynamics (SD) with the intention of publishing them in a manuscript in an academic journal. The day includes lectures and short exercises. Participants are encouraged to submit a copy of your current paper for discussion during the day. While the paper must not be in English, the abstract should be in English. You also need to indicate two/three potential journals.

The agenda for the first day is the following:

1. **Mapping the System Dynamics field.**
 - How many fields have used System Dynamics?
 - What are the areas mostly covered by System Dynamics papers?
 - What are the differences between qualitative and quantitative System Dynamics research?
2. **Preparing your manuscript for publication.**
 - What should you include in your *introduction*?
 - What is an adequate *literature review*?
 - Where and how do you explain your System Dynamics model (*research method*)?
 - What *results* should you communicate in your paper?

What should be included in the *discussion*?
What should be included in the *conclusions*?
Do you need an *appendix*?

3. **Examples of papers published and your own papers will be used during the day.**
What were the critical aspects of a paper published?
How was the process?
For potential papers, what are the target journals? Why?
4. **Existing opportunities for publication.**
Information about coming special issue in the Journal of Modelling in Management for 2019
Information about the Journal of Simulation.

PRELIMINARY READINGS

- M Kunc 2017. System dynamics: A soft and hard approach to modelling, Winter Simulation Conference (WSC), 597 – 606
- Repenning (2003), Selling system dynamics to (other) social scientists, System Dynamics Review, 19, 4, 303-327.
- M Kunc, M J. Mortenson, R. Vidgen, 2018. A computational literature review of the field of System Dynamics from 1974 to 2017. Journal of Simulation.

NON-MANDATORY READINGS

- M Kunc, F A.O'Brien 2017. Exploring the development of a methodology for scenario use: Combining scenario and resource mapping approaches, Technological Forecasting and Social Change, Volume 124, 150-159.
- M Kunc, J. Morecroft (2010), Managerial Decision-Making and Firm Performance Under a Resource-Based Paradigm, Strategic Management Journal, 31(11), 1164-1180, 2010.
- J P Torres, M Kunc, F A. O'Brien, F. (2017). Supporting strategy using system dynamics. European Journal of Operational Research, 260(3), 1081-1094.

PRINCIPAL TOPICS OF STUDY

Basic Steps for publishing the manuscript featuring SD

- 1) basic steps of publishing the manuscript in the academic journal
- 2) brief history of SD in terms of publications
- 3) modern academic trends and SD trend

Outline for Day 2 (July 29) – Developing areas of research for SD researchers

A discussion of System Dynamics with respect to how to optimise System Dynamics models. There are two basic uses of optimization in System Dynamics. First, models can be optimized for the calibration of parameters against data. Second, policies can be optimized using different payoffs functions. A demonstration on how to implement optimisation will be offered.

A discussion of using System Dynamics as part of hybrid models will be offered. Hybrid models are becoming mainstream due to the existence of more flexible software. Hybrid models involve

combining System Dynamics, Discrete Event Simulation and Agent Based Model. Presentation of recent works and explanation of the methods to develop hybrid models will be offered.

Finally, applications of System Dynamics in promising areas: Healthcare and Behavioural Operational Research are discussed.

The agenda for the second day is the following:

1. **Optimisation in SD.**
What is optimisation?
Why is used?
What is the purpose?
2. **Hybrid modelling.**
What is hybrid modelling?
What is the role of SD in hybrid modelling?
3. **Healthcare.**
What are the strengths of SD in healthcare?
Areas of applications of SD in healthcare
4. **Behavioural Operational Research.**
What is SD offering to behavioural operational research?
How to implement research in SD looking at behavioral problems?

PRELIMINARY READINGS

- Introduction chapter in Rahmandad, H., Oliva, R., Osgood, N.D. and Richardson, G., 2015. Analytical Methods for Dynamic Modelers. MIT Press.
- Chapter 3 and 5 in Kunc, M., Malpass, J., White, L. (Eds.), 2016. Behavioral Operational Research: Theory, Methodology and Practice . Palgrave
- Morgan, J.S., Howick, S. and Belton, V., 2017. A toolkit of designs for mixing Discrete Event Simulation and System Dynamics. European Journal of Operational Research, 257(3), pp.907-918.
- Brailsford, S., Eldabi, T., Kunc, M., Mustafee, N., Osorio, D. 2018. Hybrid Simulation Modelling in Operational Research: A State-of-the Art Review. European Journal of Operational Research
- Kunc M, Kazakov, R. 2013. Competitive dynamics in pharmaceutical markets: A case study in the chronic cardiac disease market. Journal of the Operational Research Society 64, 1790–1799

PRINCIPAL TOPICS OF STUDY

Methodological aspects of using Optimisation and System Dynamics.

Methodological aspects of using System Dynamics in hybrid models.

A brief discussion of System Dynamics use in behavioural research and healthcare.

EXPECTED TIME SCHEDULE FOR BOTH DAYS

10 AM – Start first part

11 AM – Finish first part

15 minutes break

11:15 AM – Start second part

12:15 PM – Finish second part

Lunch time

13:15 PM – Start second part

14:15 PM – Finish second part

15 minutes break

14:30 PM – Start third part

15:30 PM – Finish third part

15 minutes break

15:45 PM – Start discussion and conclusions of the day

16:45 PM – Closure

NOTICE FOR THE PARTICIPANTS

The references of this course will be informed through the Dropbox sharing folder.