## Hand-out Seminar MSc: The Beer Distribution Game and Artificial Intelligence

#### Winter term 2018/19, version: 15 October 2018

Please note: This document reflects our planning before the term started; it will **not** be updated regularly. For short-term changes regarding rooms or times, see Campus. Changes regarding the content will be discussed in class and, if appropriate, communicated via Ilias.

#### Learning objectives

After successfully finishing the course, students can:

- independently understand a scientific paper;
- summarize and criticize a scientific paper;
- put a scientific paper into context with regard to broader discussions in the field of operations management;
- moderately extend a paper (e.g., by extending a model, adding statistical analyses, or formulating further research questions);
- give an academic presentation.

### <u>Content</u>

The seminar asks students to independently acquire knowledge based on a scientific paper. This paper has to be understood, summarized, criticized, extended and put into context. Students hold a presentation about their understanding and findings.

#### **Requirements**

One course in the master elective "Operations Management" successfully passed.

#### <u>Literature</u>

Students are requested to choose one scientific article from the following list, on which their seminar paper and presentation will be based:

- Carbonneau, Real, Kevin Laframboise, Rustam Vahidov: Application of machine learning techniques for supply chain demand forecasting, *European Journal of Operational Research* 184 (2008), 1140–1154.
- 2. Chaharsooghi, S. Kamal, Jafar Heydari, S. Hessameddin Zegordi: A reinforcement learning model for supply chain ordering management: An application to the beer game, *Decision Support Systems* **45** (2008), 949–de959.

- 3. Chen, Hsiao Ching, Hui Ming Wee, Kung-Jeng Wang, Yao-Hung Hsieh: Using artificial neural network in multi-agent supply chain systems, Third International Conference on Natural Computation (ICNC 2007), IEEE.
- 4. Kimbrough, Steven O., D. J. Wu, Fang Zhong: Computers play the beer game: can artificial agents manage supply chains?, *Decision Support Systems* **33** (2002), 323–333.
- 5. Odonnell, Tina, Liam Maguire, Ronan Thomas Mcivor, P. Humphreys: Minimising the Bullwhip effect in a supply chain using genetic algorithms, *International Journal of Production Research* **44** (2006), 1523–1543.
- 6. Oroojlooyjadid, Afshin, MohammadReza Nazari, Lawrence V. Snyder, Martin Takac: A deep Qnetwork for the beer game: a reinforcement learning algorithm to solve inventory optimization problems, arXiv:1708.05924v2, 8 Mar 2018.
- 7. [Pathak, Surya D., Jamison M. Day, Anand Nair, William J. Sawaya, M. Murat Kristal: Complexity and Adaptivity in Supply Networks: Building Supply Network Theory Using a Complex Adaptive Systems Perspective, *Decision Sciences* **38** (2007), 547–580.]
- 8. Prestwich, S.D., S.A. Tarim, R. Rossi, B. Hnich: A neuroevolutionary approach to stochastic inventory control in multi-echelon systems, *International Journal of Production Research* **50** (2012), 2150–2160.
- 9. Yoo, Jang Sun, Seong Rok Hong, Chang Ouk Kim: Service level management of nonstationary supply chain using direct neural network controller, *Expert Systems with Applications* **36** (2009), 3574–3586.

## <u>Timetable</u>

Date, time	Торіс	Room
22/10/2018,	Kick-off: explanation of procedures and topics	7.013
11:00-12:00		
19/11/2018,	How to write a seminar paper	7.013
17:30-19:00		
14/11/2018 -	Please register on C@mpus for examination	
06/12/2018		
26/11/2018	Intermediate oral presentation & discussion: outline,	7.013
10:00-13:00	progress, questions	
17/12/2018,	How to give a seminar presentation	7.013
17:30-19:00		
01/02/2019,	Presentation of seminar papers; deadline for submitting	7.013
09:45-15:00	papers and presentation material	

# Intermediate supervision

During the period of writing the seminar paper and preparing the presentation, advice can be sought with the research associates of the department, Mr Brauch and Mr Đula in KII, 07.005, Tuesdays and Wednesdays 10:00–12:00. It is advised that students use this opportunity two or three times but not more than five times.

#### **Examination**

Student assessment is based on a written and an oral examination: seminar paper and seminar presentation. Weight: seminar paper 60%, seminar presentation 40%.

The seminar paper should not be longer than 12 pages (or 15 pages including cover sheet, table of contents, and literature list), font size 12 points, font type Times New Roman, line spacing 1.5, margins 2.5 cm (top and bottom) and 2 cm (left and right). Please provide page numbers. The cover page should include the title of the paper, the student's name and matriculation number. Please provide an electronic (on Ilias) as well as a paper version before the presentations (i.e., deadline: 1 February 2019, 09:45). With regard to the criteria for a good paper, please check the learning objectives. A structure with more than five sections or more than two levels of sub-sections is not useful for a seminar paper. More information on formal requirements can be found at https://www.bwi.uni-stuttgart.de/studium/pdfs/Zitierrichtlinien.pdf.

The seminar presentation should not be longer than 15 minutes. Thus, it must focus on the importance and relevance of the topic being discussed, the most important findings within the paper, and a criticism and extension of these findings. Powerpoint slides are a possible way to support the talk but other forms (e.g., speech with hand-outs, Prezis, posters, Pecha-Kuchas, model walk-throughs) are also encouraged but must be organized by the students. Presentation material must be made available to the teachers for assessment. Students should be prepared to answer questions regarding their presentation and paper.