The automotive industry is one of the most important business sectors worldwide: over 60 million cars, vans, trucks and buses were produced in 2012, leading to turnovers of more than 1.8 trillion €. At the same time, it is one of the most challenging industry sectors. The automotive manufacturers are faced with highly demanding customers, fierce competition, a constant need for technological advancements and for global sourcing. Customized vehicles need to be produced as fast as possible while using minimal quantities of resources and materials. Additionally, the automotive manufacturers need to cope with emerging trends in the society: the increased focus on sustainability aspects, the move from petroleum-based fuels and the implementation of new mobility concepts such as car sharing.

The utilization of state-of-the-art planning methods can help automotive manufacturers cope with some of the aforementioned challenges.

The objective of the seminar is to study different applications of planning methods in the automotive industry based on the current state-of-the-art articles in scientific literature. Using selected scientific publications, the students will understand problems specific to the automotive industry and investigate various modeling and solution techniques to solve these problems. Industry presentations will provide first-hand insights on current development in the automotive industry.
Course Objectives

- Review the papers that belong to a topic. Topics will be assigned to the students in class.
- Critically evaluate the scientific contributions and compare it to other approaches proposed in literature. For this purpose do a literature research on your own.
- Apply literature findings and/or methodology to examples or case studies. Demonstrate your results.
- Develop ideas for future research and identify open questions.

Assignments

- Write and present a scientific report about your topic relating to the four course objectives (max 25 p (Times New Roman 12pt)). Details on the report writing see separate documents.
- Present your scientific report (max 30 min)
- Read the report of another group, prepare feedback and questions (2 slides)
- Engage in scientific discussion

Comments

- Students work in groups of 2.
- Class attendance is compulsory.
Schedule

Tuesday, 14.04.2015, 17h00 – 20h00
Location: 0544, (Building 0505)
Kick-off meeting:
- Introduction to the course
- Introduction to a range of problems in the automotive industry
- How to write a report?
- Presentation and assignment of the topics to the students

Tuesday, 05.05.2015, 16h45 – 18h15
Location: tba
- Industry presentation: Mathias Quetschlich (MAN Bus&Truck AG)

Monday, 11.05.2015, 09h00-18h00
Location: 1517/1519, (Building 0505)
- Intermediate student presentations, discussion.
  Each group will be assigned to an individual time slot

Monday, 15.06.2015, 12h00
Location: Room 1536 (Building 0505), Mrs. Wagner (Secretary Prof. Grunow)
- Deadline for report and presentation hand-in
- Hand-in 2 paper copies of the report and presentation
- Upload your electronic version (Pdf) to turnitin. Details will be announced during the seminar.
- Also email to sina.wochner{at}tum.de, subject: “Automotive Seminar SS15”

Monday, 20.06.2015, 7h00
- Deadline for feedback and questions on the report of another group (2 slides)
- Email to sina.wochner{at}tum.de, subject: “Automotive Seminar SS15”

Monday, 20.06.2015, 09h00-18h00
Location: Room Z534 (Building 0505)
- Student presentations, discussion

Tuesday, 23.06.2015, 12h00-18h00
Location: Room 1503 (Building 0505)
- Student presentations, discussion

Thursday, 25.06.2015, 13h15-18h00
Location: Room 0544 (Building 0505)
- Student presentations, discussion

Friday, 26.06.2015, 09h00-18h00
Location: Room 1503
- Student presentations, discussions
Consultation hours (seminar)
Paul Jana, Wednesday, 09.00 – 10.00 (please email before)
Radu Popa, Tuesday, 09.00 – 10.00 (please email before)
Sina Wochner, Wednesday, 09.00 – 10.00 (please email before)
Selected Topics for the Automotive Seminar

Overview of Planning in the Automotive Industry


Strategic Network Planning

1. Strategic Network Planning


Customer Segmentation

2. Implementation of customer segmentation methods


Research and Development

3. Decision support for vehicle testing


Product Variety

4. Product variety management


5. Modularity in product design


6. Option bundling design


Sales and Operations Planning

7. Sales and operations planning in the automotive industry


8. **Tactical supply chain planning in the automotive industry**


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**Assembly Planning**

9. **Reconfiguration of assembly lines**


10. **Kitting versus line stocking**


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**Production Planning**

11. **Organizational capacity planning in the automotive industry**


12. Master production scheduling in the automotive industry


Sequencing of Assembly Lines

13. Sequencing mixed model assembly lines – approaches, models & algorithms


Emerging Trends

14. Models for the development of car sharing networks


15. Implementation of sustainability aspects in the automotive industry