

Education/SPM955xABMofCAS/StudentPages.Spm955

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This is the Spm9550 Exam, academic year 09/10.

- Set ALLOWTOPICCHANGE = SPM955xTeacherGroup

⚠ If you are a student, and you see this page **before Tuesday , 6 July, 12:00** please report that to IgorNikolic. This will earn you a bonus point. ⚠

⚠ Work in progress, not final version yet

OpenQuestion?

This question is worth 10/100 pts. Guideline 300 ~ 500 words.

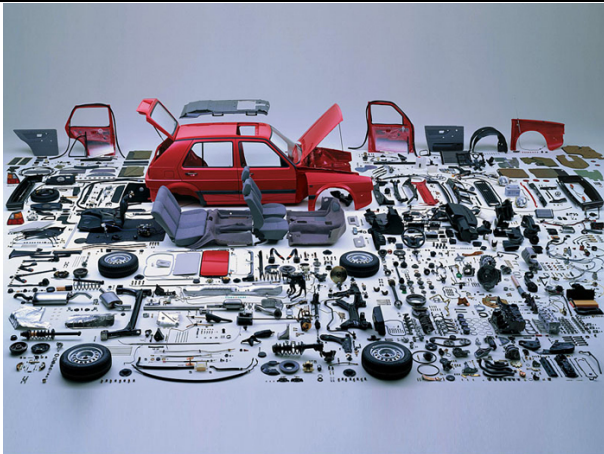
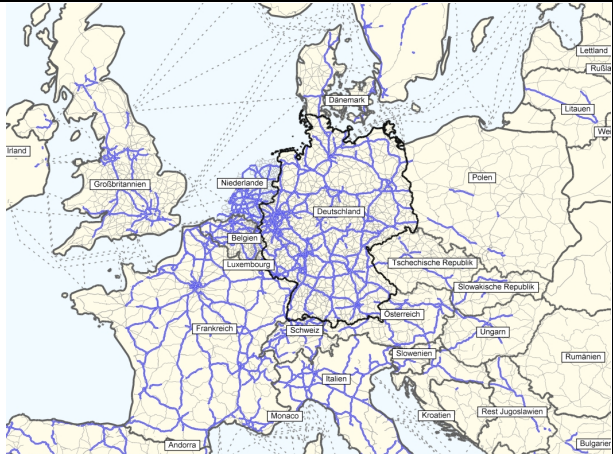
You were free to prepare the answer to this question in advance.

One of the Course Goals of SPM 9550 is a change in attitude, whereby "Students should be able to reflect on the traditional engineering systems thinking from the CAS perspective and understand the implications of changing the traditional perspective.". Discuss and give examples.

Question 1

This question is worth 15/100 pts. Guideline: 200 words.

Please compare an car and the road network, presented below. Please identify which system is complex, which is complicated. Why ? Is it possible to make that distinction? Why? Discuss.

Car	Road network
A car has according to some counts 15000 to 20000 parts	There are 6.279 Milion km of roads in europe
	

Question 2

This question is worth 25/100 pts. Guideline: 400 words.

Consider the Team Assembly model, that you can find in NetLogo. Using the default model, a parameter sweep experiment was performed and a number of model metrics were recorded.

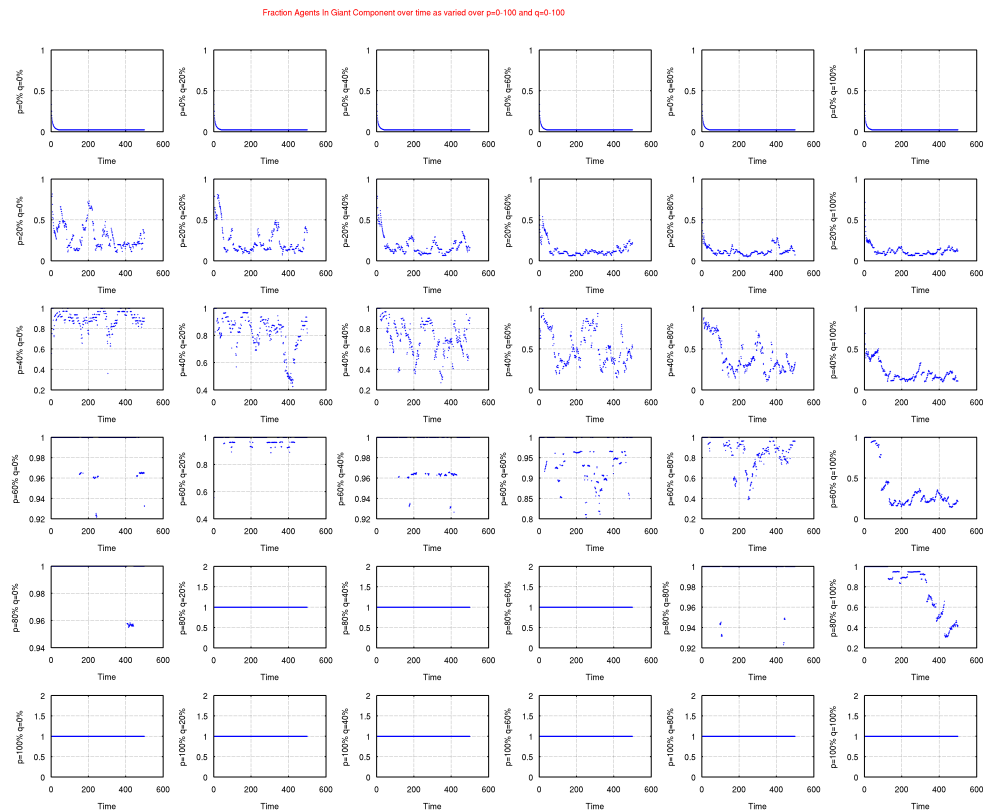
The parameter sweep consists of :

- Team_AssemblyExam-6-07-2010.nlogo: Team Assembly model and experiment used to generate exam data
- P and Q parameter varied from 0% -100% in 20 % increments

- 500 time steps
- Values at all time steps are saved

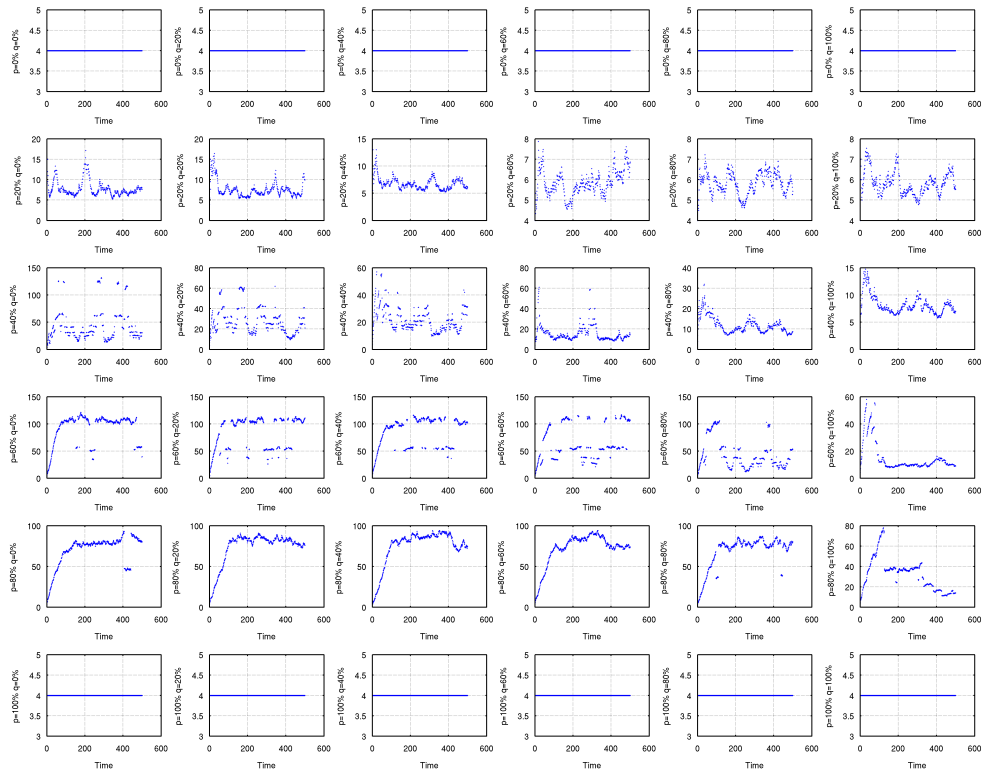
Please elaborate on :

- What do the results tell us ?
- Which type(s) of complex system behavior do you observe and what are the mechanisms causing them?
- Comment on the main elements that are missing from this analysis?
- What would you advise as the best way to collaborate in scientific work based on this model?
- Fraction of Agents In Giant Component



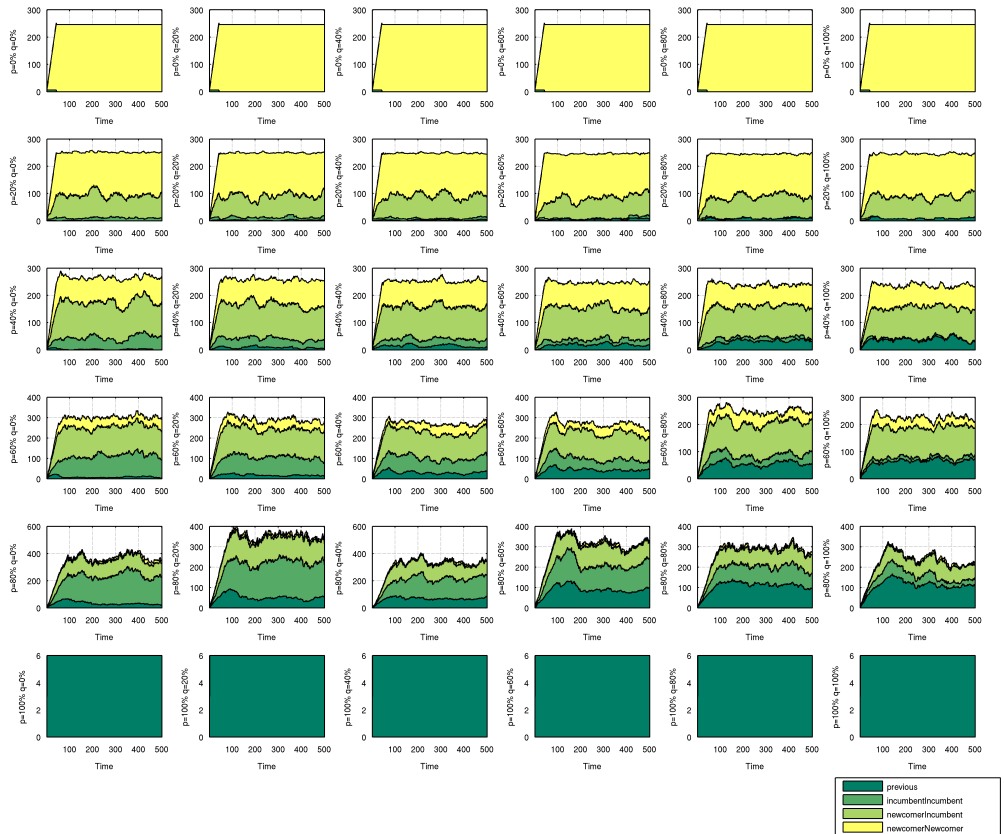
- Average Component Size

Average Component Size over time as varied over $p=0-100$ and $q=0-100$



• Cumulative Link counts per type

Link fractions per type, over time as varied over $p=0-100$ and $q=0-100$



Question 3

This question is worth 15/100 pts. Guideline: 200 words.

Explain how path dependency and chaos relate to the phenomenon of Football hooliganism

- What are path dependency and chaos ?
- Why are they relevant to the football hooliganism ?

Question 4

This question is worth 20/100 pts. Guideline: 400 words.

Nuclear arms race has brought humanity to a brink of nuclear war. It is therefore important to understand and, if possible, prevent it. Please describe a generative experiment that would have the ability to grow the pattern of a nuclear arms race. If you do now know a lot about geopolitics, feel free to make reasonable assumptions, but make them explicit. Discuss:

- What are the agents, their states and rules?
- What kind of experiments could you perform?
- How would you validate such a model?

Question 5

This question is worth 15/100 pts. Guideline: 200 words.

Viral videos and Internet Memes are so called viral phenomena. Some examples are :

- LOLcats
- Rickroll
- Chocolate Rain

Discuss how internet memes and viral videos are complex phenomena. Please introduce as many relevant theoretical concepts as you can and explain how they fit in.

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