

Homework Assignment #5

(February 3, 9:30 am)

Since I will be out of town, no hardcopy, see below.

1. Hand in your final version of your bibliography/model, which will be graded. As guideline for your revisions and further work on your project use my comments to your first version of your bibliography/model. As before for your first version, the final version of your bibliography/model should include:

- references of at least five scientific papers which specify model & background of your project
- at least one book
- any further references, which are necessary to define your model precisely and which provide the information about previous work on the topic of your project
- hard-copy of paper(s) which describes best the model you will use (In case of a book being your major source, just make a copy of the appropriate page(s). In case you will develop your own model, then make copies of the appropriate references which identify the main parameters and known facts you will use.)
- Describe the model of your project with as complete set of rules as possible (one or more pages; clearly hand-written notes are fine)

To be able to hand-in your bibliography/model on-line: (1) For hardcopy of major paper (book pages), keep in mind to focus only on your model. (2) scan in your pages to make a pdf-file of it and please send complete pdf-file (so one pdf-file for each person) to me Feb.3, via email (kvollmay@bucknell.edu). In case of question for how to scan in, please ask Sandy how to do it with our copier.

Homework Assignment #6

(February 10, 9:30 am, beginning of class)

1. Start reading the papers which you found for your project to acquire the necessary knowledge for the background/method section(s) of your paper. Answer to this question should be “done” (although this is work which is never finished for ongoing research topics :-).

2. Tuesday, Feb. 10 at the beginning of class, hand in the first version of your background/intro/methods section. Please note that this is not the complete paper, but only the section background/intro/methods section. For more information see “paper” on our course-webpage (and backside of this page). and my comments to your first version of bibliography and model. (For now detailed hand-written notes are fine, or latex or word-document notes. What counts is the content. Tuesday, Feb.10, I will introduce (or remind you of) the tool for formatting your scientific paper, that is latex.)

Paper

Use the following description of a scientific paper as guideline for the two papers of your main project. The first paper should include the title, the “introduction/background”, the “model/method” and the “references”, which are cited in these parts of the paper. In the second and final paper you will write the complete paper (revisit the sections of the first paper for changes.) For both papers use a more formal writing style than you will use in your oral presentation.

Audience: Your audience will be physics juniors and seniors who most likely do not have your background. Include therefore all information which is necessary to understand your project.

Examples:

- D. Chowdhury, L. Santen and A. Schadschneider, “Vehicular Traffic: A System of Interacting particles Driven Far From Equilibrium,” Curr. Sci. India **77**, 411 (1999).
- all scientific papers you have read for your project.

Contents:

- Title
- Author(s), Address
- Abstract: An abstract is a summary of what you did and your results. The abstract is for a reader who might not have time to read the rest of your paper or who decides depending on your abstract if she or he reads the whole paper. The abstract should be understandable without the rest of the paper and should contain: the system you study, the model, the method and the results.
- Text: The following text should be understandable by itself. Reference any information which you used from other sources or which includes details not necessary for the reader’s understanding.
 - Introduction/Background¹:
This section might give some historical background and/or necessary background information. You might talk about other models than the one you use. The Introduction also serves as a motivation for why your project is of specific interest and importance. The main purpose of the introduction is to put your project into context: What has been done in previous work? Which models have been used? Which experiments have been done? Which theory has been done? What were the results? Which of the models are you using, or if you build your own model, what are the reasons for altering the previously used models? As part of the introduction you might give a general description of your project. You might end your introduction with an outline of the rest of the paper.
Please note my comments on your bibliography/model papers for a more specific description of this section for your project.

¹Sometimes this is split into two sections

- Model:
In this section you describe your model exactly. This includes for example the dimension of your system, whether you use a lattice and all applied rules (as e.g. the steps in the Nagel-Schreckenberg traffic flow model). In principle, after reading your description any reader should be able to write the program for exactly the same model as yours. For a more specific description what this section should contain for your projects, use my comments to your bibliography/model.
- Theory:
You may not need this section. This is a section one uses if there are analytical calculations possible. For theoreticians this is the main section.
- Simulation:²
This section includes the method you use. For the second paper you will include in this section a specification of all parameters used in your simulation. Your description needs to specify all details which are necessary to reproduce your simulation results, for example for the traffic flow model you specify the initial configuration (how do you put on cars and which velocities do you give them), the number of time steps, the lattice size, and the boundary conditions (what happens at the ends of the road).
- Results:
This section describes the results of your project. It can include tables, formulae and figures. Tables and figures should have captions. Figure captions should have text which describes what the figure shows. All formulae should be numbered.
- Conclusions/Discussion:
In this section you draw conclusions of your results and you might include what one could do in future work.
- References:
This is the bibliography of all references to which you refer in the text.

²This section is often combined with the section “Model.”