University of Delaware -- Computer and Information Science
CISC829 – Computational Geometry

Student Lecture Instructions

Recall from the information sheet the requirement:

> *Each student will be involved in a group of 2 or 3 students who will be responsible for giving one 75 minute lecture. The groups will be assigned by the instructors in March. The lectures will take place in the last 8 class meetings of the semester. Lecture topics will be provided by the instructors*.

This handout provides some information on that lecture.

What is this about?

As noted above, each person taking the class for credit is required to give one lecture on a topic in computational geometry. The lectures will be prepared and given by ***students in their already assigned groups.*** The lecture format is entirely up to your group. The main thing is that you do a thorough and effective job of presenting some topic in, or related to, computational geometry. When the lecture is over, everyone in the class (especially the instructors!) should have a reasonably good idea about the algorithms/methods that you presented. How you do that is entirely up to you. Note though that it is especially important that the lecture be complete in providing the necessary background, definitions, applications, etc.

Timetable

Relative to your preparation for your lecture, here is a rough timetable:

- Three weeks prior to your lecture, prepare a roughly half-page outline of your lecture and go over it with either Jingyi or Errol.
- At least two weeks prior to your lecture, prepare a full set of lecture notes and go over them with Jingyi or Errol. Note that it is UP TO YOU on how much detail you include in your notes. They are for YOU, and not for anyone else. The only purpose of going over them with us is to make sure that the material will flow logically, etc.
- At least one week prior to your lecture, finalize the lecture notes. Practice the lecture by running it through in your head. KNOW what you want to say!

Grading

This lecture constitutes 20% of your course grade. The lecture will be graded in four areas, each worth one quarter of the total:

preparation correctness content delivery

Available Lecture Dates

Here is a list of the available dates for your lecture. Please contact Errol to select a date. Selection is first come, first served.

April 28, 30

May 5, 7, 12, 19, 21

Lecture Topics

Here is a list of possible lecture topics. If you would like to use one of these, please contact Jingyi or Errol – the topics are available on a first come, first served basis.

If you would like to cover a different topic from those listed below, that is fine, BUT, it must be approved in advance by the instructors, so you will need to contact us with your topic and see what we say. Note that topics covered in standard courses in graphs or vision will not be approved. Topics should either build on things covered in the course to this point or should have a strong algorithmic component in the area of computational geometry.

- Optimization problems in the plane - NP-completeness and approximation (e.g. packing, covering, Traveling Salesperson)
- Higher and High-dimensional LP
- GPU-based Voronoi Diagrams
- Duality in High-dimensional space, Plucker coordinates, 3D visibility
- Robot Motion Planning
- Discrete differential geometry
- Quadtrees and Non-Uniform Meshing
- Closest pair
- 3D Convex Hulls
- Smooth surface reconstruction