CS898 - On the Synergy between Computer Science and Biology

Winter 2020

Course Outline

University of Waterloo, School of Computer Science

Instructor: Gladimir V. G. Baranoski, DC 3520
Email: gvgbaran@cs.uwaterloo.ca

Lecture Times

Tuesday and Thursday, from 4:30 to 5:50 PM, DC 2568.

Course Website

http://pedrinho.cs.uwaterloo.ca/~gvgbaran/cs898-W20.html

Course Description

The main topics to be addressed during this course are the following:

- the use of computational methods to investigate and model biological systems, and

- the use of biological processes to derive solutions to computational problems.

Course Objectives

The main goal of this course is to explore the forefront of research involving the interaction between computer science and biology. This course will also examine from a practical point of view the traditional scientific methodology used in the search for solutions of problems in physical and life sciences.

Reference Materials

Selected papers and complementary texts will be provided in class and in the course web site.

Marking Scheme

- Participation in course activities (50%):

    - paper presentations (30%),

    - paper and video discussions (10%),

    - paper quizzes (10%).

- Course project (50%):

    - presentation (25%),

    - written report (25%).

- Important notes:

    - The deadline for the submission of the slides (pdf format) for paper and project presentations is **4 PM** on the due dates specified in the course schedule (available in the course website).

    - Students should submitted both an electronic (via email) and a hardcopy of their project proposal and project written report. The electronic copies should be also submitted by **4 PM** and hardcopies should be submitted in class on the due dates specified in the course schedule (available in the course website).

    - Course materials submitted after these deadlines will result in mark deduction (50%).

    - Quizzes will be returned in class.

The students will be encouraged to select project topics related to their own thesis' theme and in line with the course main objectives.

Course Delivery and Expected Behaviour

For this offering, class attendance will be particularly critical. During the lectures, the use of personal computers or other devices, like phones, is not allowed, except when directly authorized by the instructor. Violation of this guideline will result in the loss of participation marks (25%). Systematic violation of this guideline may result in course dismissal at the instructor's discretion.

Rules for Group Work

Group work is allowed.

University Mandatory Information

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check *www.uwaterloo.ca/academicintegrity/* for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, *www.adm.uwaterloo.ca/infosec/Policies/policy70.htm.* When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity [check *www.uwaterloo.ca/academicintegrity/*] to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about 'rules' for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, *www.adm.uwaterloo.ca/infosec/Policies/policy71.htm.* For typical penalties check Guidelines for the Assessment of Penalties, at the following web site *www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.*

Appeals: A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) *www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.*

Note for Students with Disabilities: The AccessAbility Services Office (AAS), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AAS at the beginning of each academic term.

CS898 - On the Synergy between Computer Science and Biology

Winter 2020

Revised Course Schedule

University of Waterloo, School of Computer Science

Instructor: Gladimir V. G. Baranoski, DC 3520

Date	Activity	Presenter	Deadlines
Jan 7th	Course Guidelines and Goals	Instructor	
Jan 9th	Paper Reading: R1, R2 & R3	All	
Jan 14th	Paper Reading: R4, R5 & R6	All	
Jan 16th	Paper Reading: R7 & R8	All	Paper Selection
Jan 21th	Paper Reading: R9 to R11; Pres. Guidelines	All	
Jan 23th	Papers P1 & P2	Zeng & Amelia	Presentation Slides
Jan 28th	Papers P3 & P10	Moj & Nolan	Presentation Slides & Proj. Proposal
Jan 30th	Papers P5 & P6	Ramesh & Ajay	Presentation Slides
Feb 4th	Papers P7 & P8	Connor & Alex	Presentation Slides
Feb 6th	Papers P9 & P4	Aimilios & Guo	Presentation Slides & Paper Selection
Feb 11th	Paper Reading R16 & R17	All	Paper Selection
Feb 13th	Papers P34 & P29	Aimilios & Guo	Presentation Slides
Feb 18th	*Reading Week*		
Feb 20th	*Reading Week*		
Feb 25th	Proj. Status & Guidelines	All	Proj. Time Selection
Feb 27th	Papers P24 & P33	Connor & Alex	Presentation Slides
Mar 3rd	Papers P17 & P31	Ramesh & Ajay	Presentation Slides
Mar 5th	Papers P21 & P16	Amelia & Nolan	Presentation Slides
Mar 10th	Cobwebs ...	Special Guest	
Mar 12th	Nature & Math	Special Guest	
Mar 17th	Papers P35 & P13	Zeng & Moj	Presentation Slides
Mar 19th	Obstacles & Perspectives	Special Guest	
Mar 24th	Project Presentation	All	Project Slides
Mar 26th	Project Presentation	All	Project Slides
Mar 31st	Project Presentation	All	Project Slides
Apr 2nd	Course Conclusion	Instructor	Project Written Report

Important Notes:

- The deadline for the submission of the pdfs of papers and project presentation slides is **4 PM** on the days specified above.

- Students should submit an electronic copy (pdf, via email) of their project written report. The electronic copies should be also submitted by **4 PM** on the day specified above.

- Course materials submitted after these deadlines will result in mark deduction (50%).

- Quizzes will be returned in class.