

ICS 691 - Special Topics Computer Science

Artificial Intelligence in Medicine and Biology

Fall 2013

Details: Course number: ICS 691, Section: 2, CRN: 79913, Time: Mon and Wed, 10:30-11:45 am, Location: POST 318B, Credits: 3.

Instructor: Prof. Nancy Reed, POST 314E, nreed@hawaii.edu

Course Description: This course gives students an overview of Artificial Intelligence (AI) techniques used in medicine and biology. Practical applications of AI range from decision support systems for diagnosis to modeling physiologic processes, to analyzing human and animal DNA. Students in the course gain an in-depth practical experience by completing a course project on a topic of their choice.

Textbook: Book TBD. Selected papers from journals (e.g. Artificial Intelligence in Medicine, the journal of the American Medical Informatics Association) and conferences/workshops (e.g. AAAI, AIMA, AIME and IJCAI).

Prerequisites: Programming experience in one or more programming languages is necessary. Experience in artificial intelligence and/or biomedicine is useful, but not required.

Course Objectives: A student should understand (i) the fundamental concepts needed to apply AI techniques including knowledge representation and reasoning methods in medicine and biology, (ii) the principles of designing systems to solve problems, (iii) gain an in-depth understanding of concepts working with an existing biomedical system, and (iv) understand how to analyze and design systems for new problems. A student should be able to decide if a non-trivial problem can be solved effectively using existing techniques, and if so, design and implement a prototype system to solve the problem.

Term Project: The term project can include a literature review and/or an experimental/programming project. The programming project may include the development (or modification) of a system, testing a system on new data sets, or a comparative evaluation of one or more AI software systems in an application area of your choice. All projects require a written proposal, progress report including references, a midterm and final presentation in class, and a final report.

Grading: Grades are based on participation in class including the presentation and discussion of research papers (25%) and completion of a term project (75%), including a final written report and an oral presentation open to the public.