CSE 731 – A Review of Sp05 Offering

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Outline

- Salient Points of Sp05 Offering
- CSE Capstone Criteria – how they were met
- Summary

Salient Points - Logistics

- Course taught once a year in Spring Quarter.
- Currently taught by lecturer (Prasad)
  - Eric recently appointed course coordinator to give faculty input
- Met MW for 1.5 hours
- 22 students enrolled in Sp05
  - 20 undergrads
  - 2 grads

Salient Points - Course

- The course consists of:
  - Lectures from instructor
  - Group discussions on project progress
  - Group presentations of project
  - Interaction with domain expert (IMPORTANT!)
- Single, group, quarter-long project
  - Described more extensively in the next slides
- Lectures in first part of class cover necessary expert system material
  - Review of 560/630 (software engineering & AI) in light of expert systems
  - Representation of time, space, and uncertainty in expert systems
  - Classification techniques
  - Expert system architectures
  - CLIPS programming language
    - Much of this is learned by students on their own
- Homework was based on questions from text on these topics
- One midterm exam in Week 5 on lecture material

Salient Points - Projects

- Collaborative decision making in selecting projects
  - Students worked together to choose an initial list of projects
  - Collaborative decision processes used to select final project
  - Instructor insures that project can be completed within 5-6 weeks
- Teams of 4 included students representing each of the stakeholders
  - User community, programmer, knowledge engineer, documentation expert
  - Each team was assigned/found a domain expert for their problem
- This years' projects
  - **Academic councilor for engineering** - help students (users) decide the engineering department for their study based on their aptitude and interest
  - **Army recruiter** - helps the candidates in identifying all the areas they are eligible for based on their background
  - **Mortgage advisor** - based on the user inputs (financial background) the system advises on the mortgages
  - **Video game advisor** - based on the user inputs (interest, machine, operating system, etc.), the system presents a list of video games for him to play
  - **Financial advisor** - given the income, short term commitments and long term goals, the system advises on the investment options
  - **Medical diagnostics** - identifies the probable sexually transmitted deceases for a given set of symptoms

Salient Points - Projects

- Latter part of course spent primarily in support of projects
  - Team meetings during class
  - Project reviews
- Project presentations during last week of class
  - Reports due at time of presentation

Salient Points - Grading

- Homework: 30 %
- Midterm exam: 35%
- Final Project: 35%
- Project Criteria
  - 10 page report required, outlining
    - Background of domain and task
    - Relations to other knowledge-based systems (if any)
    - What are the assumptions?
    - Knowledge-level analysis (protocols, knowledge hierarchy, data, rules)
    - Classification (methods, types of solutions, data)
    - Results of system
    - Assignment of work
  - Electronic submission of system
    - Includes sample runs of system
  - Group presentation
    - Each student is expected to participate in presentation
    - System is demonstrated during the presentation
- Project Grading
  - Report - 40 %
  - Code - 20 %
  - Presentation - 20 %
  - Process & Participation - 20 %

Evaluation against Capstone Criteria

- Walk through the 8 criteria…

CRITERION 1

- **Level -**
  Must be at the senior level.
- **Evaluation** – yes

CRITERION 2

- **Prerequisites -**
  Must include as prerequisites all relevant courses that are part of the CSE core or the option for which the capstone course is intended. Specifically, CIS 560, and at least one upper division course that is either in the CSE core or is in the required part of the option for which the course is intended, should be prerequisites. CIS 601 should also be a prerequisite (601 helps develop oral and written communication skills, and addresses important ethical and professional issues).
- **Evaluation** – Although not noted on the syllabus handed out to students, 601 and 560 are prerequisites. This will be corrected in the next iteration of the course. 630 (Intro to AI) is appropriately listed as a prerequisite both in the distributed and official syllabi.

CRITERION 3

- **Design** -
  Design must be the major component of the course. Students should explore and evaluate possible design alternatives.
- **Evaluation** - Collaborative decision making in design is a major component of the course. Students are encouraged to deliberate over potential projects and possible solutions before embarking on the final project. Similarly, project reviews are held to ensure exploration of design alternatives.

CRITERION 4 (1)

- **Course content –**
  The course must incorporate consideration of as many of the following issues as are appropriate to the course:
  - Realistic constraints: Students learn through the lectures about reasoning with realistic constraints, such as reasoning about time, space, or with uncertainty (the latter contributing the most to this criterion). These may or may not be applied in the final project. Students also design protocols to extract knowledge from an expert, and replicate her/his knowledge in a system. Issues such as time and effort resource constraints are discussed in the class and incorporated into the project.
  - Standards: Students develop their final project in CLIPS, an expert systems programming language that is a standard in the field. They also learn about standard protocols for extracting knowledge from experts.

CRITERION 4 (2)

- Maintainability: Students learn about robustness (or brittleness) in classification problems and how this leads to non-portability of systems to different domains. They also learn how to develop knowledge bases that can be shared by different applications. We talked about extensibility of the system and all the projects incorporate that in their design.
- Ethical, social, professional issues: 731 does not currently address these issues except briefly talking about it in the class. Coverage should be expanded to at least one full lecture.

CRITERION 5

- **Documentation -**
  Deliverables should include suitable documentation of both the design and any significant implementation performed in the project. The grading scheme should account for the quality of the documentation.
- **Evaluation -** One-quarter of the students' team efforts is dedicated to documenting the expert system design and building process. This information is distilled into the final report, which accounts for a significant proportion of the final project grade. The code base is also evaluated for readability in evaluating the final project.

CRITERION 6

Oral presentation:

Each student should be required to make at least one significant oral presentation (10 minutes or longer), or two or more shorter presentations about his/her design/implementation. The grading scheme should account for the quality of the presentation's), possibly using peer evaluation for the purpose.

Evaluation: The course provides each student at least 10 minutes of presentation time as part of the final project oral report. Evaluation of the presentation is made by the instructor; perhaps in future versions of the course we will also integrate a peer evaluation component.

CRITERION 7

Team working -

Students should be organized into appropriate teams for working on their design projects. Where possible, these teams should be multi-disciplinary.

Evaluation –

- We had only CSE students.
- Groups form themselves based on interest**.**
- Some groups worked well together.
- A good group is one where the final project was exemplary and all students contributed in an equitable way. Three groups did meet that criteria.
- One group did not follow the process or take advice.
- One member in one group did not participate in the group activities.
- Students did not grade each other. Maybe we should consider this.
- Did not have status report presentations -- maybe should include this.

CRITERION 8

- **Course size-**
  Enrollment in each section of capstone courses should be capped at 30 students.
- **Evaluation -**
  - Enrollment is capped at 30 students.
  - Sp05 class enrollment was 22.
  - The optimal group size was 4, but we had 2 groups of 3 (6 groups total)
  - Students form their own groups.

Summary

- **Recent adjustments to course have brought it in line with capstone requirements**
  - **More emphasis on projects**
  - **Oral presentations**
- **Might need more empahsis on ethical/social/professional issues.**
- **Student have varied experience in class, especially with the amount of effort they're willing to put in.**