CSCE 580: Introduction to AI
CSCE 581: Trusted AI

Lecture 26: Graduate Student Presentations

PROF. BIPLAV SRIVASTAVA, AI INSTITUTE

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Organization of Lecture 26

- Introduction Segment
  - Recap of Lecture 25

- Main Segment
  - Student Paper Presentations

- Concluding Segment
  - Course Project Discussion
  - About Next Lecture – Lecture 27
  - Ask me anything

Introduction Section

Recap of Lecture 25

- Topic discussed
  - Planning
  - Uncertainty
  - Reinforcement Learning

Where We Are in the Course

CSCE 580/ 581 – In This Course

- Week 1: Introduction, Aim: Chatbot / Intelligence Agent
- Weeks 2-3: Data: Formats, Representation and the Trust Problem
- Week 4-5: Search, Heuristics - Decision Making
- Week 6: Constraints, Optimization – Decision Making
- Week 7: Classical Machine Learning – Decision Making, Explanation
- Week 8: Machine Learning - Classification
- Week 9: Machine Learning - Classification – Trust Issues and Mitigation Methods
- Topic 10: Learning neural network, deep learning, Adversarial attacks
- Week 11: Large Language Models – Representation, Issues
- Topic 12: Markov Decision Processes, Hidden Markov models - Decision making
- Topic 13: Planning, Reinforcement Learning – Sequential decision making

- Week 14: AI for Real World: Tools, Emerging Standards and Laws; Safe AI/ Chatbots

Main Section

Presenters – Graduate Students

- Present paper 1-by-1

- Stay within 10 minutes

- After presentation, write your comments about the paper by Dec 5, 2023
  - What to have in the report – minimum 1 page per paper
    (<500 words).
    - Paper summary
    - Key contributions
    - Your critique about the paper.

Audience - Undergraduates

- Enter survey (vote) for each paper after presentation

- Select any 2 out of 5 papers
  - Write your comments about the papers by Dec 5, 2023
  - What to have in the report – minimum 1 page per paper (<500 words).
    - Paper summary
    - Key contributions
    - Your critique about the paper.

Course Project

Project Discussion: What Problem Fascinates You ?

- Data
  - Water
  - Finance
  - …

- Analytics
  - Search, Optimization, Learning, Planning, …

- Application
  - Building chatbot

- Users
  - Diverse demographics
  - Diverse abilities
  - Multiple human languages

Project execution in sprints

- Sprint 1: (Sep 12 – Oct 5)
  - Solving: Choose a decision problem, identify data, work on solution methods
  - Human interaction: Develop a basic chatbot (no AI), no problem focus

- Sprint 2: (Oct 10 – Nov 9)
  - Solving: Evaluate your solution on problem
  - Human interaction: Integrated your choice of chatbot (rule-based or learning-based) and methods

- Sprint 3: (Nov 14 – 30)
  - Evaluation: Comparison of your solver chatbot with an LLM-based alternative, like ChatGPT

Project Discussion: Dates and Deliverables

Project execution in sprints

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- Oct 12, 2023
  - Project checkpoint
  - In-class presentation

- Nov 30, 2023
  - Project report due

- Dec 5 / 7, 2023
  - In-class presentation

Skeleton: A Basic Chatbot

- Run in an infinite loop until the user wants to quit
- Handle any user response
  - User can quit by typing "Quit" or "quit" or just "q"
  - User can enter any other text and the program has to handle it. The program should write back what the user entered and say – "I do not know this information".
- Handle <u>known</u> user query types   // Depends on your project
  - "Tell me about N-queens", "What is N ?"
  - "Solve for N=4?"
  - "Why is this a solution? "
- Handle <u>chitchat</u> // Support at least 5, extensible from a file
  - "Hi" => **"Hello"**
  - …
- ***Store session details in a file***

Illustrative Project
1. **Title**: Solve and explain solving of n-queens puzzle
2. **Key idea**: Show students how a course project will look like
3. **Who will care when done**: students of the course, prospective AI students and teachers
4. **Data need**: n: the size of game; interaction
5. **Methods**: search
6. **Evaluation**: correctness of solution, quality of explanation, appropriateness of chat
7. **Users**: with and without AI background; with and without chess background
8. **Trust issue**: user may not believe in the solution, may find interaction offensive (why queens, not kings? …)

Project Discussion: Illustration

1. Create a private Github repository called "CSCE58x-Fall2023-<studentname>-Repo". Share with Instructor (biplav-s) and TA (kausik-l)

2. Create Google folder called "CSCE58x-Fall2023-<studentname>-SharedInfo". Share with Instructor (prof.biplav@gmail.com) and TA (lakkarajukausik90@gmail.com)

3. Create a Google doc in your Google repo called "Project Plan" and have the following by next class (Sep 5, 2023)

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1. **Title**: Solve and explain solving of n-queens puzzle
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Project Illustration: N-Queens

- Sprint 1: (Sep 12 – Oct 5)
  - Solving: Choose a decision problem, identify data, work on solution methods
    - Method 1: Random solution
    - Method 2: Search – BFS
    - Method 3: Search - …
  - Human interaction: Develop a basic chatbot (no AI) as outlined
  - Deliverable
    - Code structure in Github
      - ./data
      - ./code
      - ./docs
      - ./test
    - Presentation: Make sprint presentation on Oct 12, 2023

Reference: Project Rubric - NEW

- **Project report** – 60%
  - Project description: problem, related work, approach, evaluation – 40%
  - Working system demo/ video – 10%
    - Well organized Github with code (./data, ./code, ./docs, ./test) – 10%
- **Project presentation** – 40%
  - Evaluation by peers, instructor and TA
- **Bonus**
  - Instructor discretion – 10%
- **Penalty**
  - Lack of timeliness as per announced policy (right) - up to 30%

Milestones and **Penalties**

- Oct 12, 2023
  - Project checkpoint
  - In-class presentation
  - **Penalty: presentation not ready by Oct 10, 2023 [-10%]**

- Nov 30, 2023
  - Project report due
  - **Project report not ready by date [-10%]**

- Dec 5 / 7, 2023
  - In-class presentation
  - **Project presentations not ready by Dec 4, 2023 [-10%]**

Evaluation of Presentation

1. An online form will be available during presentation

2. During a presentation, three students will be assigned to review along with instructor and TA

3. They will enter following survey questions:
   1. Their name
   2. Presentation number
   3. How useful is the system – will you use it? [1-5 scale]
   4. How well have you understood the project from the presentation? [1-5 scale]

4. Top and bottom scores will be removed. Average of remaining three will be used for final presentation marks

Lecture 5: Summary

- We talked about
  - Graduate paper readings

Concluding Section

About Next Lecture – Lecture 27

Lecture 27: AI in the Real World

- Solving problems
  - What to focus on
  - Selecting methods and evaluation
  - Practical considerations

- Case studies

Date		
Nov 21 (Tu)	**Sequential Decision Making: Planning, RL**	**Quiz 4- end [Week 14]**
Nov 23 (Th)		Holiday - Thanksgiving
Nov 28 (Tu)	Paper presentation (grad students only)	
Nov 30 (Th)	AI for the Real World – Bringing All Together	Project – Sprint 3 - end
Dec 5 (Tu)	Project presentation	
Dec 7 (Th)	Project presentation	Last day of class
Dec 9 (Sat)		Reading Day
Dec 12 (Tu)	4pm – Final Overview	Optional, information shared