Kennesaw State University (KSU)
College of Computing and Software Engineering (CCSE)
CS-7075 Artificial Intelligence & Robotics

Team Project – Guidelines

NOTE:
Along with the guidelines outlined below, please consult a Project Sample Exercise that is posted separately to give an idea on limited scope of work that needs to be done as a part of the final comprehensive project that should be in perception, planning and control of a mobile robot.

Grading (overall 30%):

- Proposal Report – 5%
- Final Presentation (Peer Review) – 5%
- Final Presentation (Instructor Evaluation) – 10%
- Final Report (Instructor Evaluation) – 10%

Furthermore, a student **team** will **submit a project proposal report** by D2L Calendar deadline using a critical review of a "base paper" that would be the foundation of their project along with the proposed work that will involve hybridization, extrapolation, or original idea/s, for instance. The work should include the **perception, planning, control, and robotic system**, or a substantial coverage of only one of these areas. The **artificial intelligence** technique (from machine learning, machine vision, search, knowledge representation, or other related AI area/s) as a solution to robotics problem should also be a considerable part of the project being pursued. Focus will be on discovering, studying, or analyzing interesting and real-world problems with innovative, state-of-the-art solutions or contributions with performance comparison with other cutting-edge methods and techniques will be included in the project demonstrating their understanding.

A real-world problem can be found using the forums given next that you may be interested in; these forums include, but are not limited to, ICRA, IJRA, IROS, ICCMA, ICMRA, ICCAS, IRC, ICRAAI, CRC, ICHRI and will contain state-of-the-art problems especially if you will look out for survey and keynote papers. If you already have a specific paper, or work-related project in mind, you can suggest it too, and this will be a plus point.

The instructor will provide feedback soon thereafter, which will be used in starting and informing the work to be performed. Please consult and clarify any questions with the instructor. The Proposal will contain the **team** information (three members; size variation needs justification for approval), project **topic**, an **abstract** containing the problem introduction and statement, and solution methodology using the appropriate artificial intelligence technique (such as involving machine learning, machine vision, search, knowledge representation, etc.) as well as the expected results or their format. Solving interesting and real-world problems with performance comparison with other state-of-the-art methods will be included in the final report.

The followings must be included in the proposal:

1. Robotics problem definition and key points identification or highlighting. Must include perception, planning and control (or combination of behaviors giving rise to interesting emergent behavior) problem.
2. List of the AI method(s) that you will implement as solution. Must include the established AI methods but may or may not be used prior to address the robotics problem.
3. Modeling and simulation experimental design description.
4. Expected results.

The final project will be evaluated based on the following points:

1. Whether the motivation of the project is well described.
2. Whether computational challenges are well described.
3. Whether the robotics problem is well described.
4. Whether choice of AI techniques is well justified.
5. Whether an appropriate approach is applied to realistic and related robotics problem that may be being used in practice or literature.
6. How well the experimental settings are described.
    a. What AI methods did you consider for benchmark? How would you implement and test?
    b. What are evaluation strategies for the performance comparison?
    c. How many times are the experiments repeated?
7. How well the experimental results are discussed? How can the experimental results be interpreted?
8. Conclusion and Discussion
    a. What obstacles have you overcome?
    b. Any issues that you want to share with others?
    c. Any future plan in the related research?