

AI & Robotics Project Proposal

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Mar 9, 2021

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The project proposal

- ❖ A plan and a guide for your final project
- ❖ A kind of working document before the initiation of the project
- ❖ A document defines the objectives and requirements of a project
- ❖ The total pages of your proposal is around 2 pages (about 750 words), no more than 3 pages
- ❖ If the data sets and source code are used in your project, be cautious about the **copyright** and **privacy** policy. Do not include any sensitive and personal information in your datasets.
- ❖ The proposal should cover the following topics (or sections) (including the citations)

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Requirement of the project proposal

❖ First section — **Project overview or introduction**

1. Motivation of this project
2. Objective of this project
3. Scope of the project
4. Briefly introduce what the project is going to do, such as what the task, which algorithms will be focused on RL, components like agents, environment, etc.
5. How to implement it and what will be in your demonstration and presentation

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Requirement of the project proposal

❖ Second section — **Background and related work**

1. Background of techniques that you are going to use and implement
2. What are the existing solutions for the similar or same problems, and what are the limitations of these solutions.
3. Why your solution sounds or is a suitable one.

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Requirement of the project proposal

❖ Third section — Problem definition and technical approach

1. What is the problem statement (a kind of research problem statement)
2. Details of your technical approach, including particular algorithms, mechanism of exploitation and exploration, how to train the RL policy, etc.
3. Where do the training / testing data sets come from? and a brief description to your data. Be cautious about the **copy right** and **privacy** of the data.

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Requirement of the project proposal

❖ Forth section — Evaluation and expected results

1. Details of your evaluation approaches, performance measurement reports
2. Conclusions

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Requirement of the project proposal

❖ Fifth section — References

1. List all citations, use either MLA or APA style. There must be citations because no one can create everything from the scratch.

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Some Real-Life Applications of RL

- ❖ List some real-life examples, but definitely not ask you to do the same thing, just for some brainstorm for you to get some new ideas what you can plan to do (a tiny simulator that adapts all what you know about RL.)
 - ❖ Applications in self-driving cars
 - ❖ Applications in traffic controls
 - ❖ Industry automation — learning-based robots perform various tasks, for example, power consumption monitoring and maintaining in data centre
 - ❖ In trading and finance — reward based on the loss or profit of each trading
 - ❖ In healthcare — patients can receive treatment from policies learned from RL systems
 - ❖ News recommendation
 - ❖ In gaming — AlphaGo Zero
 - ❖ In marketing and advertising
 - ❖ In robotics manipulation

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Evaluation of the Project

- ❖ Project proposal is a kind of essay, **due before May 4**. It is worth 9 points over 25 points. That is the only part of the project that you should submit to me.
- ❖ The live demo (assume that comes from your implementation of your project) is worth 8 points. The team members maintain the implementation by themselves. (you can use Github). That is your work please don't send or share it to me. No expectation you can complete it in such short time. If you think it is a good idea, you may consider to continue working on it in other project based courses in future.
- ❖ The presentation part is worth 8 points.

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Evaluation of the Project

- ❖ The grade of the project proposal is given by me. Details about the grade guide see Project Proposal document.
- ❖ The grade of the live demo is given by team itself if the team has a live demo, and it achieves the objective of the proposal. The team will get 8 points. (If the team puts the project source in the Github, you can show it during the presentation.) If no live demo, the team will get 0 point for this part.
- ❖ The grade of the presentation part is given by me. I will ask questions about your project and other teams will ask questions as well. You will give answers.
- ❖ Grade guide for presentation:
 - ❖ no show up: 0 point for both presentation and live demo
 - ❖ show up, but a bad presentation and no answers to questions: 2 points for presentation
 - ❖ show up, tried the best to present but not good enough, can only answer part of questions: 4 points for presentation
 - ❖ show up, presentation is good, can answer most of questions correctly: 6 points for presentation
 - ❖ show up, presentation is very good, can answer all questions correctly: 8 points for presentation, 8 points for live demo

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Project Team

- ❖ We have 3 hours in total for all teams to present their work in the final exam day.
- ❖ Each team will present their work (presentation and demo) at May 4 or 11 the final exam day.
- ❖ Each team is given 30 minutes to present their work (including presentation and QA).
- ❖ We will have maximum 5 teams in total.
- ❖ Thus, the minimum size of the team is 2 students, and the ideal maximum size is 4.
- ❖ The team members for each team must be finalized no late than April 6.

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