Scoring Criteria 2024

Research Proposal and PPT

Content Requirements

The proposal must be written in LaTeX. You can refer to SUSTech Master Thesis GitHub Repository.

1. **Background and Significance**
    1. Answer: Why is this problem worth studying? What is its significance?
2. **Analysis of Current Research Status**
    1. Analyze recent research progress in this field. Ensure logical clarity and reasonable classification of literature.
    2. Include at least 15 relevant references.
    3. Summarize the research challenges in the selected direction.
3. **Completed Work**
    1. Fundamental knowledge acquisition, including learning about models, internal principles, and platforms (the results of learning should be presented, which may include formulas and simple model inference outcomes).
    2. Deployment results of models.
4. **Research Plan and Expected Results**
    1. Outline a research plan, from topic selection to project completion, in weekly increments.
    2. Describe the expected outcomes.
5. **Potential Challenges and Solutions**
    1. Elaborate on potential difficulties in the research process. Do not provide vague descriptions.
    2. Propose detailed solutions to possible problems.
6. **References**

Evaluation Dimensions

Dimension	Weight	Scoring Criteria	Score
Background and Significance	30%	Clarity and detail in answering research motivations and significance	
Analysis of Current Research Status	30%	Thorough analysis and summary of existing literature. Clear classifications and comparisons using tables or diagrams will score higher.	
Completed Work	15%	Evaluation of whether the completed work supports subsequent research.	
Research Plan and Expected Results	10%	Reasonableness of the research plan and expected results.	

Dimension	Weight	Scoring Criteria	Score
Potential Challenges and Solutions	15%	Thoughtfulness in identifying potential challenges and proposing solutions.	
Total	100%		

Final Presentation and Report

The Final Report should be based on the Research Proposal.

Content Requirements

1. **Background and Significance** (same as in research proposal)
2. **Analysis of Current Research Status** (same as in research proposal)
3. **Contributions of This Study**
    1. What has been achieved? What are the contributions of this project?
    2. Project completion status: Were the predefined goals achieved?
4. **Research Effect Demonstration**
    1. Showcase research results and their correspondence with tasks (e.g., what improvements were made and what results were achieved as a consequence).
    2. Apart from textual and graphical descriptions, using videos to introduce research outcomes will earn additional points.
5. **Future Work**
    1. Identify potential research directions based on this work.
6. **Teamwork and Individual Contributions** (to be filled in by the team leader).
7. **References**

Evaluation Dimensions

Dimension	Weight	Scoring Criteria	Score
Project Completion	30%	Project completion status (see standards below).	
Innovation and Contribution	20%	Evaluation of the project's contributions (see standards below).	
Presentation Quality	30%	Clarity in explaining problems, methods, and results. Using multimedia (videos, diagrams) will earn extra points.	
Teamwork and Collaboration	10%	Reasonableness of task allocation within the team. Equal workload distribution scores higher.	
Individual Performance	10%	Individual contributions during research and final presentation.	
Total	100%		

Project Completion Evaluation Standards

The evaluation criteria for **Project Progress** and **Innovation and Extra Contribution** are as follows. Meeting all requirements listed in the table will result in full marks. Other scoring dimensions follow the same standards.

Project	Project Progress	Innovation and Extra Contribution
Object Detection and Tracking	Complete 2D or 3D object detection and tracking. The algorithm must run in real time on the given dataset (video or point cloud).	Achieving state-of-the-art (SOTA) performance in detection and tracking earns full marks.
GAN for Self-Driving Data Augmentation	Complete three predefined steps, use GAN to generate data, and achieve data augmentation.	Achieving SOTA-level data augmentation earns full marks.
CARLA Simulator	Implement one of three topics in CARLA: object detection, tracking, or motion planning (direct use of CARLA's built-in algorithms is not allowed).	Achieve detection and tracking results comparable to real-world datasets. For motion planning, ensure safe navigation in multi-lane environments with multiple vehicles.
Traffic-Sign Detection and Recognition	Complete traffic sign detection and recognition. The algorithm must run in real time on the given dataset (video or point cloud).	Achieving SOTA-level detection and recognition earns full marks.
Lane Detection	Complete the lane detection task. The algorithm must run in real time on the given dataset (video or point cloud).	Achieving SOTA-level detection earns full marks.
Vehicle-Road Cooperation	Complete three tasks to enhance perception range and accuracy for vehicles.	Achieving SOTA-level perception earns full marks.
RL-Based Motion Planning for Robots	Deploy a reinforcement learning-based motion planning algorithm in CARLA or Gazebo and compare it with at least one traditional method.	Achieve a navigation and obstacle avoidance success rate of over 50%.
Semantic Segmentation	Complete the task and implement semantic segmentation functionality.	Achieving SOTA-level performance earns full marks.
Scenario Generation via Diffusion Model	Understand diffusion models, implement scene generation using a diffusion model, and deploy the generated scenes in CARLA.	Utilize the model's advantages to generate diverse scenes.

Project	Project Progress	Innovation and Extra Contribution
3D Object Detection with Active Learning for Autonomous Driving	Complete four steps in the project, use active learning to reduce annotation workload while maintaining model performance.	Achieve results close to the original model performance.
Bayesian Neural Network for Detection	Use a Bayesian Neural Network (BNN) for object detection and measure uncertainty.	Achieving SOTA-level performance earns full marks.