上海海事大学

Software project plan

Project Name：Fabric Defect Detection System

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Time：2023.3.28

Software project plan

1. Project Outline

1.1 Background

Artificial intelligence is a strategic emerging industry in China. With the continuous improvement and upgrading of various industries, industrial informatization has gradually been put on the agenda. AI plays an important role in informatization, which can replace human to complete some complex and time-consuming tasks in the past.

Fabric defect detection is an important part of production and quality management in the textile industry, and intelligent detection of fabric defects has been a technical bottleneck that has puzzled the industry for many years. Currently, almost all of the detection are manual tasks, which are susceptible to subjective factors and lack consistency; And long-term work under strong light has a huge impact on testers' vision. Using advanced technologies such as AI and CV to achieve intelligent detection of fabric defects is undoubtedly of great value.

1.2 Project overview

This project aims to complete an online fabric defect detection system. It is mainly composed of an online detection module and a deep learning module. The online detection module provides an interface on which users can upload images for detection or generate images for performance testing. The deep learning module is mainly composed of corresponding models to provide defect detection function.

The system is developed by B/S architecture, and the entire system will be released together after completion, rather than individually for each module.

1.3 Technical advantage analysis of the project

Currently, both industry and academia have do a lot of research on generation models and target detection models, and have achieved excellent performance. Many fabric defect detection systems currently on the market also use the most advanced models. However, these advanced models are often difficult to reproduce and have a large number of parameters, which also require a lot of money to establish. Therefore, our system has chosen the most popular and stable model to provide a relatively reliable system with minimal investment.

1.4 Deliverable results

The final contents of this system mainly include: system's source code, model's source code, trained model files, project plans, technical documents, user manuals, etc.

1.5 Project development environment

The development environment of this project is four PC.

1.6 Project acceptance method

All content of the system will be submitted to GitHub for teachers to check and the system will be introduced through a presentation in the last week.

2. Project Team Organization

2.1 organization structure

The project called “fabric-defect-detection system” is developed by our team. In terms of the organization structure of the team, a rotation system will be adopted instead of a fixed project manager: there are four members in the team, in different periods of development, members with relatively less workload will become project managers to organize and supervise the progress of the project, so as to ensure the project can be completed smoothly.

2.2 Division of Labor

There are four members in the team. As mentioned above, the core function of the project is defect detection, which will mainly have four functional modules: detection model corresponding to target detection, generation model corresponding to generation adversarial net, basic front-end display page, and basic back-end data uploading and downloading function. The target prediction model will be led by one person and assisted by others, while the generation model will be led by one person and assisted by others. The front-end page display will be led by one person, and the back-end data upload and download will be led by one person. As mentioned above, a single functional module will be led by one person and assisted by others, and the team members will participate in the whole project development. Everyone need work in the whole project cycle.

2.3 Implementation and communication

In terms of project implementation and communication, the team will hold a weekly meeting to arrange tasks and summarize the current project results. If necessary, a temporary online meeting will be held to communicate and implement the project.

3. Project development plan

3.1 Progress description

Work	Sub-work	Finish Time	Submit Content (most important content)	Description
Preparing	Making team	Week 3	Team list	
	Selecting project	Week 4	Brief description of the project	Fabric defect detection
	Write plan	Week 5 Week 6	Project Plan	Because of the lesson,we will submit it at Week 7.
Learning	Learning deep learning	Week 7	A report about what you have learned in this week	
Model building	Learning the generative model and detection model	Week 8	Submit a demo	Using open access datasets.
	Building the model	Week 9	Submit the model	The model may not be prefect or complete. However,it must be used to solve the real problem

Work	Sub-work	Finish Time	Submit Content (most important content)	Description
	Improving the model	Week 10	Submit the model	You need to submit a relatively complete model
Learning	Learning system development. Improving the model.	Week 11	A report about what you have learned in this week.	
Development	Developing the system. Improving the model.	Week 12	Source Code of the system.	
	Developing the system. Improving the model.	Week 13	Source Code of the system.	
Testing	Testing the project	Week 14	Test Documentation	
Finishing	Finishing the project	Week 15	The complete system	

3.2 Milestone setting

First iteration

Week 3

Main work:Making team

Milestone: Team leader submits team list.

Week 4

Main work: Selecting project.

Milestone: Team leader submits the project and a brief description on the online document.

Week 5,6

Main work: Writing the project plan.

Milestone: Team leader submits the project plan at week 7.

Week 7

Main work: Learning deep learning.

Milestone: Everyone should submit a report about what you have learned in this week.

Week 8

Main work:Learning the generative model and detection model.

Milestone: Team members should submit their own work in this week.The member who is responsible for the model should submit a demo.

Week 9

Main work: Building the model

Secondary work: Learning the knowledge

Milestone: Team members should submit their own work in this week.The member who is responsible for the model should submit the model.This model can be incomplete,but it must be used to solve the problem we propose.

Week 10

Main work: Improving the model

Secondary work: Learning the knowledge

Milestone: Team members should submit their own work in this week.The member who is responsible for the model should submit the relatively complete model.

Second iteration

Week 11

Main work: Learning how to develop a system.

Secondary work: Improving the model.

Milestone: Everyone should submit a report about what you have learned in this week.If start programming, member should submit the source code.If someone improves the model ,he should submit it on the GitHub.

Week 12,13

Main work: Developing the system.

Secondary work: Improving the model.

Milestone: Team members should submit their own work in this week.The member who is responsible for the system should submit the source code.If someone improves the model ,he should submit it on the GitHub.

Week 14

Main work: Testing the system.

Secondary work: Improving the model.

Milestone: Team members should submit their own work in this week.The member who is responsible for the testing should submit the test document.If someone improves the model ,he should submit it on the GitHub.

Week 15

Main work: Finishing the system.

Milestone: Team members should submit their own work in this week.The team should merge the branches and submit the final system.

4. Project Risk

Risk Type	Risk	Solution
schedule risk	Unable to complete due to time constraints	Member should fully consider various potential factors and make plans. Breakdown of tasks should be in detail. Members should strictly follow the project plan.
Technical risks	Unable to build a robust model due to the hardware performance	The performance of the model can be allowed to be weak, but it must be able to complete corresponding tasks.
Human Resources Risk	Members cannot complete this week's task due to special reasons.	Members need to notify other members in advance, and other members are responsible for completing the module.