Tech Review

Draft

Group 11: Real-time Seed Identification

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Abstract

This Tech Review draft contains 3 pieces of Tech Review of group 11: Real-time Seed Identification. For this draft, tech review focus on Testing. Data Testing is basic on training. After collection of data, machine should be trained as image training. The Data Testing part is right behind it. What is Data Testing do? Data Testing should tell us if the machine is working well, or not. There is few ways and few steps for Data Testing.

1 Algorithms and Functions

1.1 Overview

Data Testing should run one or more algorithms. Algorithms and functions in this part should contain functionalities that provide us information. Information includes but not limit: Accuracy rate, parameters, prediction value, error message. It is a part of software. Generally speaking, Data Testing can be thought as part of machine. What Data Testing do is what the machine should do.

1.2 Criteria

Data Testing requires very large of data. Using data to test our machine. Algorithms here might be same with data collection. The Data Testing in this part does not concern large amount of seeds data. Algorithm here focus on expression and description. Data which has been test here could also come to learning part, to be other data source. Functions here should focus on division.

1.3 Potential Choices

1.3.1 Functions: bwboundaries and bound2im

Those two are two bound function which using in digital image processing. Using bwboundaries can read and only read edges for each field. Using numel() after bwboundaries can load a binary image from digital image. Function bound2im provide nums of hole and edge, also work with digital image processing.

1.3.2 Function: imfill and MATLAB Toolbox functions.

Function imfill has different processing step and mode to binary image input and gray scale image input. From target point by location, imfill processes binary image input and do it with pixel filling. It allows matrix input. Also, MATLAB Toolbox functions provide more functionalities than normal functions.

1.4 Conclusion

The functions part is focus on software, design the algorithm for testing. This is important because this part can provide us more information about our machine. Is that an error? Why my function is wrong? Why the rate is so low? After the machine is made, we should focus on how to make it better.

2 Camera

2.1 Overview

Same like Data collection, we need camera. After data collection, all of our data is digital image data. What we need is real image data. Data should come from camera. In this part, we focus on hardware. A good camera could provide us good picture. Which means the data is clean.

2.2 Criteria

The Camera should provide clean data of image. But don't need too powerful because we will have normalization, which means normalize all data in same type, size. We must make sure there is no other things on the camera.

2.3 Potential choices

We don't have potential choices now. Due to next meeting with ME group is on Thursday, we must discuss about camera with them.

2.4 Conclusion

Camera is important, a good camera means good picture. The camera must be clean. In this case, we can have good pictures.

3 Data collecting model

3.1 Overview

Data collection in this project is very important. The more data we have, better rate we have. Data collecting model here is not a software model, it is a hardware model. We should have more than thousands picture (even worse, million.) It is almost impossible to get these pictures by hand.

3.2 Criteria

Hardware model could take picture by itself. Don't need normalization or other kind of works. Only need to take picture. At least 1000 picture in 1-2 hours.

3.3 Potential choices

Hardware machine with a script by ourselves. There is a machine which was built by ME group, it can move seeds slowly. Using camera and a script, we can design a machine that take picture.

3.4 Conclusion

For this project, in testing, picture is very important. A big amount of data is also necessary.