

CHAPTER 6 CONCLUSION AND FUTURE WORK

6.1 Conclusion

In this thesis, we have proposed the method which consists of three main phase: extracting tooth regions from a dental image, segmenting teeth in tooth regions, and detecting a missing tooth and amalgam.

In tooth extraction, the teeth color is estimated from soft tissue color surrounding the tooth regions. We have used the way of dynamic threshold in section 2.1 to decide a region which is belonging to tooth region or soft tissue region. We decide a threshold value according to each dental image close to teeth color or soft tissue color. We can remove soft tissue regions and retain tooth regions effectively.

In tooth segmentation, we have different methods in two types of dental images. In line-aligned images, we have used the method of dynamic windows to segment teeth and can achieve correct rate above 85%. In parabola-aligned images, only using one parabola to segment teeth cannot segment teeth correctly. We have used the way of two parabolas instead of only using one parabola to segment teeth more correctly. Our correct rate of tooth segmentation in parabola-aligned images can achieve above 90%.

In tooth detection, we use the average size of tooth from training to decide if a missing tooth exists. And we apply Bayesian Decision Rule by the color information of amalgam to classify amalgam or non-amalgam.

6.2 Future work

The status of each tooth consists of decayed tooth, metal crown, composite resin, and porcelain material. Our status of each tooth should be defined in more classes. We have five kinds of experimental images. The combination of features extracted from different images in a specific set can provide more tooth information. For example, if we can not find a missing tooth in the front view, we can find in the upper view on the maxilla. In our labeling method, we label teeth using position information. In the future, more features can be used to label the tooth more correctly. For example, we can add some information to recognize teeth according to the shape of teeth and size of teeth.

