Segmentation Review Protocol

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Introduction

- You will be reviewing fish images and rating the segmentation as successful (thumbs up) or unsuccessful (thumbs down) using the following site: https://scale-score.neocities.org/
- Unsuccessful segmentations come in the following forms:
  - Failure to remove a significant* portion of extraneous information or background
  - Removal of a significant* portion of the actual fish of focus
  - Significantly* rough or unclean edges around the segmented fish image
- The following slides are examples of successful and unsuccessful segmentations
- If you have any questions, please email me at changs04@g.ucla.edu

*Significance is determined at the discretion of the reviewer as to whether the loss of data or extraneous pixels would affect the identification of fish visual patterns by a machine classifier. If unsure, it is best to opt for an unsuccessful rating. For a quantitative estimate, if 10% or more of the image is extra or lost pixels, it is likely an unsuccessful segmentation.

Successful Segmentation

- Clean edges around the fish
- No background information
- The whole fish is preserved

Successful Segmentation

- No background information
- Although the image is low quality, the shape of the fish is preserved with no loss of major fish parts
- Images can have rough edges and low quality! As long as the rough edges do not lead to a significant cumulative loss of pixels!

Successful Segmentation

- Generally, the angle of the fish is not a problem
- The fish has clean edges, with no background information

Successful Segmentation

- Although, there is some loss of pixels in the fish's tail, the majority of the tail is still visible
- The rest of the fish is well-segmented

Successful Segmentation

- Some background information got through the segmenter, but in total it does not account for 10% or more of the segmented image
- There wasn’t significant loss of fish data
- Sometimes, it can be difficult to tell if the amount of background is significant or not
- If you are unsure, please rate the image as unsuccessfully segmented

Successful Segmentation

- This fish is an interesting case
- There is some slight background that got through the segmenter near the bottom, but that is a minimal gain in pixels and insignificant
- The back of the fish is quite blurry and low quality, but we are not assessing quality but rather the visibility of patterns
- Some rough edges on the lower half of the fish, but they do not introduce excess background information or cause a large loss of data that affects pattern identification
- Therefore, this is a successful segmentation

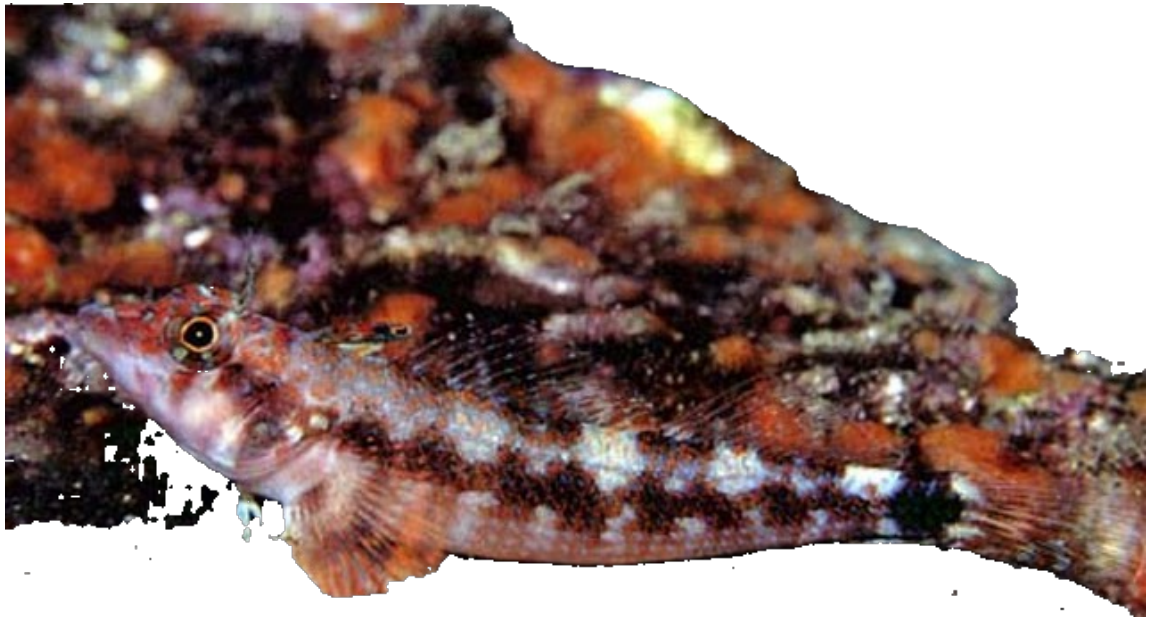
Unsuccessful Segmentation

- There is clearly a huge loss of information in this image, specifically the lower majority of the fish

Unsuccessful Segmentation

- At first look, this fish looks fairly well-segmented: clean edges, patterns are clear…
- However, the fish appears to have lost its tail, and the machine classifier would not be able to properly assess the presence of a potential tail pattern
- Small losses that consist of a whole fish part result in unsuccessful segmentation

Unsuccessful Segmentation



- A large portion of the segmented image consists of extraneous background pixels
- The background would likely affect a machine classifier’s ability to identify fish patterns

Unsuccessful Segmentation

- The segmenter cut out the fish image, not the background
- There is a clear loss of fish data and a presence of significant background

Unsuccessful Segmentation

- The loss of both the tail and a whole fin render this an unsuccessful segmentation

Conclusion

- In summary, unsuccessfully segmented images are defined as follows:
  - Failure to remove a significant portion of extraneous information or background
  - Removal of a significant portion of the actual fish of focus
  - Significantly rough or unclean edges around the segmented fish image
- In cases where it is difficult to give a rating, please rate the image as an unsuccessful segmentation
- Lastly, thank you for your help!