Animation character identification

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- (Semi) supervised classification of animation character images.
- Dealing with variations in character posture, occlusion, drawing style, exaggerations.

Figure : Images illustrating variations for a single character.

- Preprocessing: removing outlines, switching color space.
- Segmentation to isolate parts of interest - hair, clothes, face...
- Classification by comparing segmentation against training set.

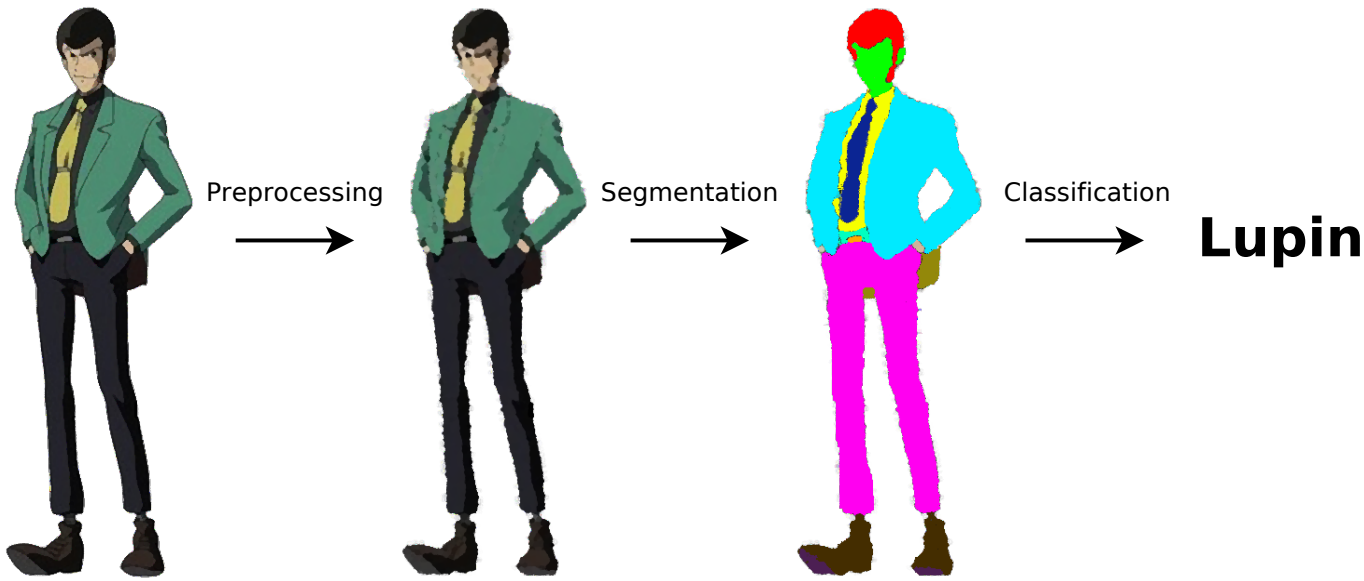


Figure : Diagram depicting how preprocessing, segmentation and classification interact.

- Consider 4 square windows around the pixel to filter.
- Compute mean color and variance in lightness (L in HSL) for each window.
- Assign mean corresponding to smallest variance.

(a) Before filtering.

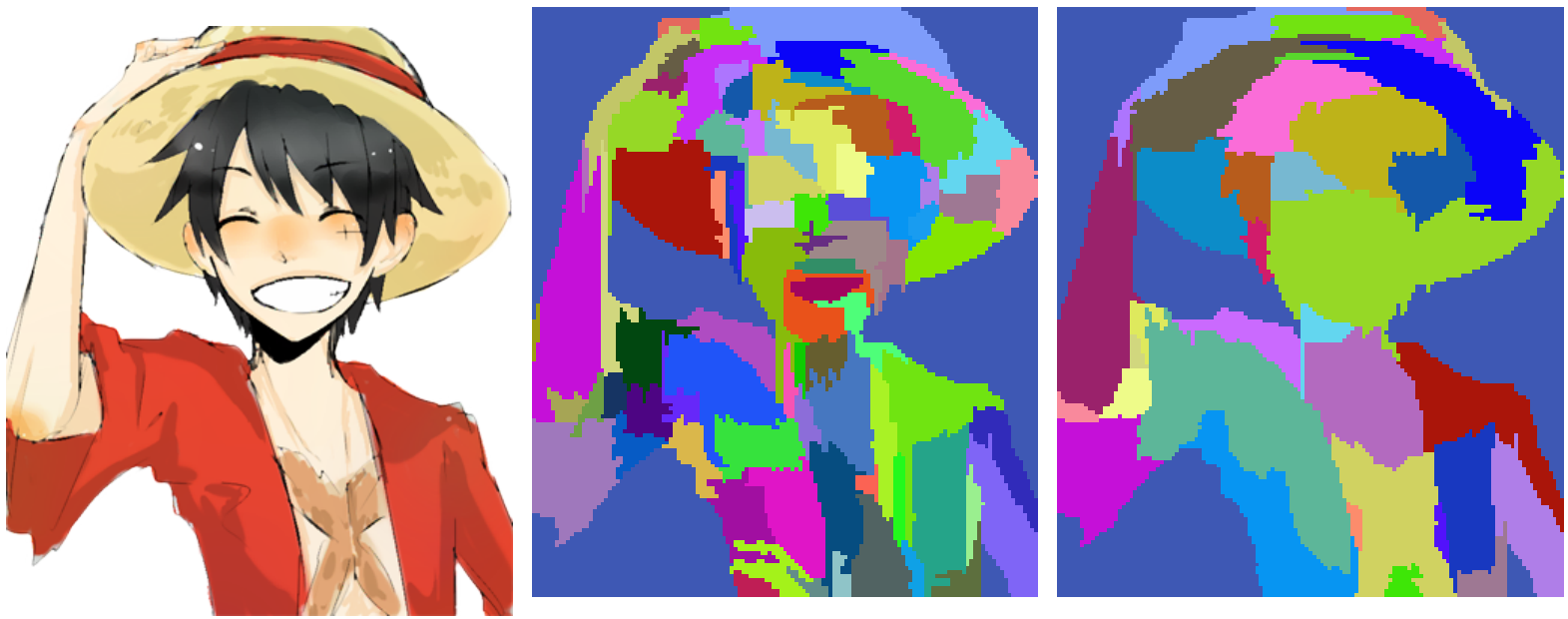
(b) Small window.

(c) "good" window.

(d) Large window.

Figure : Results of Kuwahara filtering with varying window size.

- Graph method based on Kruskal's algorithm.
- Efficient: $O(n \log(n))$ time with 4-connected neighborhood.
- Accurate: neither too "coarse" nor too "fine".
- But depends on a scale parameter k which controls the size of segments.



(a) Original image (b) $k = 100$. (c) $k = 1000$.

- Post processing by merging segments with close hue.
- Allows varying segment sizes and non connected segments.

(a) Original image.

(b) Before merging.

(c) After merging.