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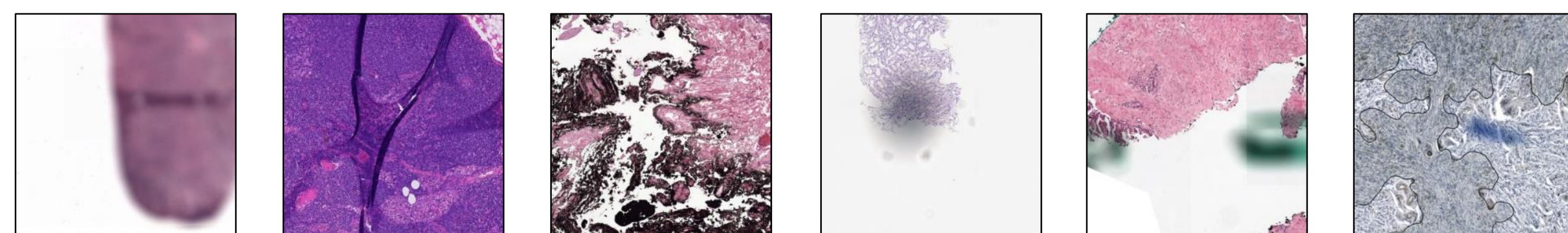
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## Motivation

- Whole-slide imaging technology
- Automated analysis of digitized glass slides
- Artifacts interfere with accurate diagnosis

## Materials

- Diverse set of 142 whole-slide images
- Included 9 tissues, 8 stains, 7 scanners
- Annotated 3,000+ artifacts
- Patches of 320×320 pixels



## Methods

### Artifact segmentation module

- DeepLabV3+<sup>1</sup> with EfficientNet<sup>2</sup> encoder
- Two-stage inference : (1) tissue segmentation and (2) artifact segmentation

### Quality control module

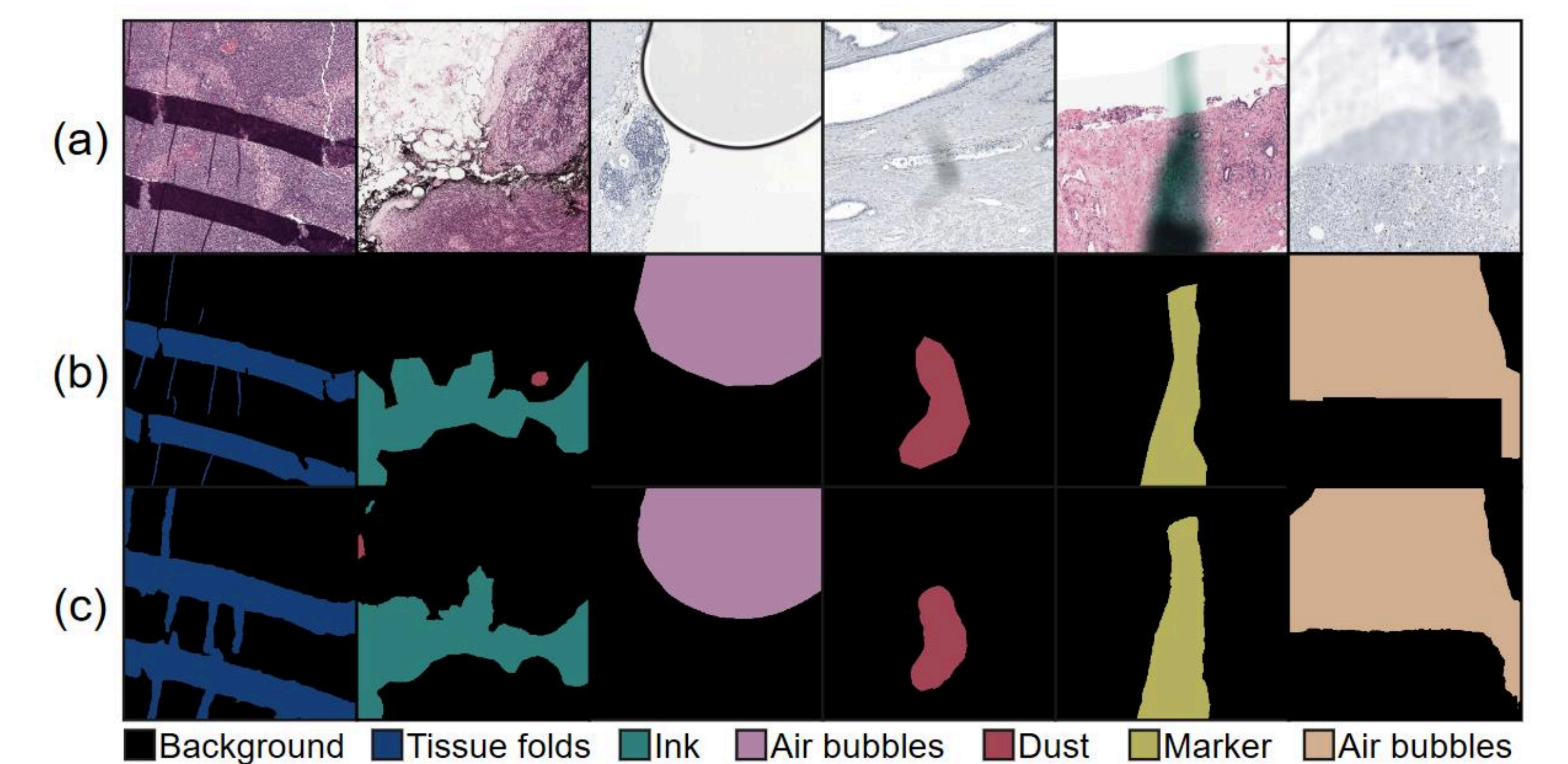
- Decision tree classifier using feature of segmentation output
- Output one of the four actions: "clean up", "re-scan", "re-cut", and "no action"

[1] Chen et al. (2018), *Proceedings of the European conference on computer vision (ECCV)*

[2] Tan and Le (2019), *International Conference on Machine Learning*

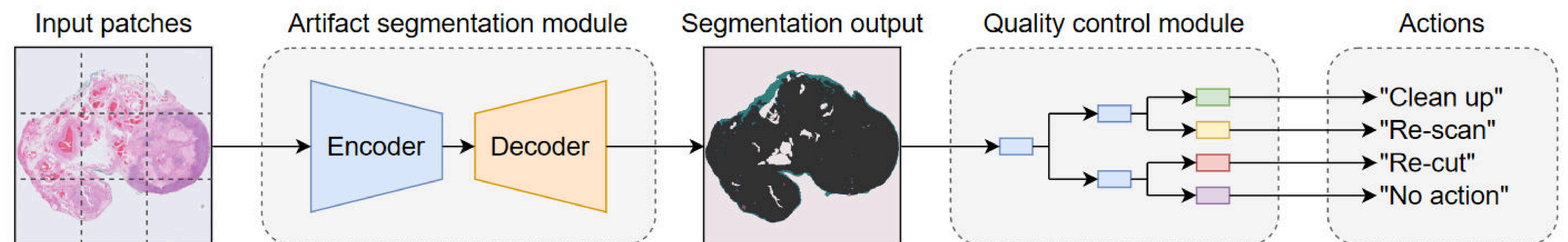
## Results

True \ Predicted	Back-ground	Tissue folds	Ink	Air bubbles	Dust	Marker	Out-of-focus
Background	0.93	0.01	0.03	0.00	0.01	0.01	0.01
Tissuefolds	0.13	0.87	0.00	0.00	0.00	0.00	0.00
Ink	0.09	0.01	0.89	0.00	0.00	0.00	0.00
Airbubbles	0.05	0.00	0.00	0.93	0.00	0.00	0.02
Dust	0.22	0.00	0.04	0.00	0.70	0.04	0.00
Marker	0.03	0.00	0.00	0.00	0.00	0.97	0.00
Out-of-focus	0.03	0.00	0.00	0.00	0.00	0.00	0.97



## Framework

- Artifact segmentation module
- Quality control module



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