MU-US (2)

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Platform: Linux

Prerequisites: Python 3.7.6 with PyTorch 1.7 and OpenCV-Python 4.2

MU-US (2): SUMMARY

Our cell tracking pipeline combines **MU-Ra-US** with our adaptive multi-object tracking algorithms [1, 2].

MU-US (2): PREPROCESSING

The same pipeline as in **MU-Ra-US** is followed.

MU-US (2): SEGMENTATION

The same pipeline as in **MU-Ra-US** is followed.

MU-US (2): POST-PROCESSING

The same pipeline as in **MU-Ra-US** is followed, removing connected components in the cell masks of size smaller than *T*.

MU-US (2): TRACKING

Our pipeline is based on our adapted mutli-object tracking algorithms [1, 2]. Multi-cell tracking tracks the detected cell outputs from the segmentation module. The tracking module involves a multi-step cascade data association composed of two steps: frame-to-frame association driven by intersection-over-union mask scores [3] and global association driven by spatial and temporal clues of individual objects to relink fragmented tracklets. Several modules have been used to improve the performance: gating strategy for reducing assignment complexity by pruning improbable assignments; and Kalman filtering for recovering from miss-detections, removing unreliable tracklets, and explicitly handling cell entering or leaving the field of view.

REFERENCES

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3. Crouse DF. On implementing 2D rectangular assignment algorithms. *IEEE Transactions on Aerospace and Electronic Systems* **52**, 1679-1696 (2016).