

A Viterbi approach to topology inference for large scale endomicroscopy video mosaicing (supplementary material)

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Supplementary Data: Comparison to baseline algorithm with topology inference mode

Although the baseline algorithm with topology inference mode may produce very accurate results in many scenarios, it is not sufficiently robust in our particular framework. We relied upon statistical proof to demonstrate it and consequently to justify the choice of the translation mode as our reference baseline algorithm. We used the same validation method as previously. Let X_i^M , be the positions of frame F_i in the final mosaic image obtained using one of the algorithms denoted by M for the sake of genericity. We computed for each frame $\Delta_i^M = (X_{i+1}^M - X_i^M) - (X_{i+1}^O - X_i^O)$ where O refers to the *oracle*, which was generated by manually inferring the topology through visual assessment. We considered the in vivo acquisition on pig liver, and performed a sign test computation between the populations Δ_i^M .

The results are shown in Table 1 and Fig. 1.

Table 1. Statistical analysis of the baseline algorithms and the proposed method on pig liver

Comparison	Result	p-value
Proposed vs. Baseline	$\Delta_i^V < \Delta_i^B$	2.1568e-08
Proposed vs. Baseline with topology inference	$\Delta_i^V < \Delta_i^{B_{TI}}$	8.9136e-31

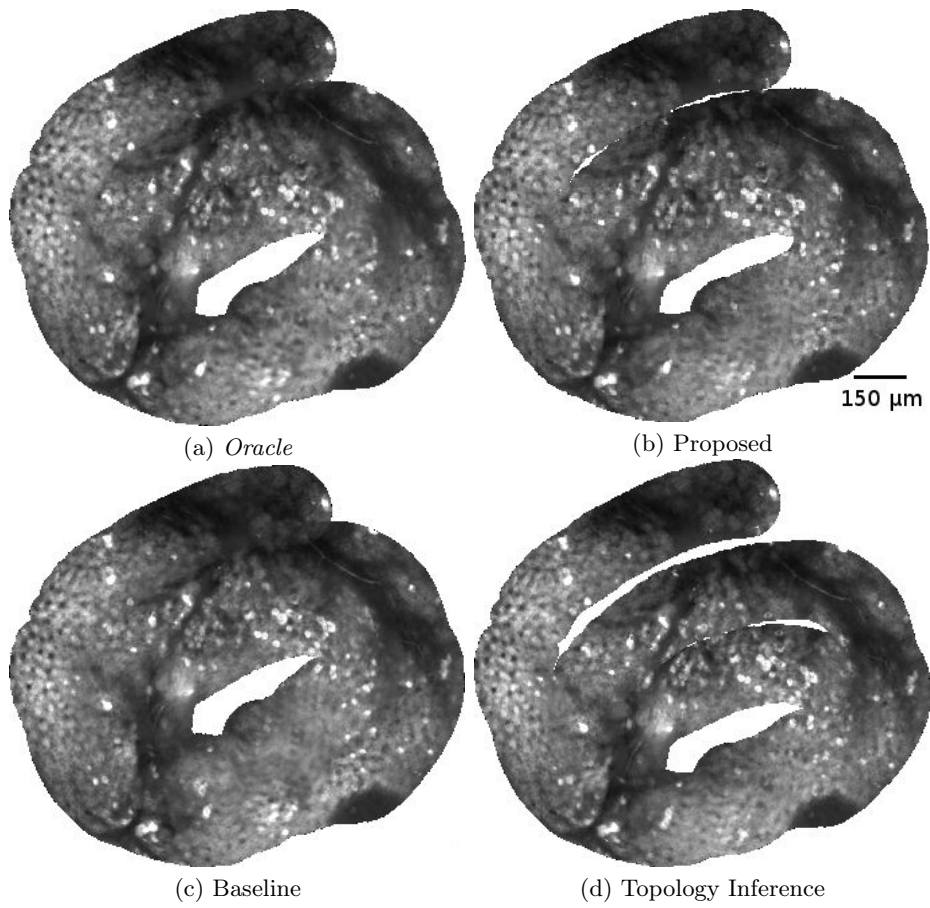


Fig. 1. Final result of mosaic reconstruction with the *oracle* reconstruction (a), our proposed method (b), the baseline algorithm using translation mode (c) and topology inference mode (d).