

# Learning-Based Affine Registration of Histological Images

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## • Highlights

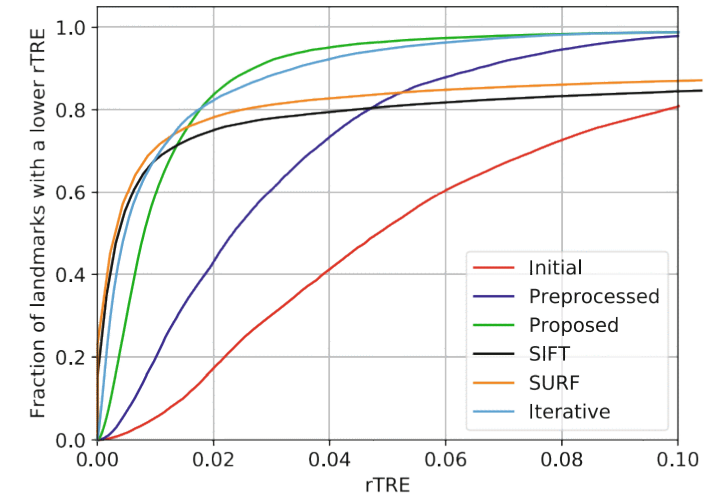
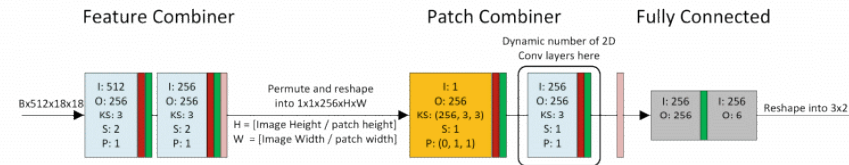
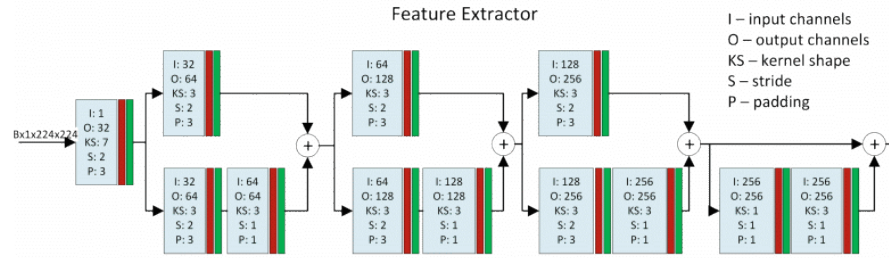
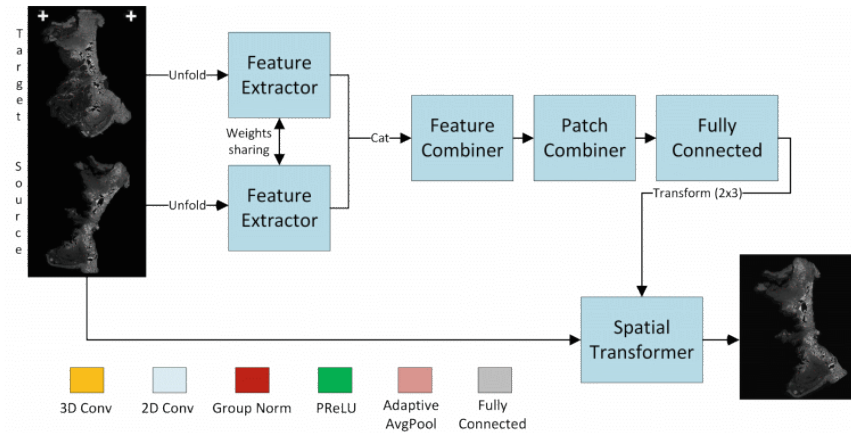
- The paper proposes a method for a learning-based affine registration that works for different resolutions and aspect ratios with a single model

## • Findings

- The method is faster and more resistant to failures than the state-of-the-art, classical methods

## • Interesting observations

- The success rate is higher, even though the TRE is worse



**Fig. 2.** The cumulative histogram of the target registration error for the proposed and compared methods. Please note that all the compared methods use the same preprocessing pipeline to make them comparable. We experimentally verified that the preprocessing does not deteriorate the results for the feature-based approach and significantly improves the results for the iterative registration.

**Table 1.** Quantitative results of the rTRE calculated using the ANHIR submission website [3] as well as the average processing time for the affine registration step. The success rate for the initial state shows the ratio of pairs not requiring the initial alignment.

	rTRE			Time [ms]	Success rate
	Median	Average	Max (Avg)	Average	[%]
Initial	0.056	0.105	0.183	–	31.15
Preprocessed	0.023	0.035	0.069	–	67.36
<b>Proposed</b>	0.010	0.025	0.060	4.51	98.34
SIFT [26]	0.005	0.085	0.174	422.65	79.21
SURF [25]	0.005	0.100	0.201	169.59	78.38
Iterative [27]	0.004	0.019	0.050	3241.15	97.30