SIFT TEXTURE DESCRIPTION FOR UNDERSTANDING BREAST ULTRASOUND IMAGES

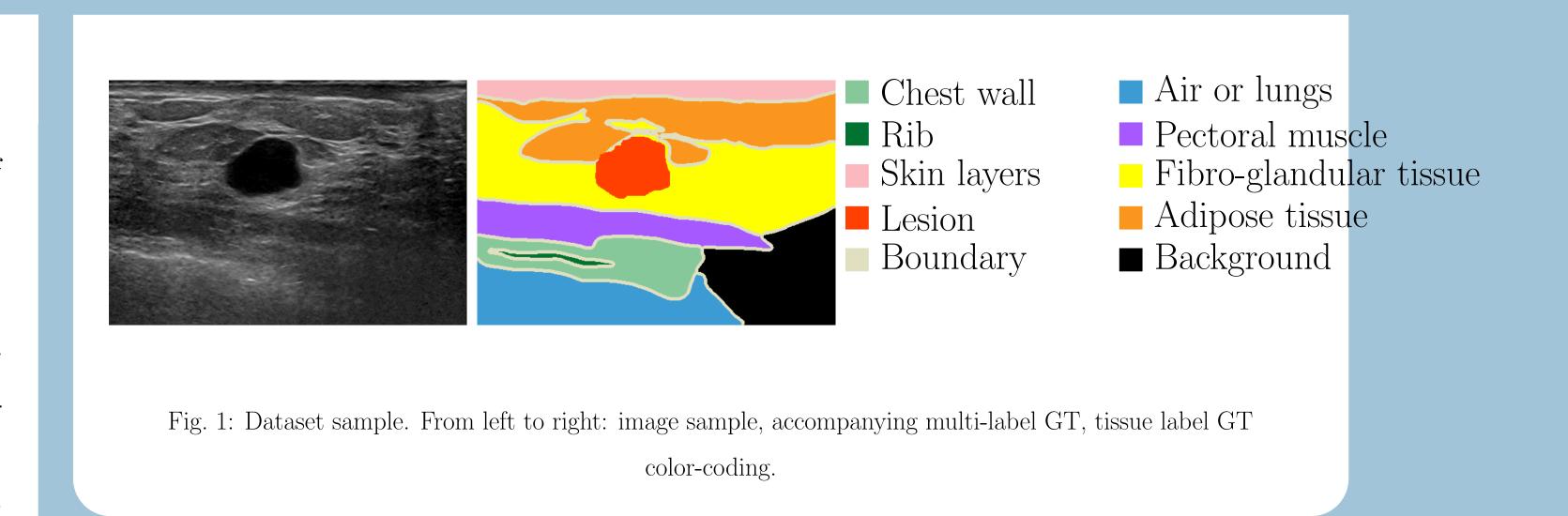
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Abstract

Texture is a powerful cue for describing structures that show a high degree of similarity in their image intensity patterns. This paper describes the use of Self-Invariant Feature Transform (SIFT), both as low-level and high-level descriptors, applied to differentiate the tissues present in breast US images.

For such a task, a subset of 16 images has been randomly selected from a larger dataset of 700 Ultra-Sound (US) images acquired at the *UDIAT Diagnostic Centre of Parc Taulí* in Sabadell (Catalunya), between 2010 and 2012. This subset has been complemented with multi-label Ground Truth (GT), as illustrated in figure 1.

Experimental results are provided showing the validity of the proposed approach for describing the tissues in breast US images.



SIFT as a low-level descriptor

For the low-level texture descriptors case, SIFT descriptors are extracted from a regular grid. The high-level texture descriptor is build as a Bag-of-Features (BoF) of SIFT descriptors.

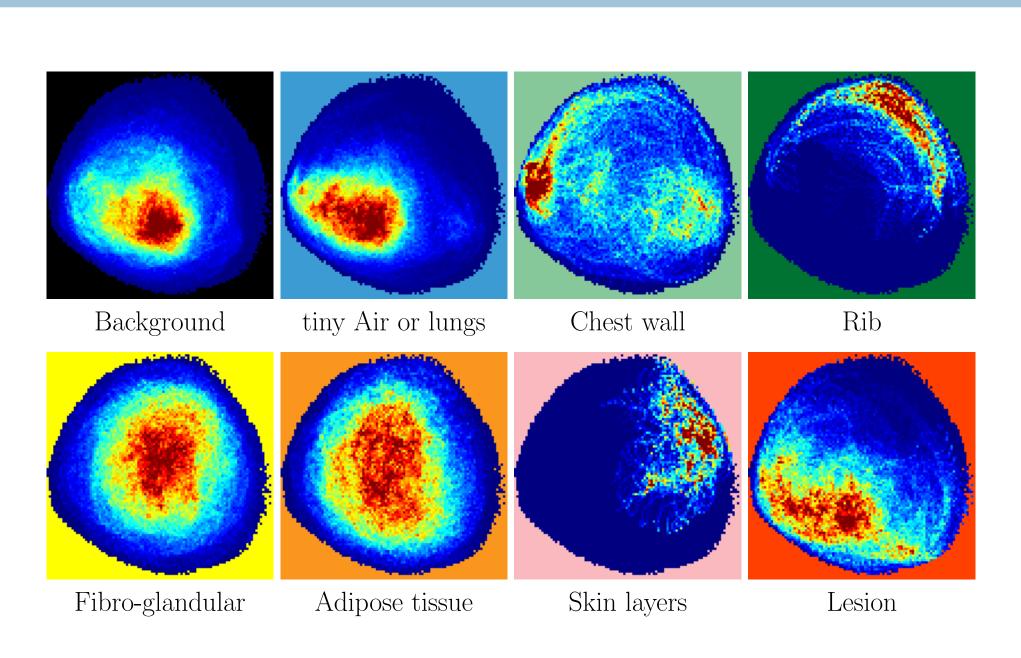
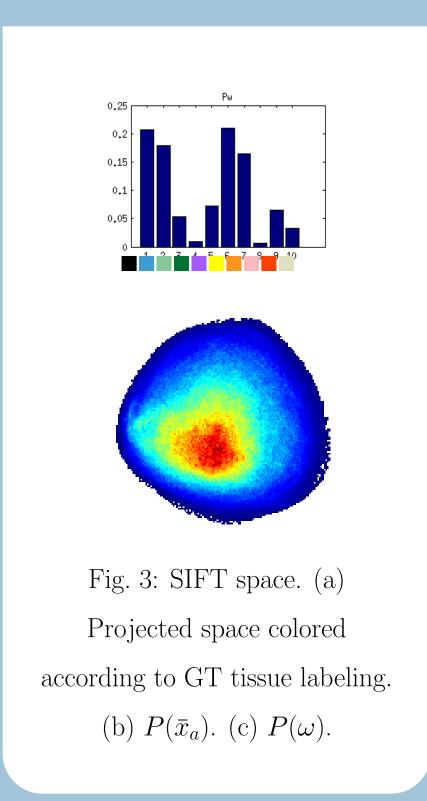
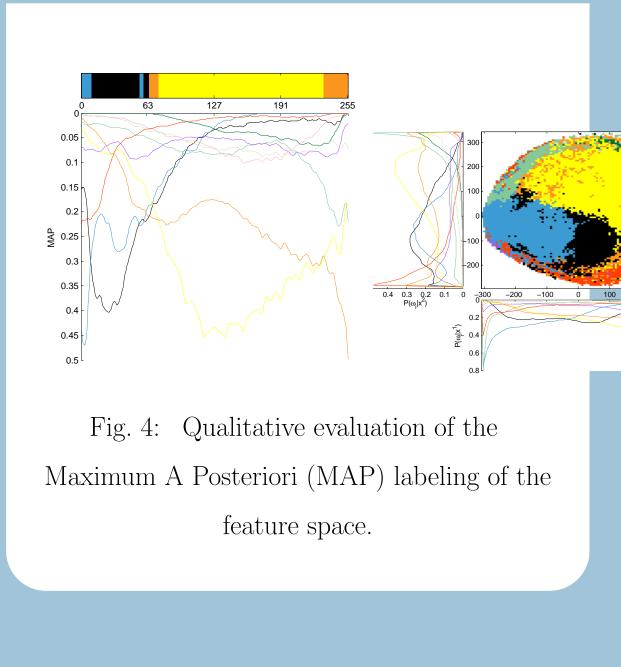
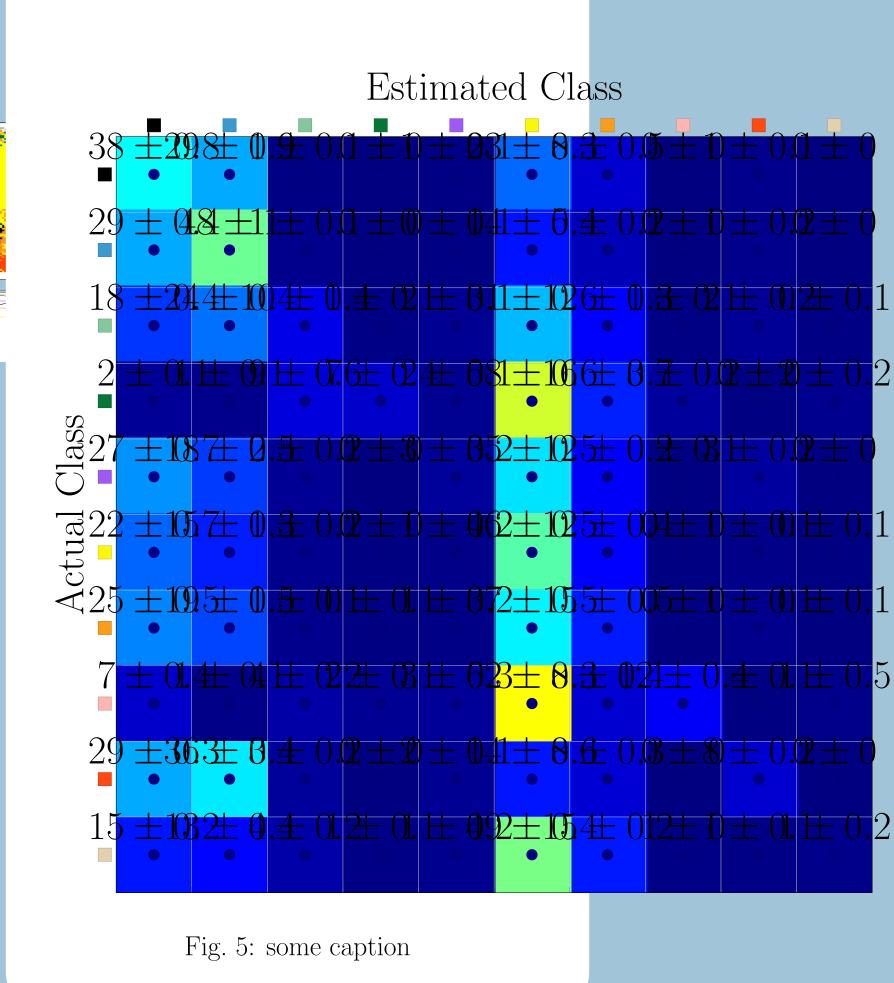


Fig. 2: Distribution of the SIFT descriptors for some classes in the GT.







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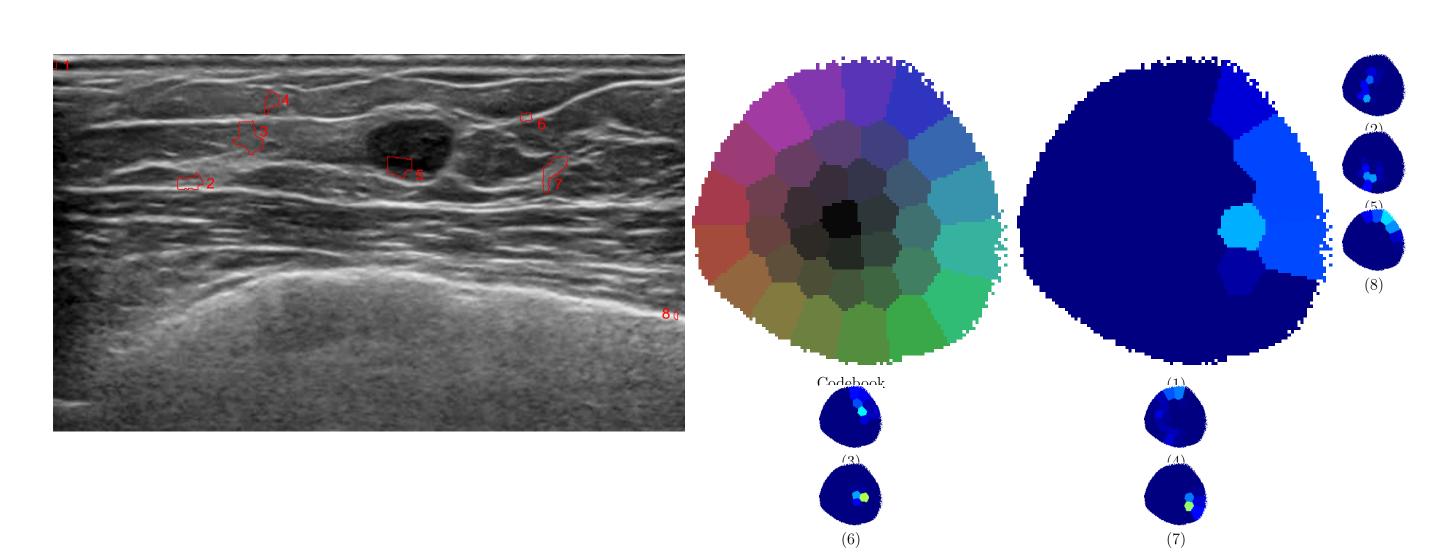


Fig. 6: SIFT-BoF descriptors qualitative analysis. (Left) image example. (Right) Dictionary representation colored using the location in fig. ??a space. (1-8) Occurrence of the dictionary's key-points associated to each region highlighted in the original image.

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