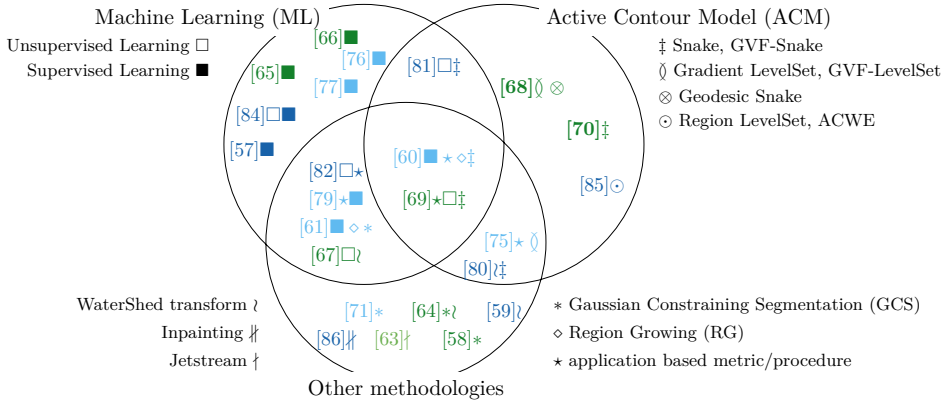

Figure 2.3: Conceptual map of the segmentation strategy used in the methodologies reported in figure 2.2. The methods have been grouped according to the segmentation methodology: ML,ACM or others. Each circle has its own iconography representing the sub-strategies that can be found in each class. The color here is used to represent user interactability being: fully guided (dark-green), semi-automatic (light-green), auto-guided(light-Blue), and fully automatic(dark-blue).

performance than GVF-Snakes [111].

However, taking everything into consideration, the segmentation results when using ACM are highly dependent on the correctness of the contour initialization. In contrast, Liu et al. [85] proposed using a model driven LevelSet approach which can use an arbitrary initialization. In this case, the initial contour is a centered arbitrary rectangle. The contour evolves, forcing the intensity distribution of the pixels of the inner part of the contour to fit a model Probability Density Function (PDF) obtained from a training step. Since it uses region information, a rather naive initialization can be used.

2.2.2 The role of Machine Learning (ML) in breast lesion segmentation

When addressing the lesion segmentation problem, two subproblems arise: a) properly detecting the lesions; and b) properly delineating the lesion. In the literature, ML has proven to be a useful and reliable tool, widely used to address either one of those two subproblems or both (either in a daisy-chain manner or at once). ML uses elements with a provided ground truth