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CRF-based Localization and Labeling and Section-Wise Agnostic V-Net Segmentation of Intervertebral Discs in Multi Modality MR Images

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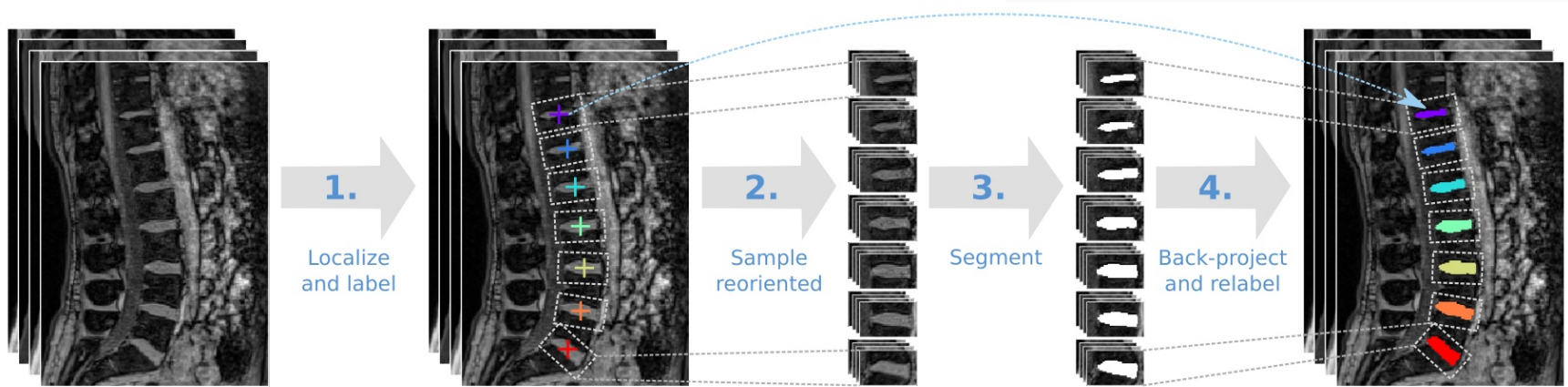
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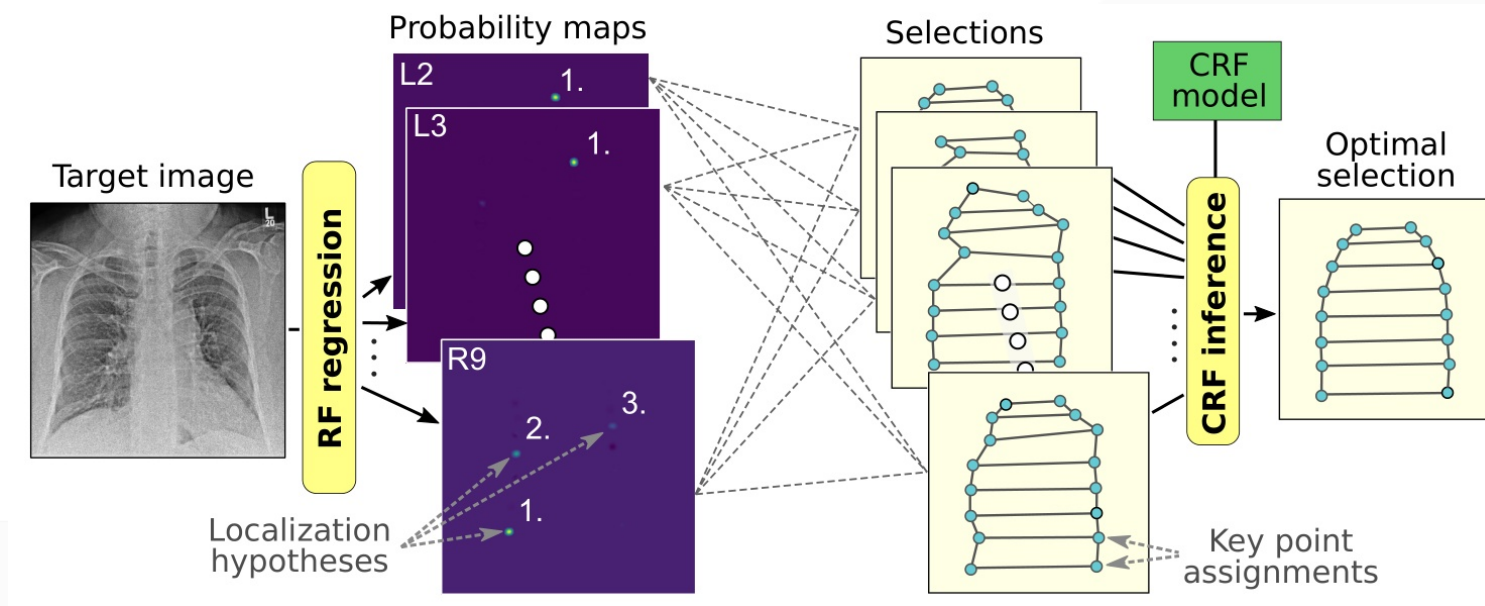
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Method



- **General key point detection and localization** method to **find labeled centroids** of IVDs (combination of random forests with conditional random fields)
- **Reorientation of fixed-size sections** sampled around the IVD centroids
- **IVD agnostic V-Net model** to segment IVD tissue

Key point localization



- Use random forests to regress probability maps for each key point based on simple intensity difference features
- Apply a conditional random field to perform spatial regularization between the different key points

Results

- 8-fold cross validation (14 training and 2 test cases)
- Processing one cases takes less than 10 seconds
- Average **Dice coefficient of 0.894**
- Mean **surface distance of 0.45mm**

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for discussion!**