

## P097

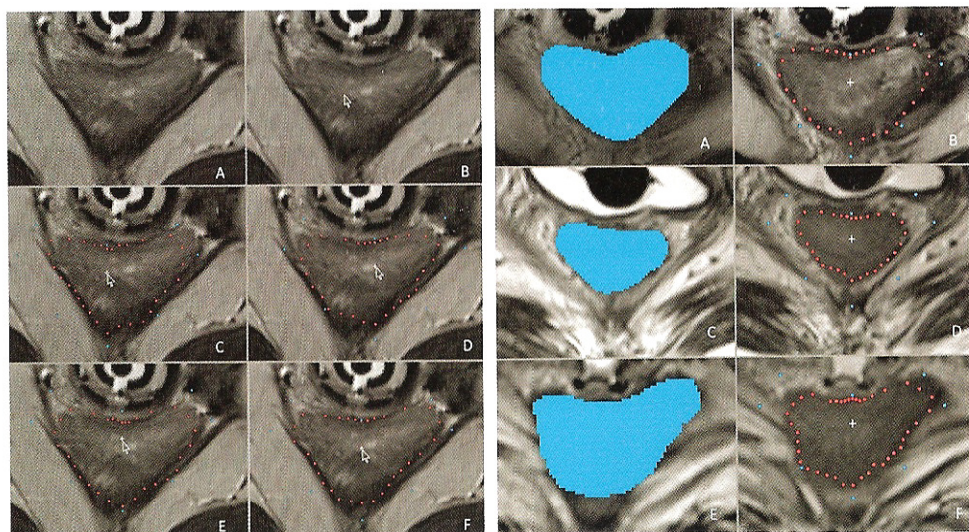
### Rectum Segmentation In MR-guided Gynecologic Brachytherapy Data

Lueddemann, TL<sup>1</sup>; Egger, JE<sup>2</sup>

<sup>1</sup>Technical University of Munich, Germany; <sup>2</sup>University Hospital of Marburg, Germany

**Background:** Among all cancer types, gynecological malignancies - including endometrial, vaginal/ vulvar and cervical cancers - belong to the 4th most frequent type of cancer among women. Besides chemotherapy and external beam radiation, brachytherapy is the standard procedure for the treatment of these malignancies. In the progress of treatment planning, segmentation of the tumor as the target volume as well as segmentation of adjacent organs of risks is crucial to accomplish an optimal radiation distribution to the tumor while simultaneously preserve healthy tissue. This contribution presents the initial results of contouring the rectum with a novel interactive graph-based segmentation method based on a user-defined template.

**Methods:** The proposed method uses a graph-based segmentation scheme and extends it to an interactive approach with a user-defined template. In summary, the scheme creates a directed 2D graph, followed by the minimal cost closed set computation on the graph, resulting in an optimal outlining of the rectum. Thereby, the graph's center can be interactively dragged to compute a further segmentation and optimize the result. Image 1 demonstrates the interactive segmentation process: original dataset (A), interactive moving of the graph's center (B-E) with real-time feedback of the rectum contour (red) and resulting segmentation (F) after a satisfying outline of the rectum has been achieved.



**Results:** Six intraoperative T2-weighted MRI datasets acquired with a Siemens 3T scanner at the

Brigham and Women's Hospital have been used for this initial study. Segmentation of the rectum could successfully be performed in all cases. For visual side-by-side inspection Image 2 presents three manual segmentations (A, C and E, blue) and the corresponding interactive segmentations (B, D and F, red). For all segmentations the same template has been used (blue dots in the right images) and no parameter definitions were required from the user.

#### Abstract Topic

Cervix