

# IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING

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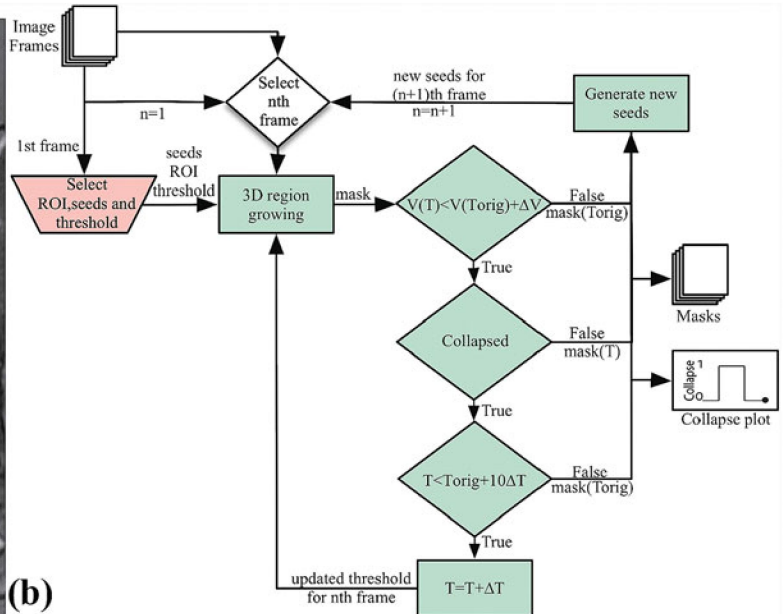
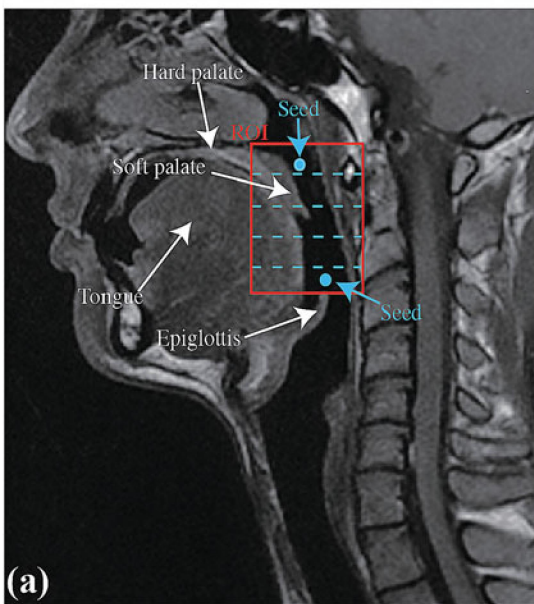
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**Segmentation Procedure.** (a) Graphical representation of ROI placement, seed placement, and division of airway into five sections for generation of new seeds. (b) Flowchart illustrating the entire procedure. An ROI is manually selected (red), two seeds are placed within the ROI, and a threshold ( $T_{orig}$ ) is determined based on the first frame.

The first frame is segmented using automatic region growing (green). The threshold is increased by  $\Delta T$  and segmentation is repeated if volume of airway is less than the segmented volume using original threshold plus  $\Delta V$ , collapse is detected, and threshold is less than original threshold plus  $10\Delta T$ . Two new seeds for subsequent frames are generated using segmented masks. See “Dynamic 3-D MR Visualization and Detection of Upper Airway Obstruction During Sleep Using Region-Growing Segmentation,” by Javed *et al.*, p. 433.

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