

AbstractID: 10847 Title: Deformable Fusion and Atlas Based Autosegmentation: MimVista vs. CMS Focal ABAS

**Purpose:** To compare two commercial atlas based auto segmentation (ABAS) contouring algorithms designed to expedite delineation of target volumes and organs at risk (OAR). Metrics include time to generate contours, and accuracy with respect to physicians' manual delineation volumes.

**Method and Materials:** CMS FocalAbas and MimVista Atlas Segmentation were compared. Ten IMRT head and neck CT scans with physician-drawn volumes were randomly selected. The scans were sent to MimVista where the CT scan was matched using deformable atlas segmentation to one of 57 atlas patients. The identified atlas patient was then transferred to the FocalAbas Atlas database. This allowed each system to run its auto segmentation process on the same blank CT scan with the identical atlas patient making differences solely a function of the software or hardware.

**Results:** Four OARs were compared to physician volumes using the Dice index. The range of the index for cord was FocalAbas 0.23-0.50 and MimVista 0.26-0.66; for brainstem, FocalAbas 0.11-0.68 and MimVista 0.13-0.73; for right parotid, FocalAbas 0.14-0.70 and MimVista 0.18-0.60 and for left parotid, FocalAbas 0.09-0.77 and MimVista 0.29-0.60. The mean index of all volumes was FocalAbas  $0.44 \pm 0.17$  and MimVista  $0.48 \pm 0.15$ , the two-tailed P-value=0.0443, which is statistically significant. Inter-physician volume indexes have been documented at 0.7. The mean time to execute the ABAS was 00:11:11 on FocalAbas (HPXW8400 Workstation+Intel Xeon5160, 3.0GHz, 6.0G Ram) and 00:05:49 on MimVista (HPXW6400 Workstation+Intel Xeon 5150, 2.66GHz, 2G Ram).

**Conclusion:** This study revealed that neither ABAS of OARs out-performed the other. Although there is the need for improvement of the algorithms to attain a higher coefficient of agreement to physicians' delineations, these tools have been proven to generate a good first draft of clinical volumes and thusly reduce physician contouring time by sixty percent.