CT Liver Analysis

Purpose

Automatically identifies, segments and quantifies the liver from the portal venous phase of a tri-phase liver scan and classifies the hepatic and portal veins.

Benefits

- Semi-automatic segmentation methods to segment the liver (i.e. Couinaud) and provides tools to analyze and quantify the whole liver, liver segments and user-defined regions of interest.
- Enables virtual hepatectomy, providing volumetric estimates of resected and residual liver segments.
- Results from CT Liver Analysis can be loaded into MMTT and vice-versa.
- Segmentations of the whole liver, liver segments, vasculature and findings can be exported as RT Structures.

Before you begin

Send preferred images to the IntelliSpace Portal. Portal Venous phase will best demonstrate both Portal and Hepatic veins of the liver.

Workflow

To process Liver segmentation and ablation or surgical planning exams:

1. From the **Patient Directory**, select the study and series and click 

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   The application opens and loads the study, and performs segmentation automatically. You can immediately visualize the Portal and Hepatic veins using the images and color key located in left navigation pane under **Select Tissue**.

Tip A feature of the IntelliSpace Portal v118.0 is the ability to capture and save key images and displays. To capture a key image, select the image and press **SPACE** on the keyboard. To capture key displays, press **SHIFT** + **SPACE** on the keyboard

2. In the left **Navigation** pane, click  (the drop-down arrow) and select **Findings**.
3. Under **1. Draw New Finding**, do one of the following:
   - Click  (**Draw smart ROI 3D**) to draw the ROI using a pencil tool.
   - Click  (**Draw smart Brush 3D**) to draw the ROI using a brush tool.

Note Tools such as scrolling, rotating, changing the orientation, and panning are available during this stage by using keyboard, mouse shortcuts or arrow keys.

4. Click  (the Forward arrow) next to **Segmentation** to move to step 2, **Liver Segments**.
5. Click  (**Number of segments**) to access the list of division options and identify the number of segments.
6. Select the division option that best suits your needs. The system lists the segments under **2. Define Segments**.
7. Do one of the following:
   - To manually define the segments, click  (**Add landmark**), select the segment in the list of segments in the left navigation pane, and place a landmark within the segment.
   - To use the show segmentation guidance as a prompt during this process, click  (**Show segmentation guidance**) and place landmarks as indicated in the Segmentation guidance window.

Note The **Segmentation guidance** window can be moved anywhere on the screen as well as resized as needed.

8. Click  (**Show Summary Table**) to display and review measurements.
9. At this point in the workflow it is recommended to save results and save a bookmark:
   - To save the images, click  (**Save as**) and select the way you want to save the images.
   - To bookmark the images, click  (**Bookmark**) and set the bookmark in the **Save Bookmark** dialog box.
10. Click  (the Forward arrow) next to Liver Segments to move to step 3, **Surgery Planning**.
11. Do one or more of the following:
    - To remove an anatomical resection, click  (**Resect Segment**) and select the segment you want to remove.
    - To perform atypical resection and define the lobe or segment being planned for resection, click  (**Exclude FreeHand 3D**) and  (**Include FreeHand 3D**). The volume image in the top right viewport removes the segment and in the other viewports, the segment is shaded a different color.
    - To analyze volume and percentage information for both resected and remaining segments, click  (**Show Summary Table**).
12. Do one or more of the following:
    - To save the images, click  (**Save selected images as…**) and select the way you want to save the images.
    - To save tables in non-DICOM format, click  (**Save all tables as…**).
    - To save a key image(s), in the left Navigation pane click the  (drop-down arrow) and select **Key Images**. Then select a single image and right-click  or press **Ctrl** on the keyboard, select multiple images, and click  .
    - To bookmark the images, click  (**Bookmark**) and set the bookmark in the **Save Bookmark** dialog box.
    - To send the final images to the reporting package, click the drop down next to the displayed reporting option and click  (**Send selected images to Report**).
    - To send the Surgical Planning results to the report, click the drop-down arrow next to the displayed reporting option and click  (**Send results to report**).

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