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S8 UI Spec - Segmentation

VO.1, Sun Feb 22 2015

DRAFT

SIGNATURE

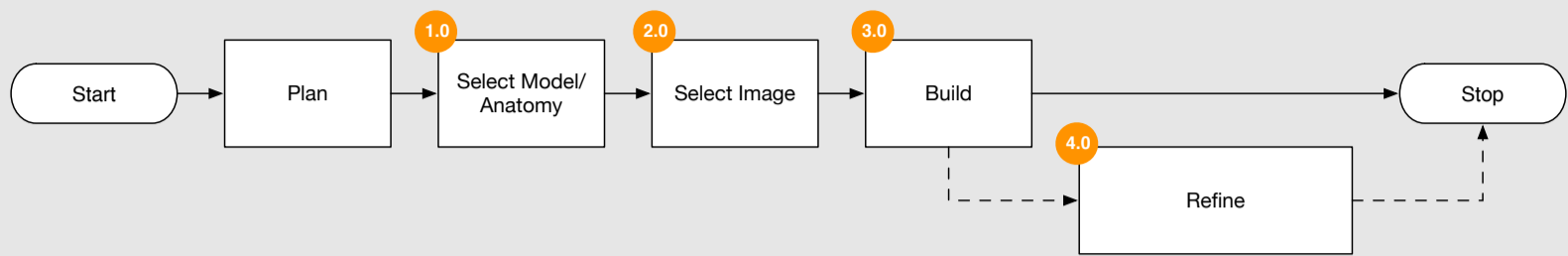
Document approvals are maintained using electronic signatures in the PLM system.

REVISION	AFFECTED AREAS	AUTHOR
1	Initial draft	G. Alban

Notes

Items which are Critical to Function elements are presented in **red text** (and should be tested).
All other items are to provide guidance to ensure design intent.

S8 UI Spec - Workflow Overview

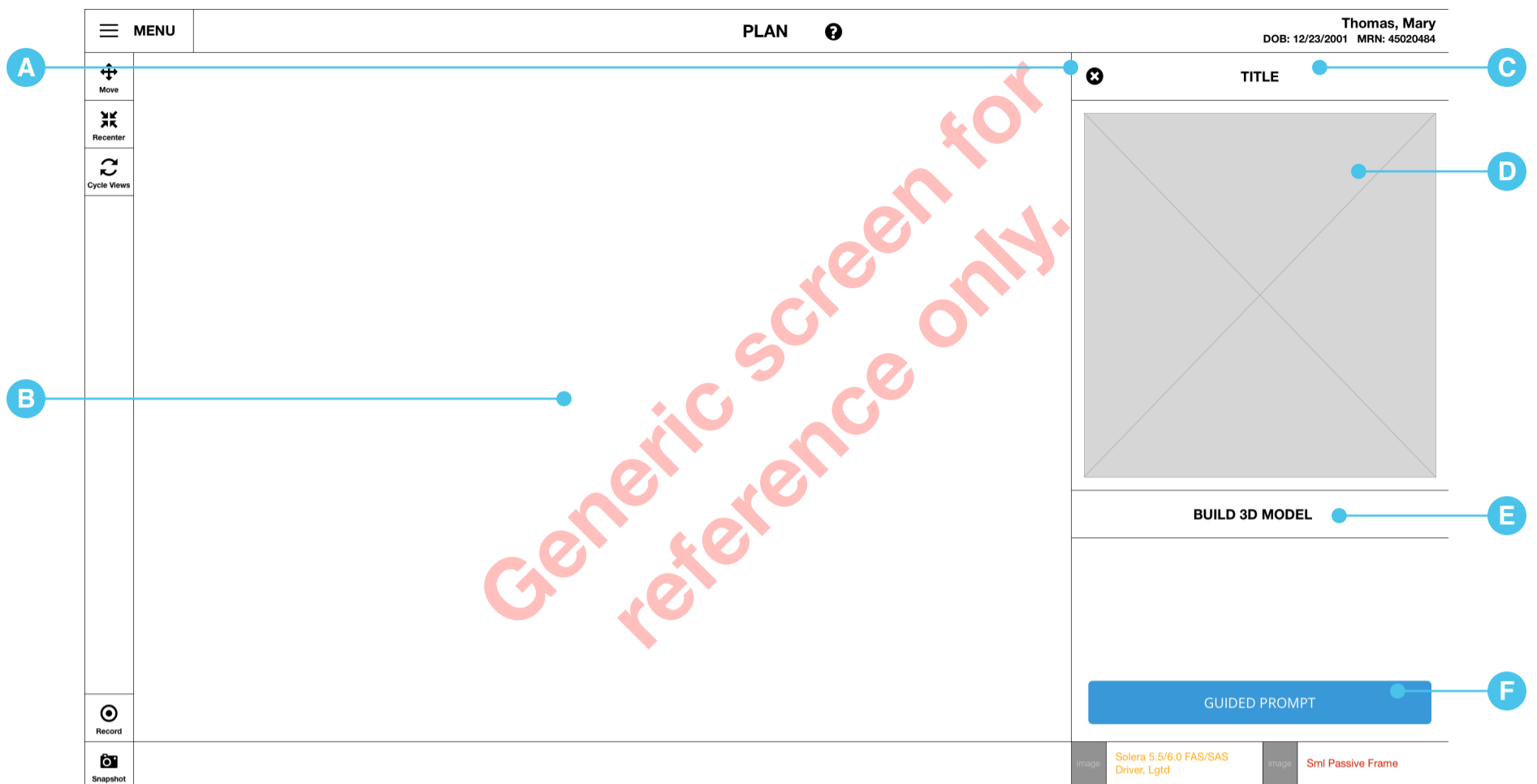


Description

The diagram above illustrates the Segmentation workflow, illustrated as accessed through “Plan” (or “Navigation”). This UI Spec defines the steps annotated 1.0 through 4.0.

Comments

S8 UI Spec - Plan/Navigation



A. Exit Task button/icon

1. Details of this right panel TBD. (Based on "Navigation" and "Plan" UI Specs.)

B. Prompt text

1. Details of this right panel TBD. (Based on "Navigation" and "Plan" UI Specs.)

C. Access via Navigation and Plan

1. "Build 3D Model" will be accessed via "Navigation" and "Plan" tasks.
2. Details of this screen TBD.

D. Segmentation content block (TBD)

1. Details of this right panel TBD. (Based on "Navigation" and "Plan" UI Specs.)

E. Build 3D Model button

1. The user may create a new segmented model by selecting "Build 3D Model." This will take the user to the 'Select Model' step (page 5)

F. Guided prompt button (TBD)

1. When pressed, progresses the user to (TBD) screen.

Description

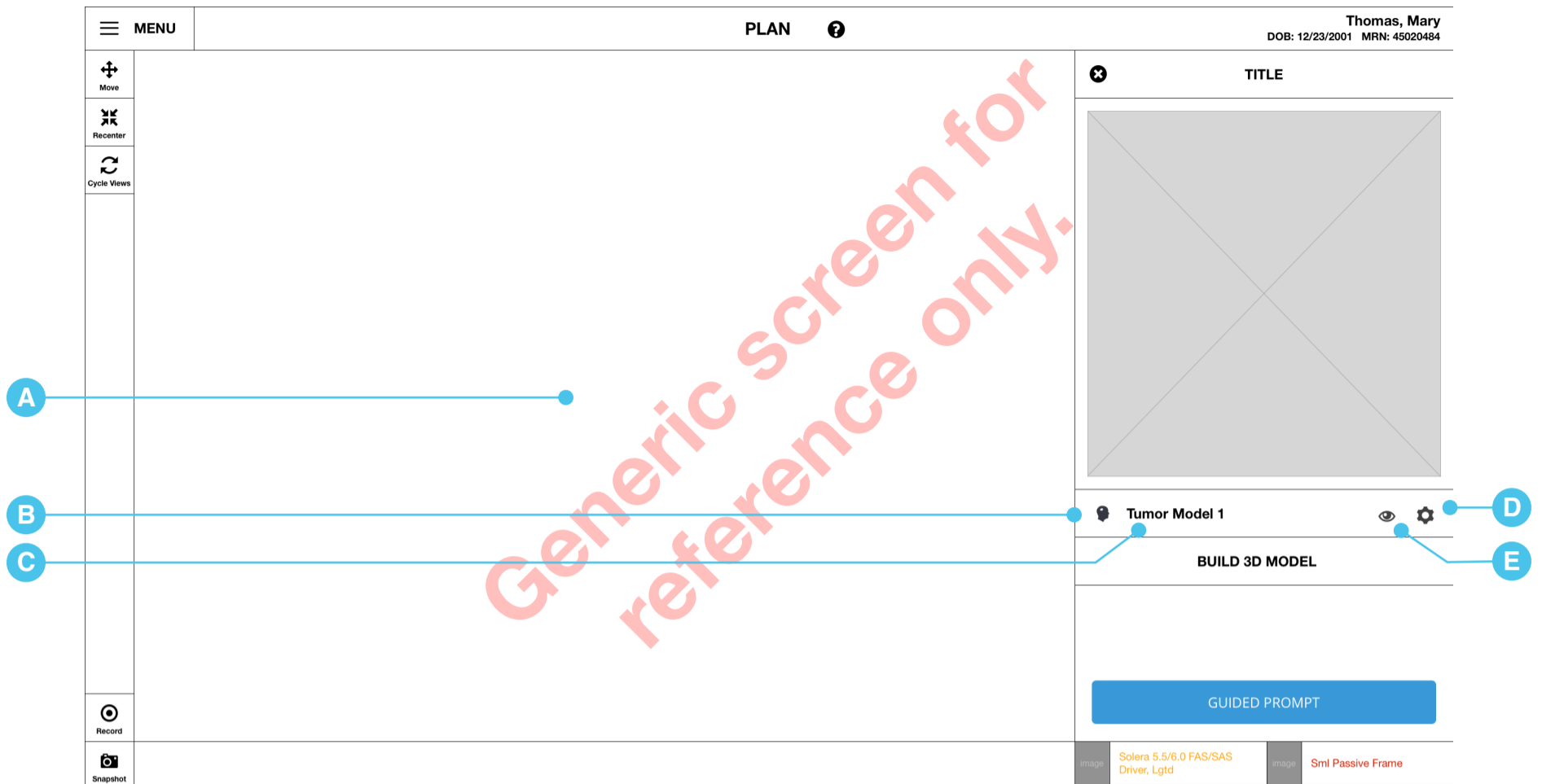
The user may create new segmented models or edit existing segmented models using the Segmentation workflow accessed via the "Plan" or "Navigation" tasks. Access to the Segmentation workflow comes from the "Build 3D Model" button in the right panel.

Navigation

Access the Segmentation workflow by selecting 'Build 3D Model' from the right panel.

Comments

S8 UI Spec - Plan/Navigation (w/Model)



A. Prompt text

1. Details of this right panel TBD. (Based on "Navigation" and "Plan" UI Specs.)

B. Created model

1. Once a model has been created, the model is displayed above the "Build 3D Model" button in the right panel.
2. An icon associated with the assigned 3D Model card's segmentation category is displayed

C. Anatomy label

1. The segmentation name followed by a number.
2. Names include: bone, cortex, ventricles, vessels, tumor and other
3. Numbers help to indicate different models of the same category (IE 'Tumor 1', 'Tumor 2')
4. The number assigned is determined by the order they were created.

D. Setting icon/button

1. Selecting the settings icon takes the user to the associated Models 'Refine' step (see page 9)

E. Visibility icon/button/toggle

1. Changes the associated Model's preset visibility on/off of both the 2D and 3D views.
2. Toggling the visibility changes the icon to reflect the state it's in.

Description

As the user builds 3D models the list will show all previously created segmented models in the order created.

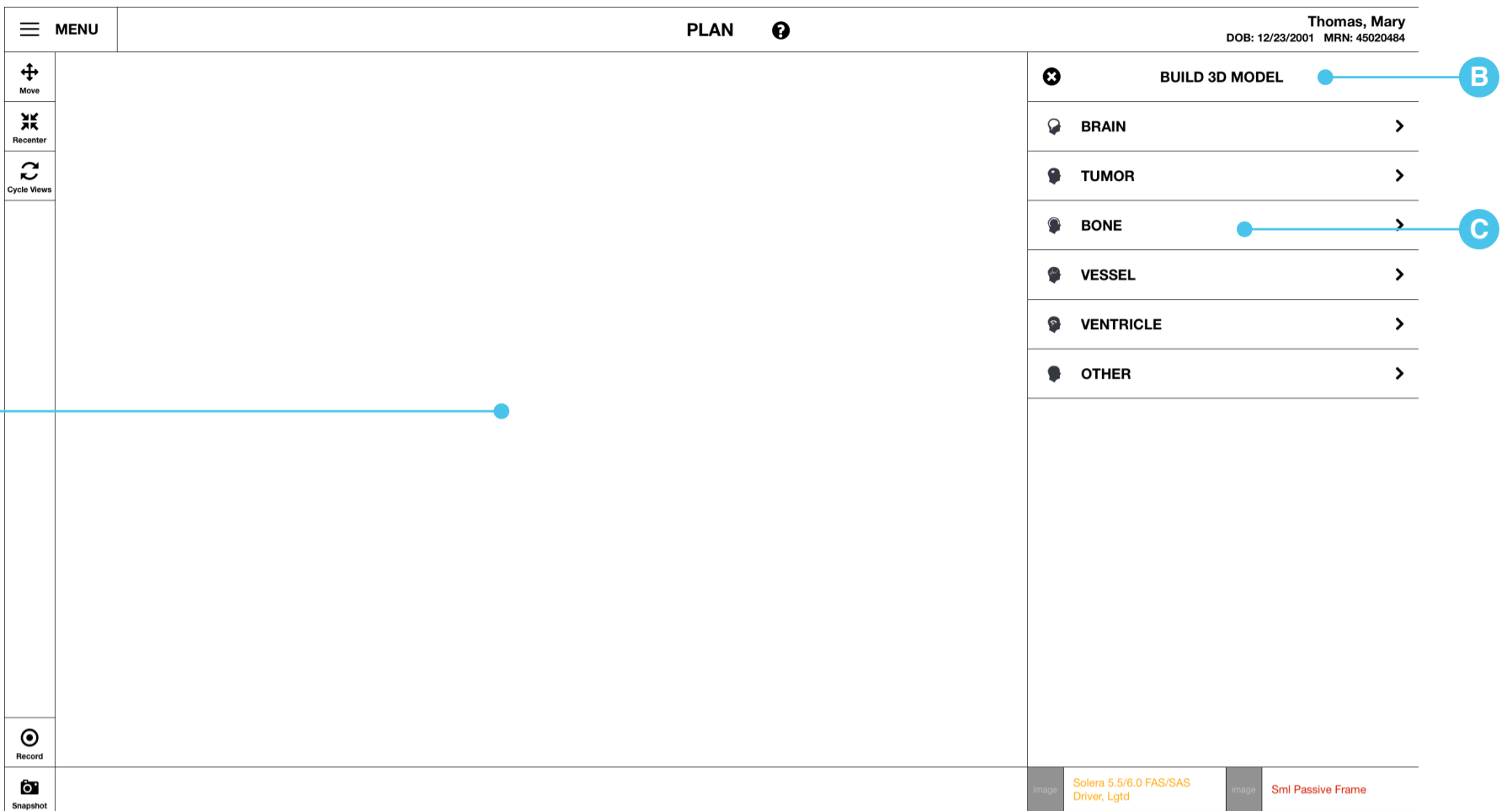
Navigation

Access the Segmentation workflow by selecting 'Build 3D Model' from the right panel.

To edit a previously created 3D model, access by selecting the model name from the right panel.

Comments

S8 UI Spec - 1.0 Select Model/Anatomy



A. Prompt text

1. A message will be shown in the center of the views window guiding the user through creating or editing models.
2. Displays message "To proceed, select a model on the right."

B. Title text

1. Displays name of this Segmentation sub-step: "Build 3d Model"

C. 3d Model cards

1. All available segmentation anatomy to the selected procedure are listed. Only 1 of each.
2. Segmentation anatomy include: Brain, Tumor, Bone, Vessel, Ventricle, and Other
3. An icon associated with the assigned 3D Model card's segmentation category is displayed.
4. Once the user selects one 3D model to build, the workflow progresses to 'Select Scan' (See page 5)

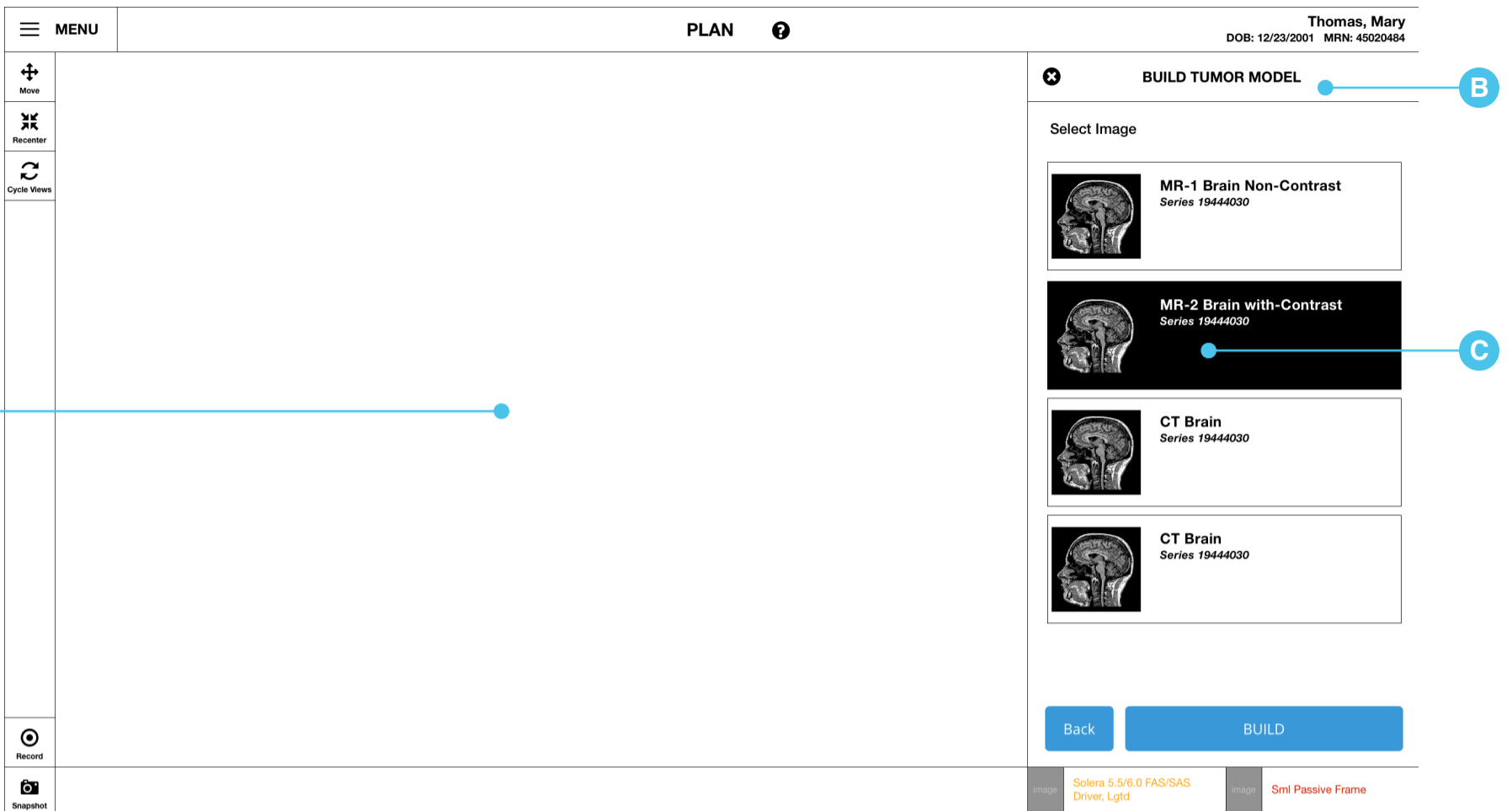
Description

The user may create new segmented models by selecting the navigation points for each model/anatomy type in the right panel.

Navigation

Comments

S8 UI Spec - 2.0 Select Image



A. Prompt text

1. A message will be shown in the center of the views window guiding the user through creating or editing models.
2. Displays message "To proceed, select a scan on the right."

B. Title text

1. Displays name of this Segmentation sub-step based on what model the user selected to create.

C. Image cards

1. Displays all added patient scans (images).
2. Automatically advances the user to the 'Build' step once a scan is selected.
3. Image cards show a thumbnail of the scan, scan name, and series number.
4. Reference (TBD UI SPEC) for detail definition of patient image cards.

Description

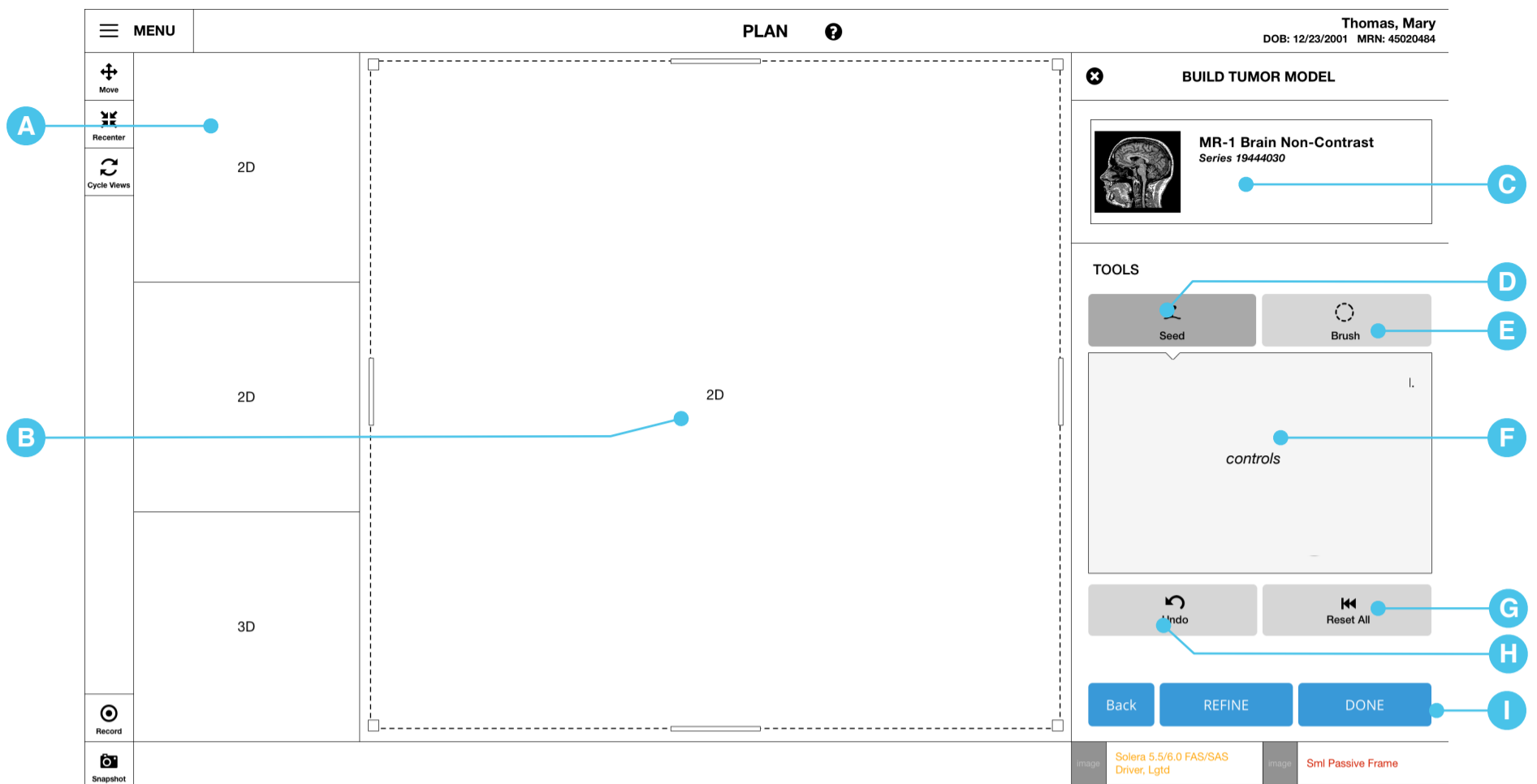
The user may create new segmented models or edit existing segmented models using the Segmentation workflow.

Navigation

Select an image set to create a 3D model through the cards listed in the right panel.

Comments

S8 UI Spec - 3.0 Build



A. Viewport

1. Displays previously selected scan for user to interact with and isolating intended anatomy.

B. Crop Controls

1. The Crop controls will be available during the build steps and only applies to 2D views.
2. The user may select the "Crop" tool to either define a selected region or restrict the region a segmentation tool will select (e.g. Wand).
3. The Crop box may only be adjusted in the main view. In order to adjust the cropped region in the secondary 2D views, they must be moved to the main view window.
4. The Crop box is initially sized so that is is at the borders of the visible exam.
5. The user may adjust the size of the cropped region in the main view by clicking and dragging the horizontal and vertical borders. Alternatively, the user may click and drag the corner of the cropped region to adjust two axis simultaneously.
6. The Crop box does not appear with the 3D Model.
7. Regions of the image not within the cropped region are darker.

C. Selected Image card

1. Displays previously selected scan
2. Tapping this card moves the user back to the 'Select Scan' step (see page 5)

D. Build Tool button

1. When selected, the control box indicator moves directly below and centered to this button.
3. The build tool title and associated controls are determined by the anatomy type selected in the 'Select 3D Model' step. (See pages 8 and 9)

E. Brush Tool button

1. When selected, the control box indicator moves directly below and centered to this button.
3. The controls are changed to the brush control set (see page 9).

F. Tool Control options

1. The controls are changed to be whatever the tool selected by the user.

G. Reset All Button

1. Returns ALL the brush controls, crop settings, and build tool controls to their default values.

H. Undo Button

1. Undoes the last brush controls, crop settings, and build tool controls action.
2. If nothing is available to undo, the button goes into a disabled state.

I. Guided prompt buttons

1. Selecting back brings the user to the previous step.
2. Refine is only available in the tumor workflow. Selecting refine advances the user to Refine screen. (See page 10)
3. Selecting done commits any work and returns the user to the main landing page.

Description

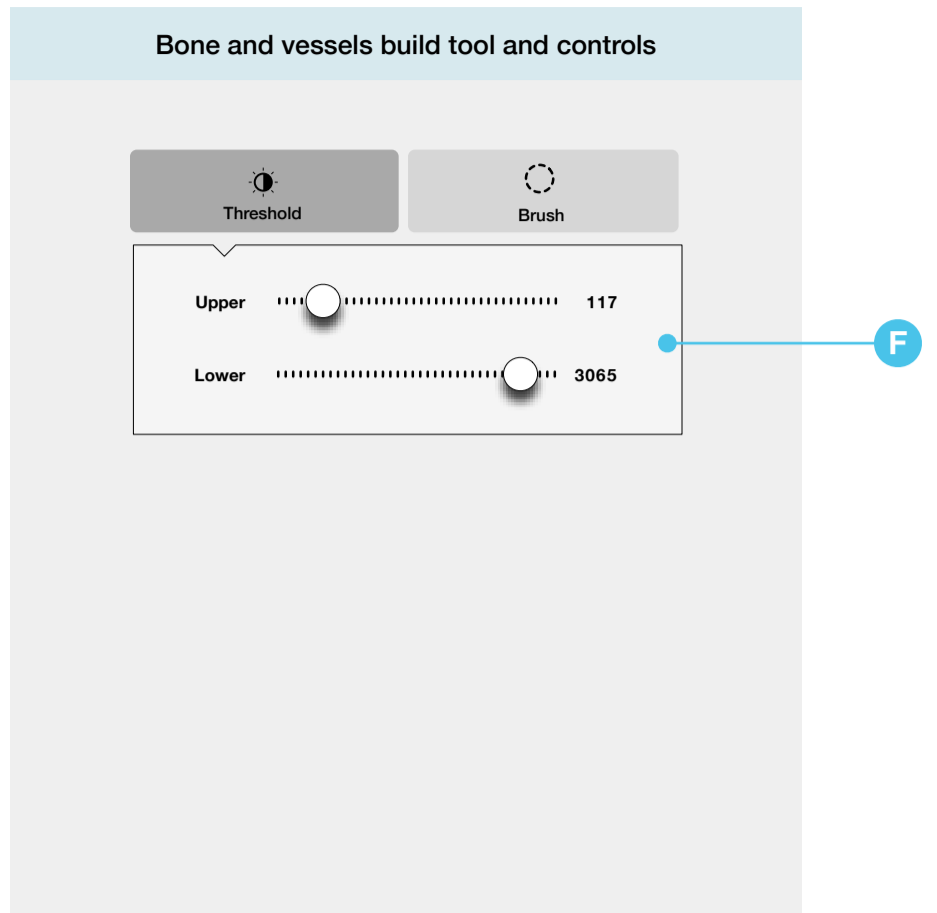
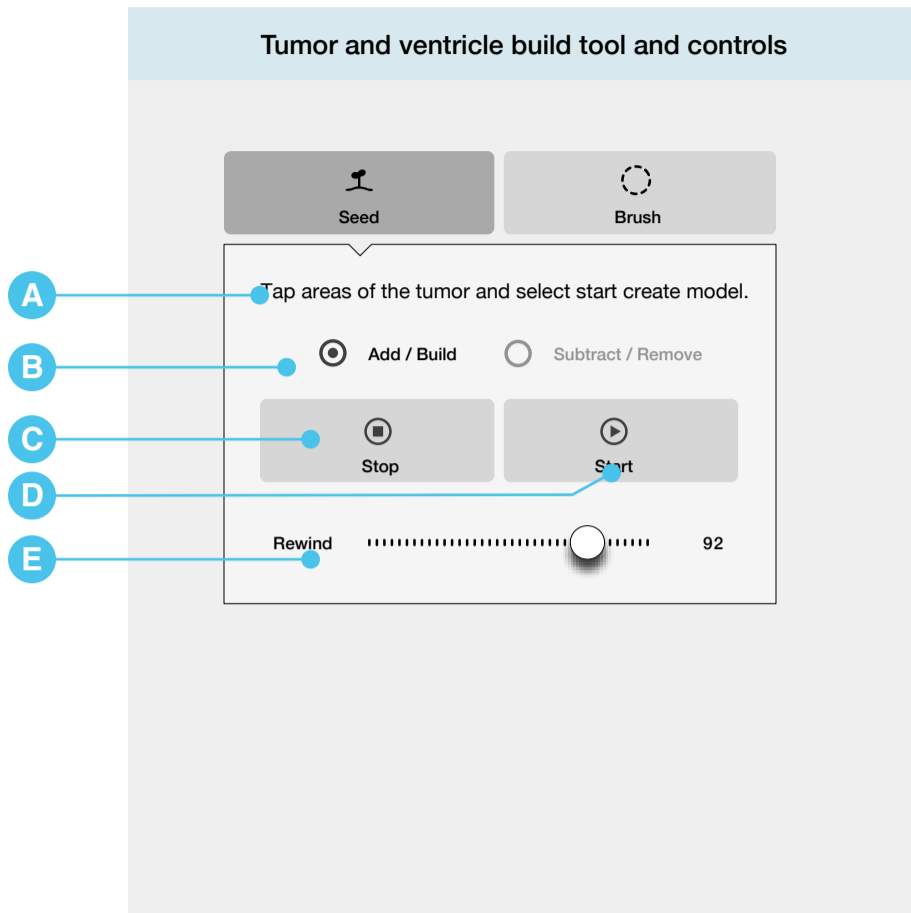
The user may create new segmented models or edit existing segmented models using the Segmentation workflow.

Navigation

Open the segmentation sidebar by selecting '3D Models' from the plan sidebar or through the global menu under the option steps header.

Comments

S8 UI Spec - 3.1 Build Controls



A. Prompt text

1. A message will be shown guiding the user through seeding and editing models.
2. Before any seed points are selected, displays message "Tap areas of the [anatomy type] and select Start to create model."
3. After seed points are selected and during growth animation, displays message "Tap Stop to cancel seed growth"
4. After seed points are selected and grown, displays message "Use Rewind to change final growth stopping point"

B. Seed mode toggle

1. Selecting Add/Build creates segmented anatomy when the user taps areas of the image.
2. Selecting Subtract/Remove removes seed growth selections when the user taps areas of the image.

C. Stop button

1. When seed growth is being calculated, selecting Stop will end the growth at the last calculated selection.
2. If seed growth is not active, the button is disabled.

D. Start button

1. As the user adds seeds to the image, seed growth automatically begins. However, if the user stops the growth or if the seed growth has stopped before the user is satisfied, selecting start will begin the growth from its current selection.
2. If no seeds have been added to the image or if all available pixels are selected, the button is disabled.

E. Rewind slider

1. Once the seed growth has finished calculating, the rewind slider is enabled and moves to 100%.
2. Pulling the slider left rewinds the recorded growth pattern to allow the user to contract the selected anatomy to a previous state.
3. Beginning a new seed resets the rewind control.
4. If no seed growth data is available, the slider is disabled.

F. Threshold sliders

1. The user may manually enter a lower or upper threshold number. If the number is lower or higher than the available range, the number will automatically switch to the nearest valid threshold value.

Description

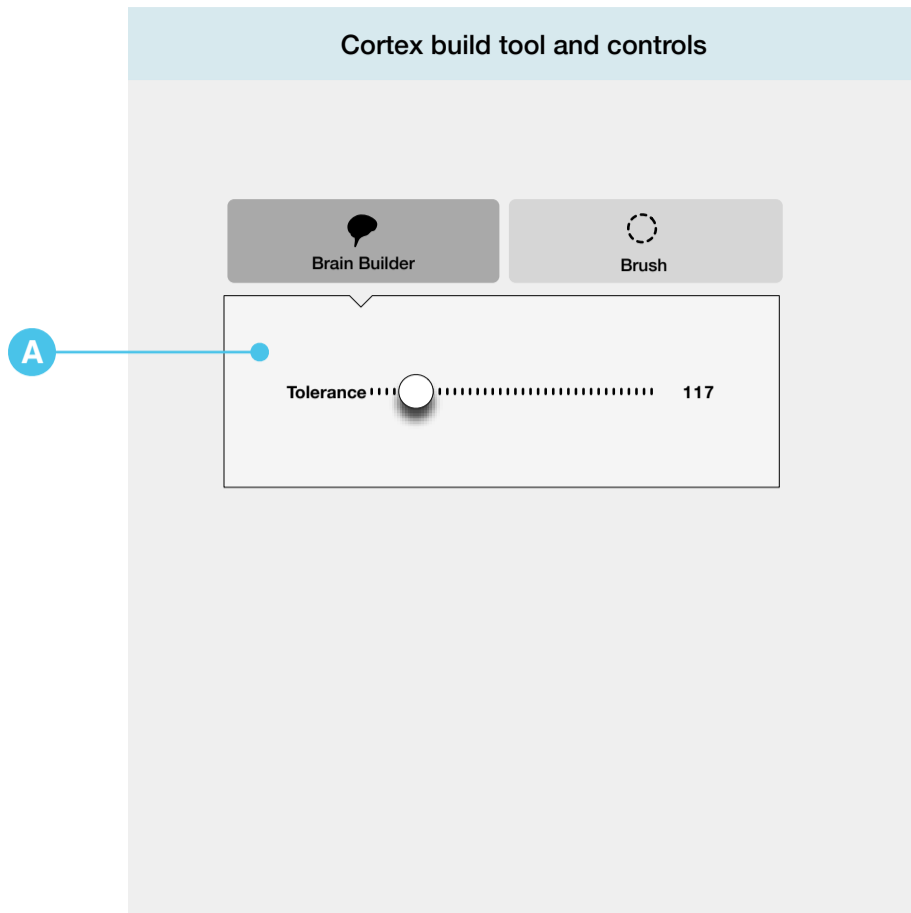
The user may create new segmented models or edit existing segmented models using the Segmentation workflow.

Navigation

Open the segmentation sidebar by selecting '3D Models' from the plan sidebar or through the global menu under the option steps header.

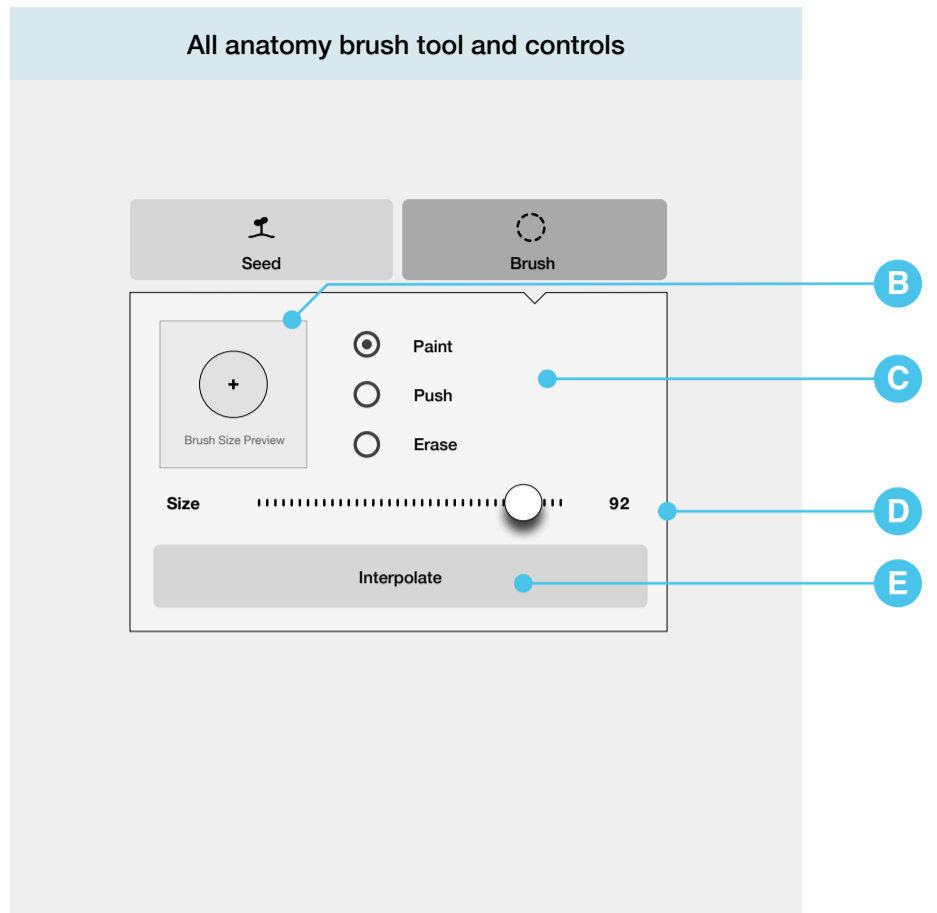
Comments

S8 UI Spec - 3.2 Build Controls



A. Tolerance slider

1. The user may adjust how much brain is retained by the Brain tolerance slider.
2. The selected region will be surrounded by a line in the color selected by the Color menu.
3. After the segmentation process is complete, the 3D Model view will update with the resulting segmentation.



B. Brush Size Preview

1. Adjustments made to the brush size using the size slider are accurately shown in the brush size preview.

C. Brush Size Function Selector

1. The brush tool can function as a brush, push brush, or eraser.
2. The default "Brush" function adds any previously unselected pixel data as the user taps and drags over the viewport images.
3. The user may select the "Push" function to move the border of a previously selected region. The user may click and drag to move (or push) the contour in the direction the brush stroke is moved.
4. The "Erase" function removes any previously selected pixel data as the user taps and drags over the viewport images.

D. Brush Size slider

1. The user may adjust how large/small the brush tool pixel influence is.
2. The user may manually enter a brush size number.

E. Interpolate button

1. The user may "connect" selected regions on separate slices by clicking Interpolate Selections.
2. The Interpolate Selections tool will connect selected regions in the direction to the view (i.e. Axial view: Superior-Inferior)

Description

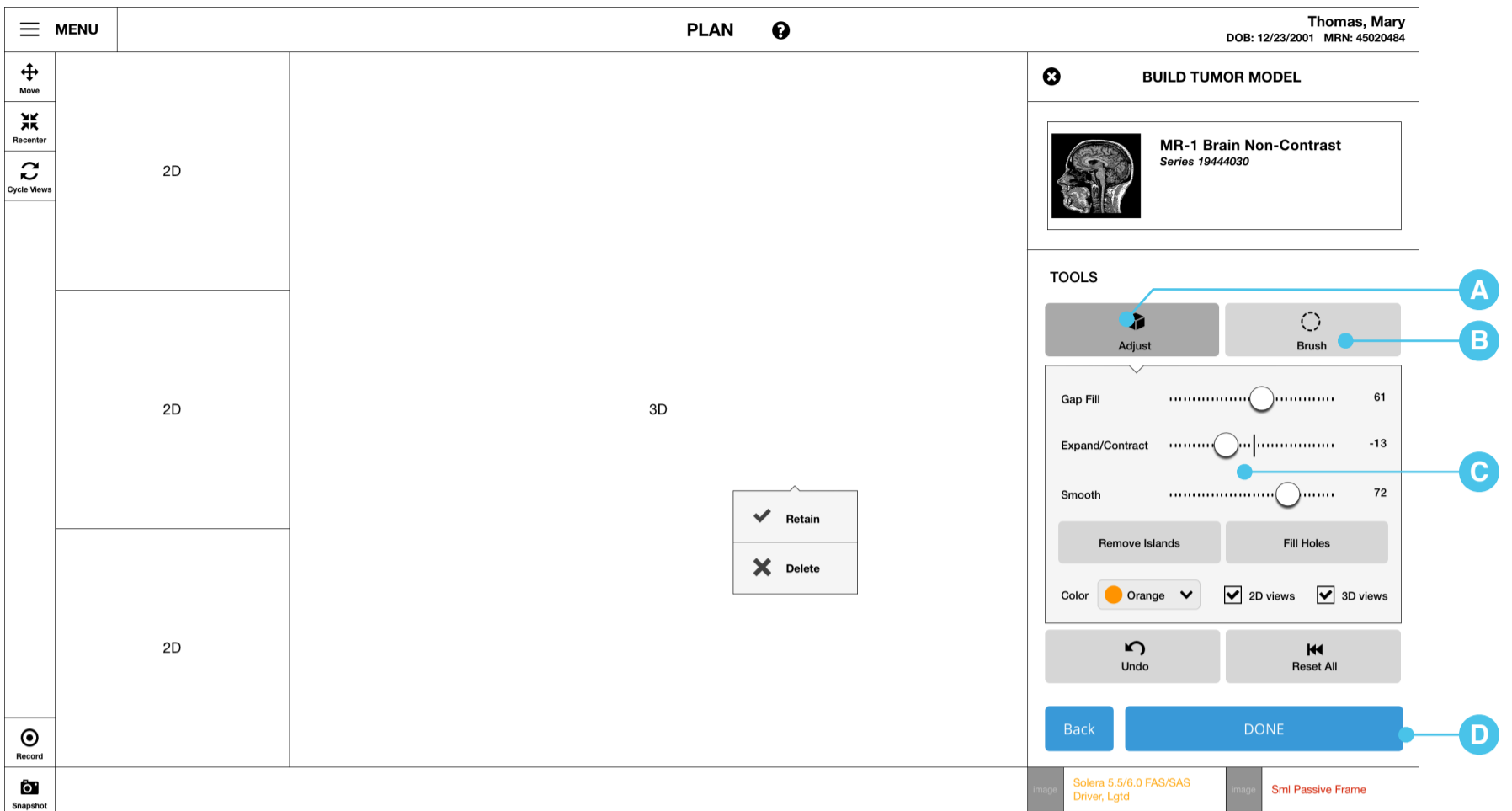
The user may create new segmented models or edit existing segmented models using the Segmentation workflow.

Navigation

Open the segmentation sidebar by selecting '3D Models' from the plan sidebar or through the global menu under the option steps header.

Comments

S8 UI Spec - 4.0 Refine (Tumor Only)



A. Refine Tool button

1. When selected, the control box indicator moves directly below and centered to this button.
2. The controls are changed to the refine control set (see page 10).

B. Brush Tool button

1. When selected, the control box indicator moves directly below and centered to this button.
3. The controls are changed to the brush control set (see page 10).

C. Tool Control options

1. The controls are changed to be whatever the tool selected by the user.

D. Guided promo buttons

1. Selecting back brings the user to the previous step.
2. Selecting done commits any work and returns the user to the main landing page.

Description

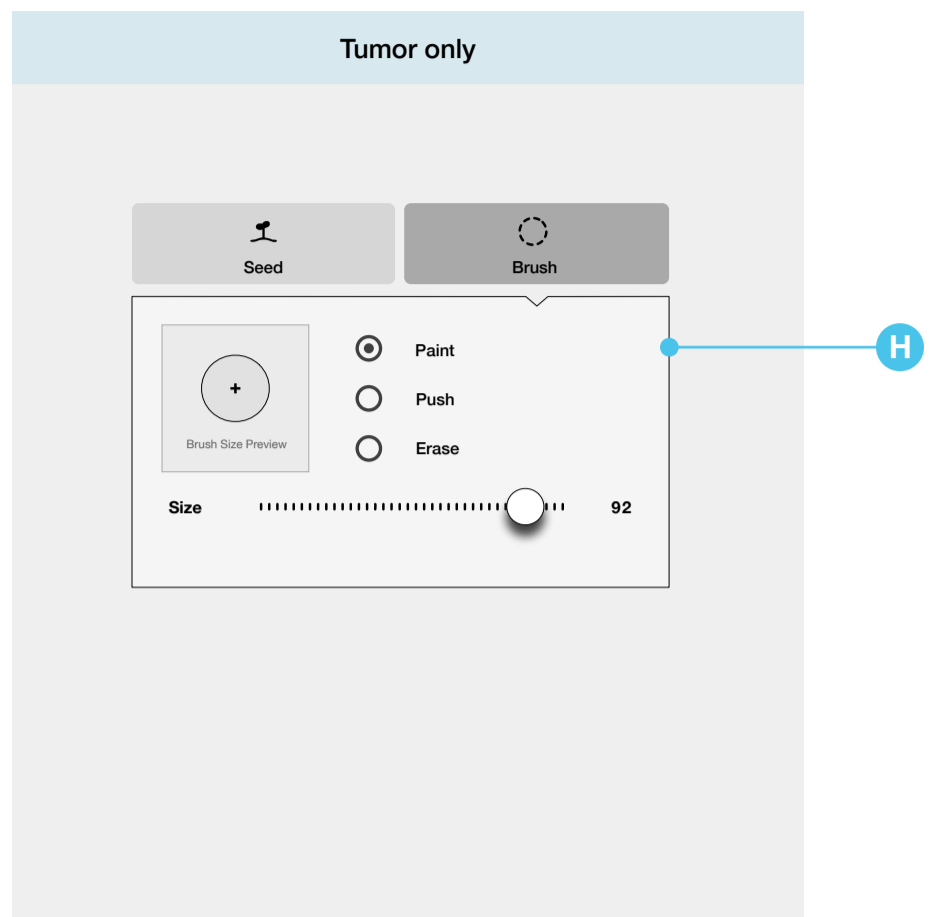
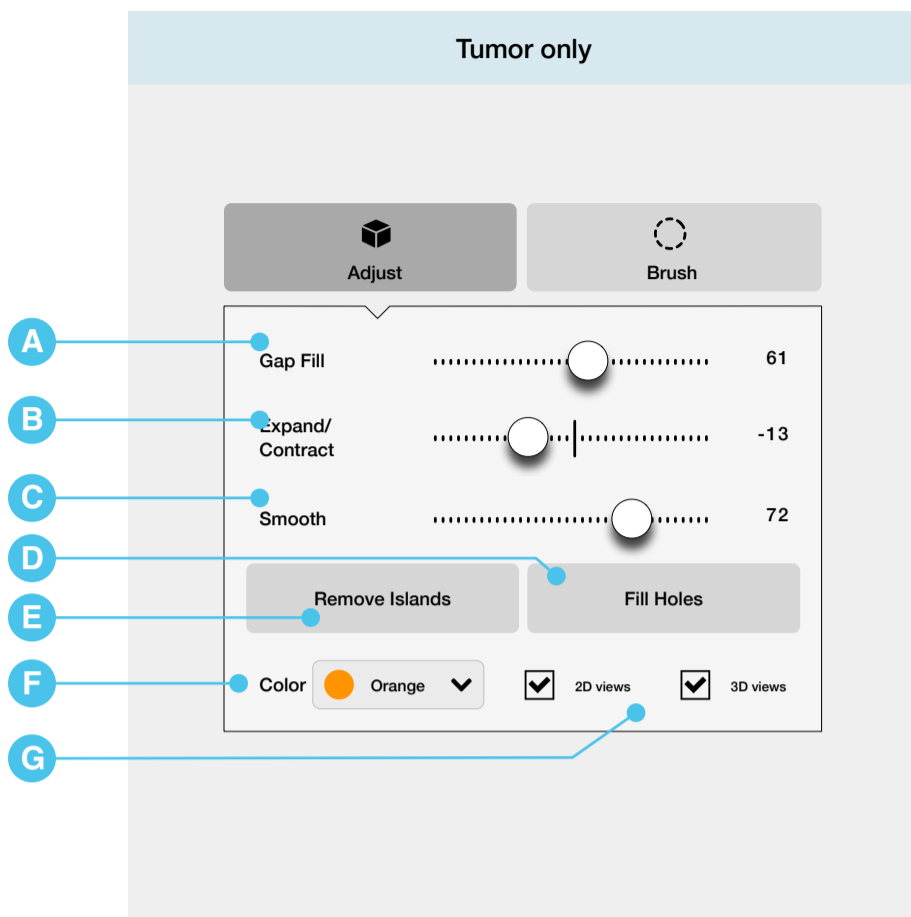
The user may create new segmented models or edit existing segmented models using the Segmentation workflow.

Navigation

Open the segmentation sidebar by selecting '3D Models' from the plan sidebar or through the global menu under the option steps header.

Comments

S8 UI Spec - 4.1 Refine Controls



A. Gap Fill Slider

1. The user may adjust the gap fill effecting threshold. Gaps below the threshold are filled.
2. The user may manually enter a gap fill number.

B. Expand/Contract Slider

1. By default the slider is sitting in the center of the rail.
2. When the user moves the slider to the right, the segmented anatomy expands, when the slider is moved to the left, contracts.
3. The user may manually enter a Expand/contract number.

C. Smooth Slider

1. The user may apply and adjust smoothing to the border of the segmented anatomy.
2. Smoothing decreases the contrasting angular differences along the surface of the 3D model.
3. The user may manually enter a smoothing number.

D. Fill Holes Button

1. The user may select fill holes to remove chasms within the model.

E. Remove Islands Button

1. The user may select remove islands to remove unctiguous segmented noise surrounding the desired anatomy.

F. Color Selection drop down

1. The selected region will be surrounded by a line in the color selected by the Color drop down.

G. Visibility toggles

1. By default both the 2D and 3D visibility is set to 'on'
2. The user can turn the segmented anatomy's visibility on or off in the 2D or 3D viewport windows independently by tapping on the toggles.

H. Brush controls (reference page 8)

1. Omit 'Interpolate' within the Refine screens.

Description

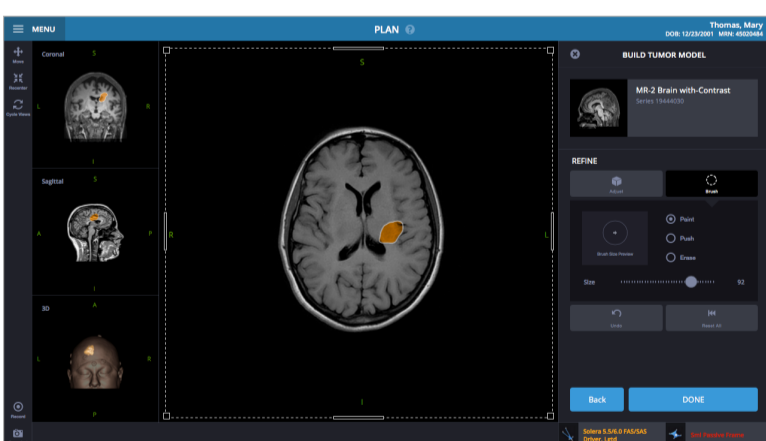
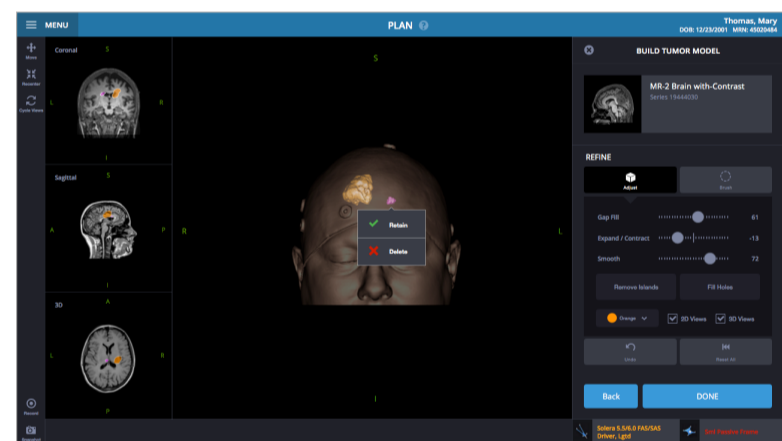
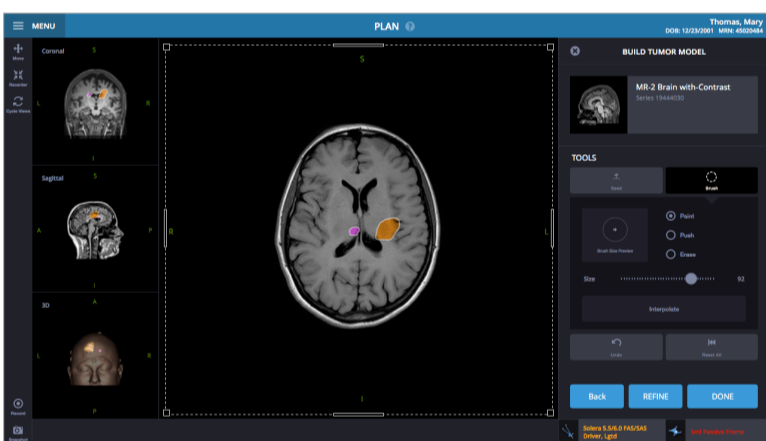
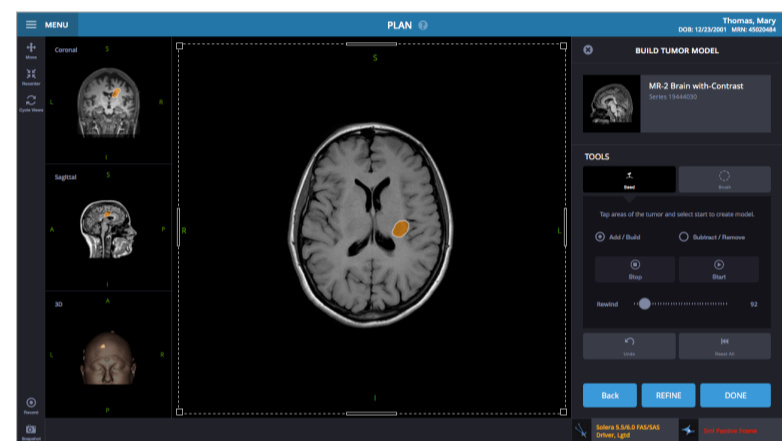
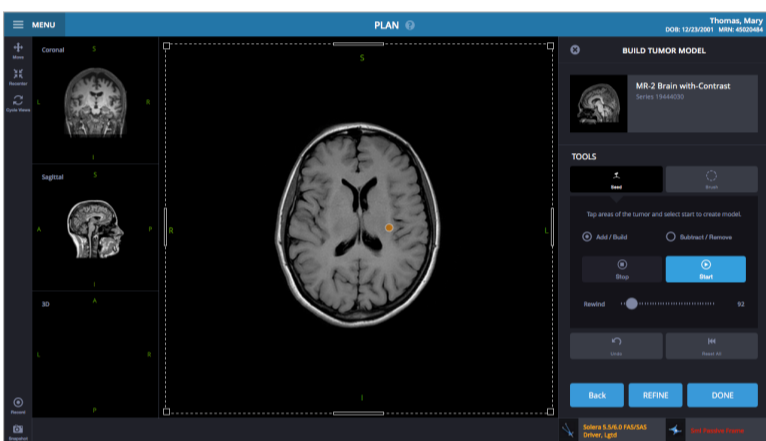
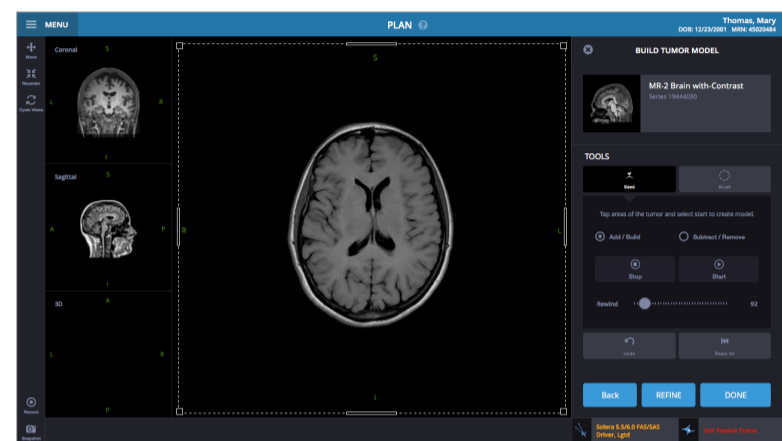
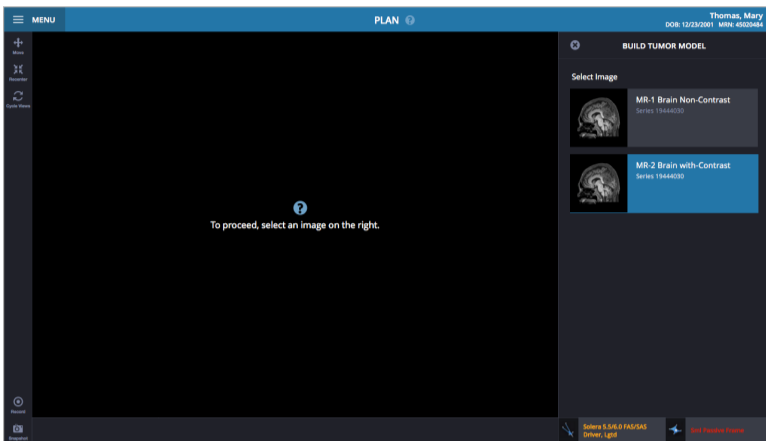
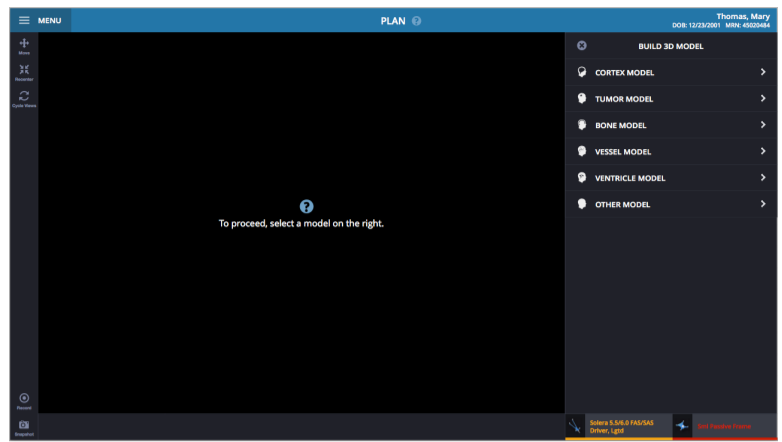
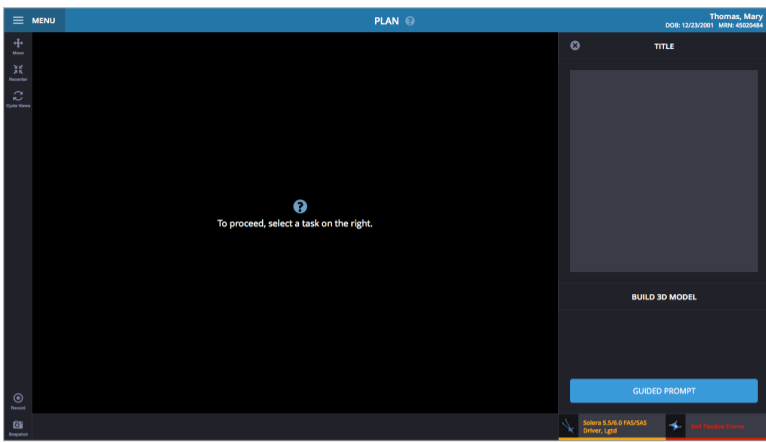
The user may create new segmented models or edit existing segmented models using the Segmentation workflow.

Navigation

Open the segmentation sidebar by selecting '3D Models' from the plan sidebar or through the global menu under the option steps header.

Comments

S8 UI Spec - Mockups



Description

Overview of color mockups of the Segmentation workflow.

Refer to J:/StageGate/Projects/Products/0849_Nvolve_SW_Program/User_Experience/Formative - Stanford 18 Feb 2015 for full walkthrough of workflow.

Comments