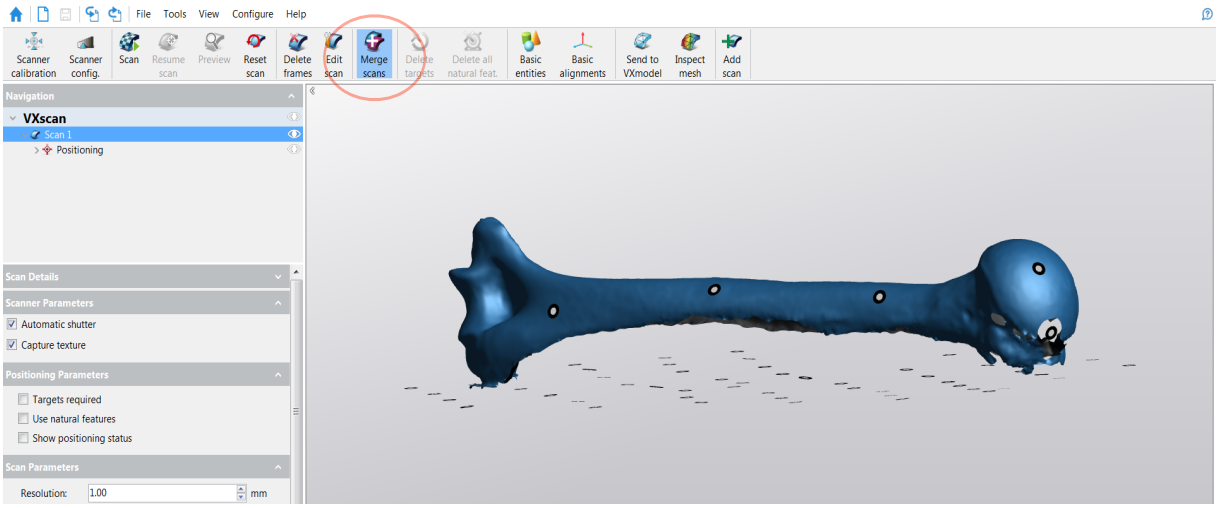
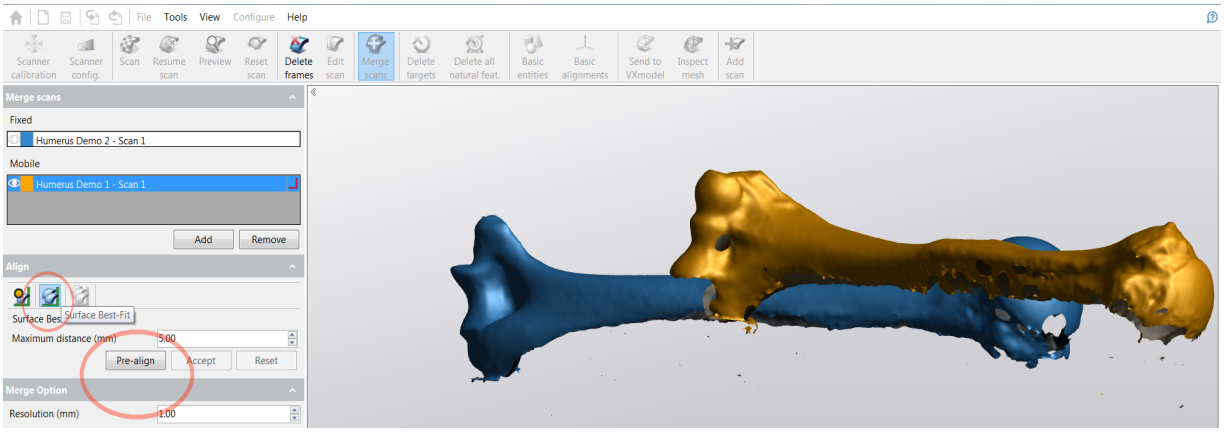
Scan Merging Using VX Elements

1. Open file **Humerus Demo 2** located in the **Scan Merge Demo Folder** of VX Elements Projects scan using **VX Elements.** In the future, it is suggested to trim and delete background and isolated patches that are not important. This will aid in the merging process.

2. Once the file is edited to your liking, click the **Merge Scans** button located in the toolbar.



3. The merge scans tasks window will pop up. Select the **Add** option and import **Humerus Demo 1**.
4. In this demo we will align the scans using the scan's natural features. Under **the Align** section select **Surface Best Fit** and then **Pre-Align**.



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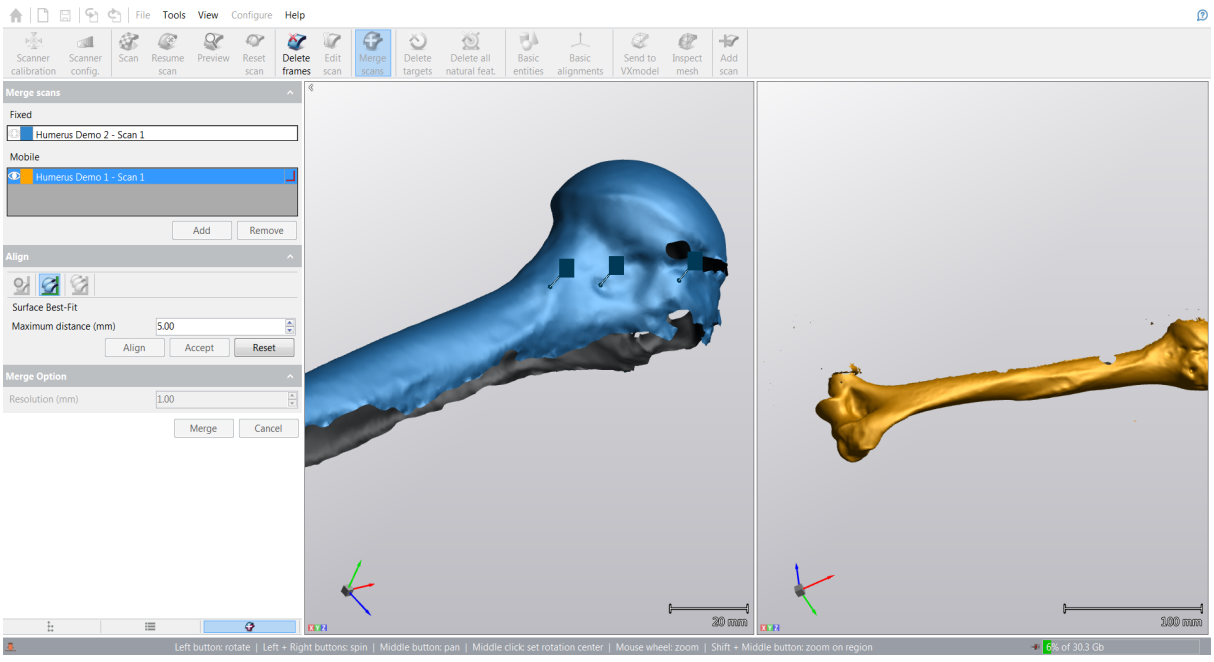
5. Another window will pop up next to the open window containing the scan data from **Humerus Demo 1.**

6. To merge the scans select distinguishing and unique natural features that appear in both scans. **Note:** The scan windows can be manipulated to optimize view to select the common features.

   For this example some of the natural features are shown below. The following point were selected on the **Fixed Model** (left). It is best to select various points that span the entire geometry of the bone scan.I n this example a total of five points were selected. **Note:** Not all selected points are shown.



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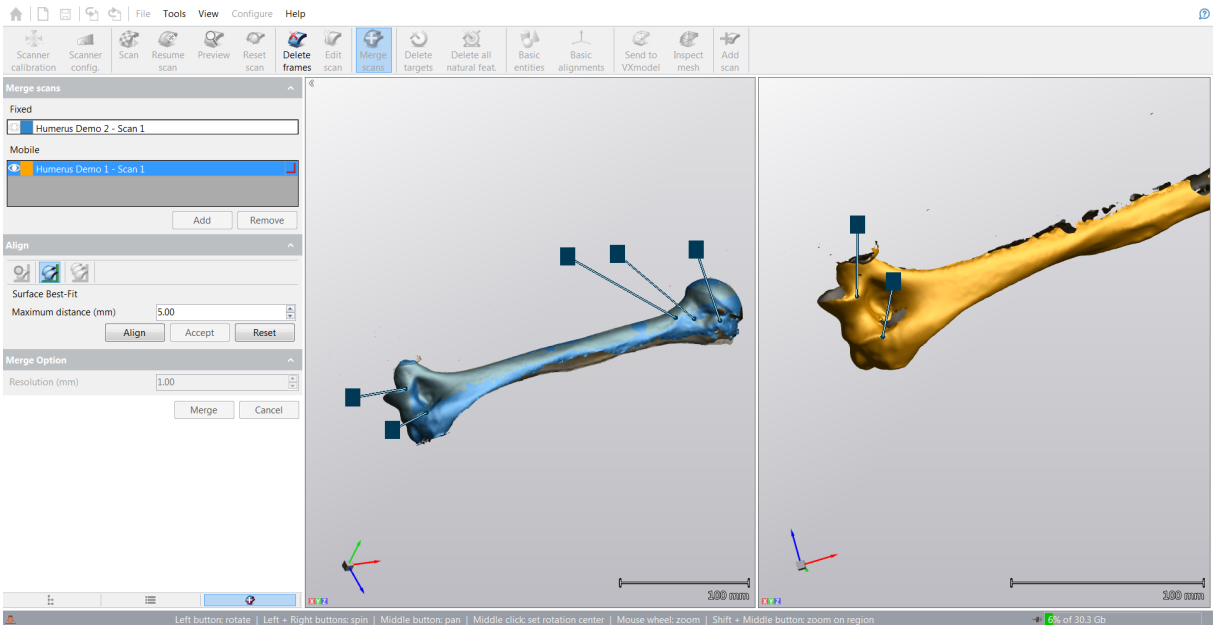
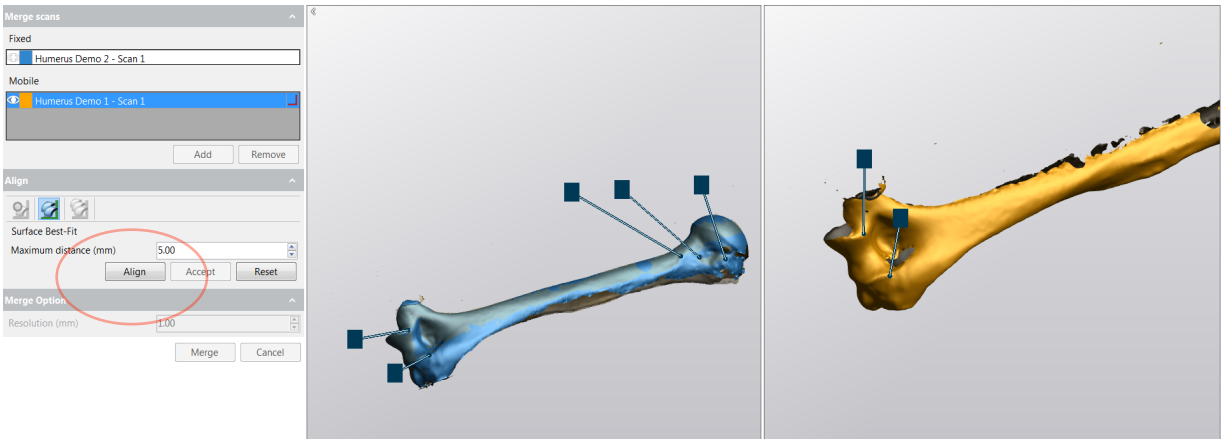
7. Next, select the same features points in the **Mobile Model** (right).Once the are points are selected, a phantom of the **Mobile Model** will appear imposed onto the **Fixed Model.**

   Check to see if the phantom of the **Mobile Model** matches the selected features and represents the original geometry of the scanned bone.

   Note: The order in which the points are selected play a role on the accuracy of the phantom. Select points in the **Mobile Model** in the same order you selected them in the **Fixed Model.** It is suggested to map and match each similar feature point individually on the fixed model and then the mobile model. This creates a more accurate superimposed phantom.



8. If you are happy with the alignment of the naturally selected features, click **Align** under **the Align** section of the **Merge Scans** task window. Then, click **Accept**.



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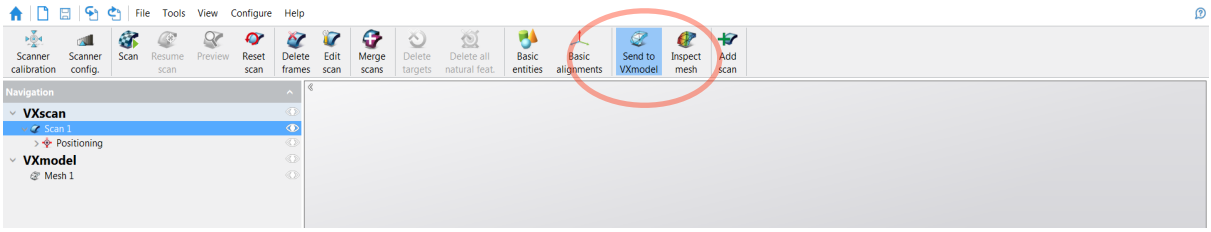
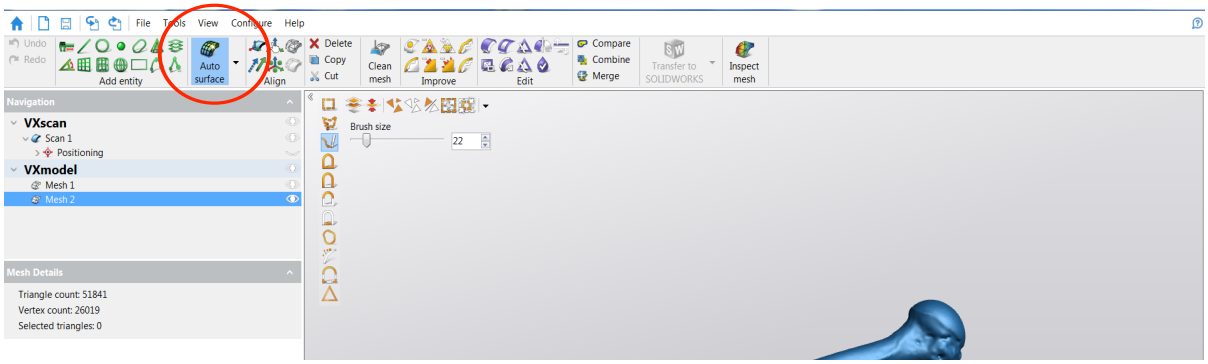
9. Finally, click **Merge** under the **Merge Option** section in the **Merge Scans** task window.

10. Voila! You have successfully generated a merged bone scan. Next, we will fill in any cosmetic deficiencies and export the merged scan as an .STL file for use in CAD or 3D Printing Software.

11. In the toolbar, select **Send to VX Model**. This software will translate the scan into a compilation of surfaces which can be read by CAD programs and 3D printers.



12. In the **VX Model** window select **Auto Surface,** located in the tool bar. This tool generates a mesh over the merged scan and fills in any minor discrepancies using interpolation.



13. Once the **Create Surface** task window pops up, select **Preview**. If you are happy with the preview of the surface, select **Create.** Your 3D scan has now been converted into a surface.

14. Lastly, to export your surface file into a format for 3D printing or CAD. Select **File>Export>Mesh** and choose **.stl** in the drop down menu for **Save as type.**

15. Congratulations. You have successfully transformed a 3D scan into something that can be 3D Printed or imported into Solidworks.

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