

Supplementary Materials

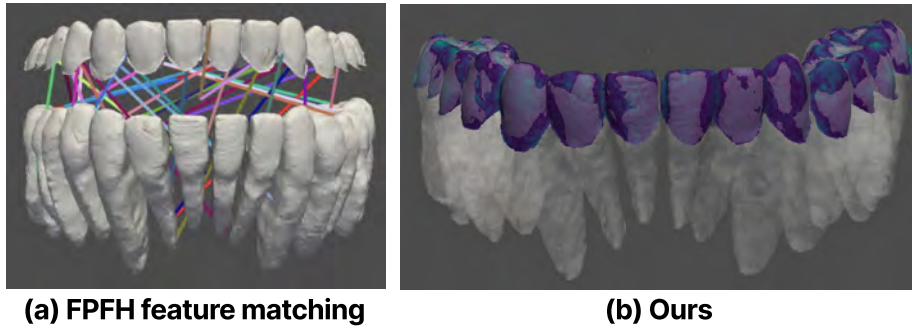


Fig. 1. (a) Registration by FPFH feature matching [?] which fails to achieve precise feature matching. The lines between meshes represent each matched FPFH feature between IOS and CBCT. A large number of IOS crowns are incorrectly matched with the CBCT counterparts. (b) Registration result from our method on the same patient.

Algorithm 1 Mesh Removal

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1: function MESHREMOVAL(IOS, CBCT, numTeeth,  $N, K, x$ )
2:   for  $i \leftarrow 1$  to numTeeth do
3:      $\text{IOS}_i \leftarrow$  Boundary PCD of IOS tooth number  $i$ 
4:      $\text{IOS}_i \leftarrow$  Aligning  $\text{IOS}_i$  in one direction
5:      $\text{CBCT}_i \leftarrow$  Nearest point of CBCT matched to each point in  $\text{IOS}_i$ 
6:     for  $p \leftarrow 0$  to len( $\text{CBCT}_i$ ) do
7:        $\text{CBCT}_i^p \leftarrow$  each PCD of  $\text{CBCT}_i$ 
8:       if  $p ==$  len( $\text{CBCT}_i$ ) then
9:          $\text{PointsInPath} \leftarrow$  Dijkstra( $\text{CBCT}_i^p, \text{CBCT}_i^0$ )  $\triangleright$  Return all points on
the shortest path between  $\text{CBCT}_i^p, \text{CBCT}_i^0$ 
10:      else
11:         $\text{PointsInPath} \leftarrow$  Dijkstra( $\text{CBCT}_i^p, \text{CBCT}_i^{p+1}$ )
12:         $\text{CBCT}_i \leftarrow$  REMOVE( $\text{CBCT}_i, \text{PointsInPath}$ )  $\triangleright$  Remove points in  $\text{CBCT}_i$ 
13:         $\text{LargestCBCT}_i \leftarrow$  LARGEST( $\text{CBCT}_i$ )  $\triangleright$  Removing points may split the
mesh into multiple segments; the largest segment is most likely the root section.
14:   return array of  $\text{LargestCBCT}_i$ 

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