

DENTAL INTERVENTION DETECTION

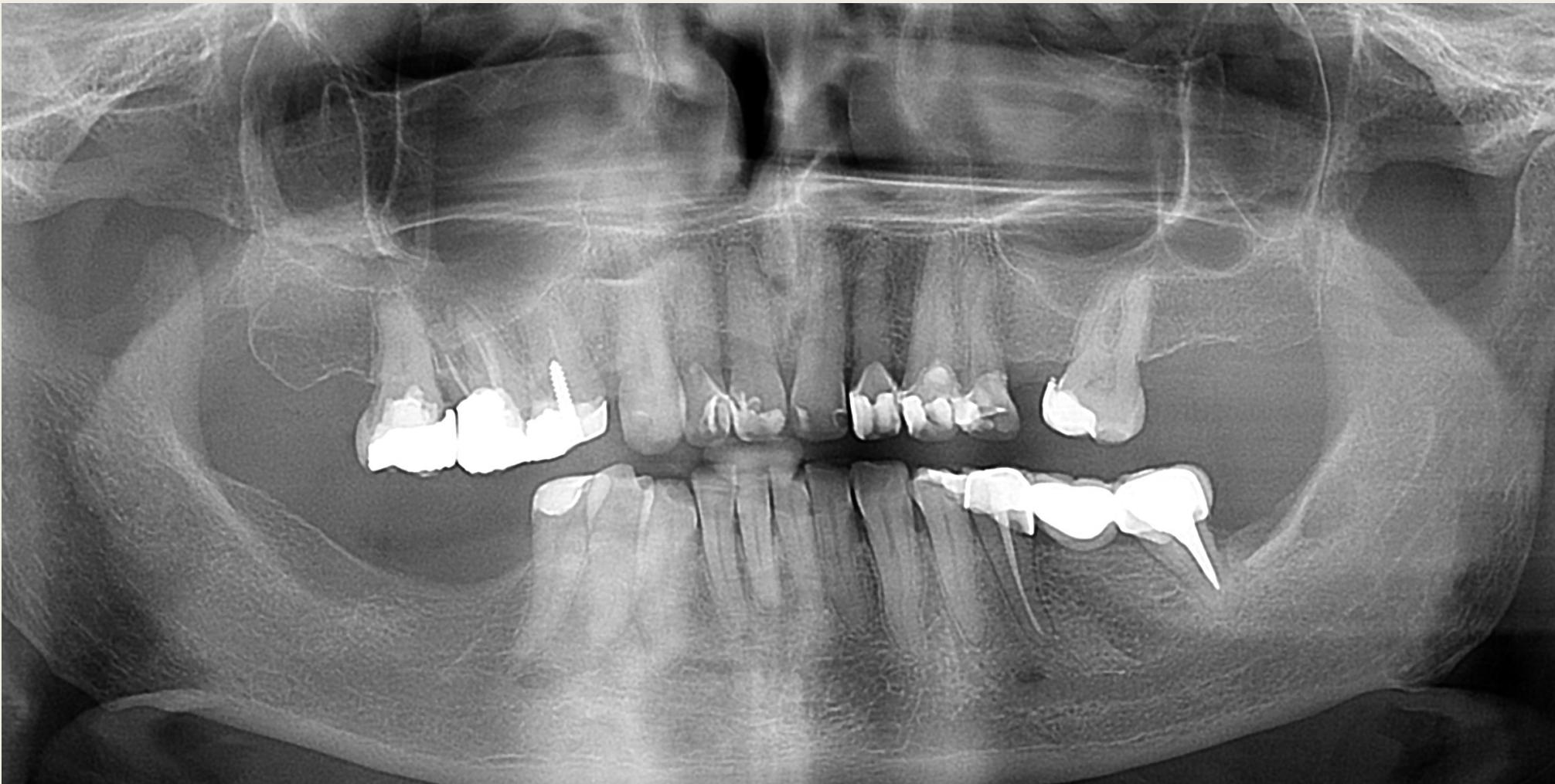
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Mentor: Marko Subašić

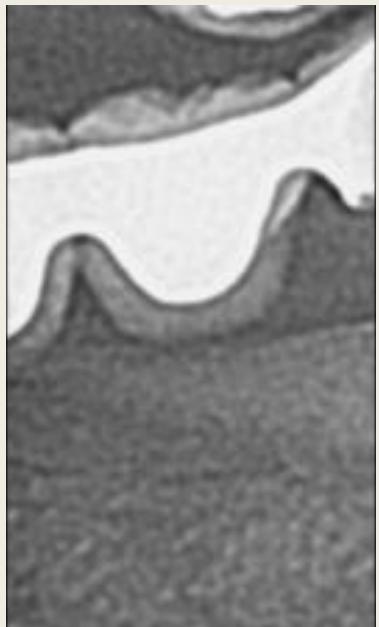
Course: Seminar 2

2021./22.

Motivation



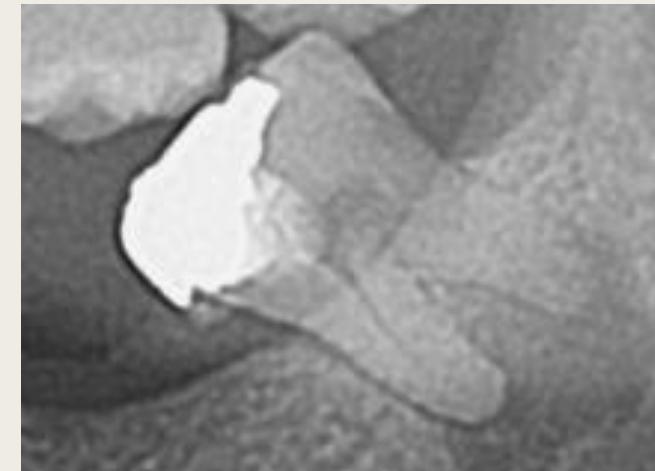
Types of Tooth Intervention



Bridge - 1



Endofilling - 2



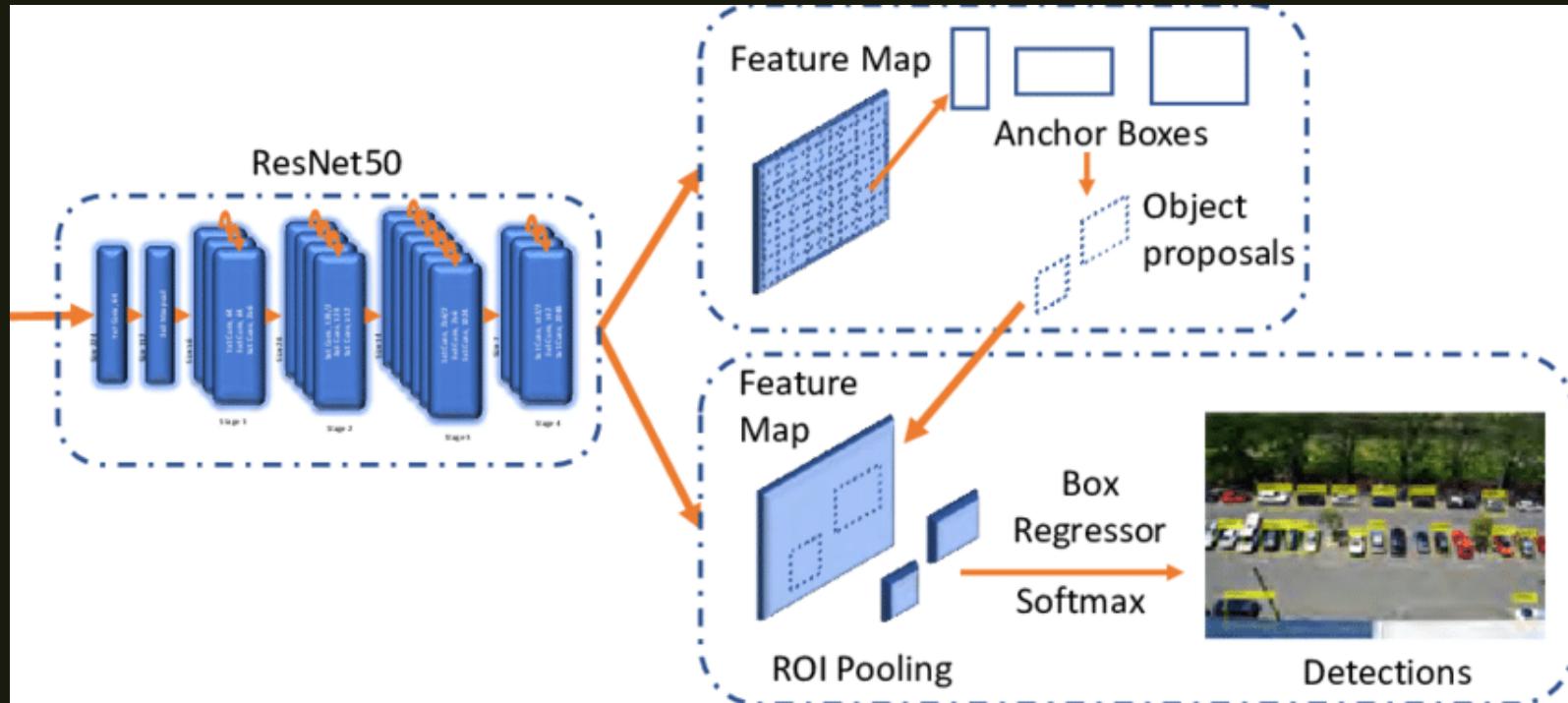
Filling - 3



Crown - 4

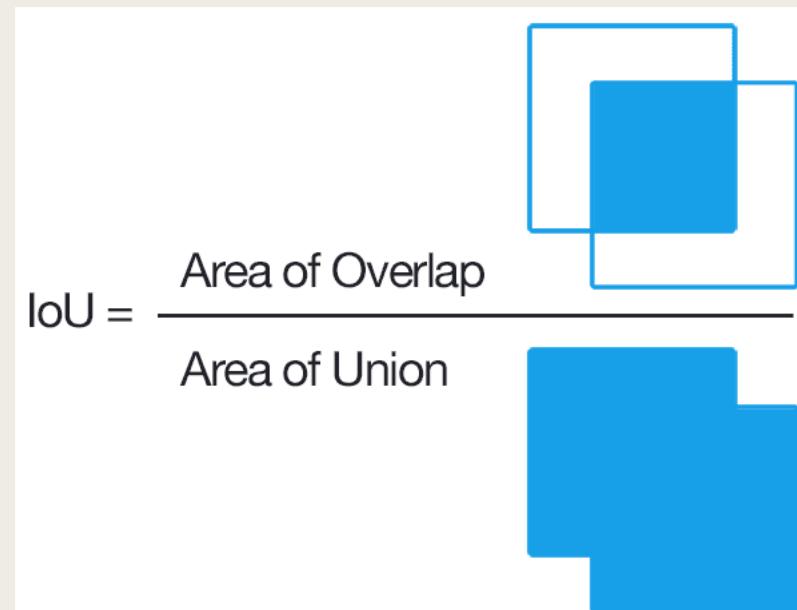
Approach

- Faster RCNN
- Transfer Learning
- ResNet50

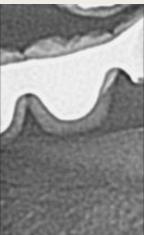


Results – First Attempt

- Bridge: (AP)@[IoU=0.50:0.50] = 0.602
- Endofilling: (AP)@[IoU=0.50:0.50] = 0.955
- Filling: (AP)@[IoU=0.50:0.50] = 0.803
- Crown: (AP)@[IoU=0.50:0.50] = 0.668

$$\text{IoU} = \frac{\text{Area of Overlap}}{\text{Area of Union}}$$


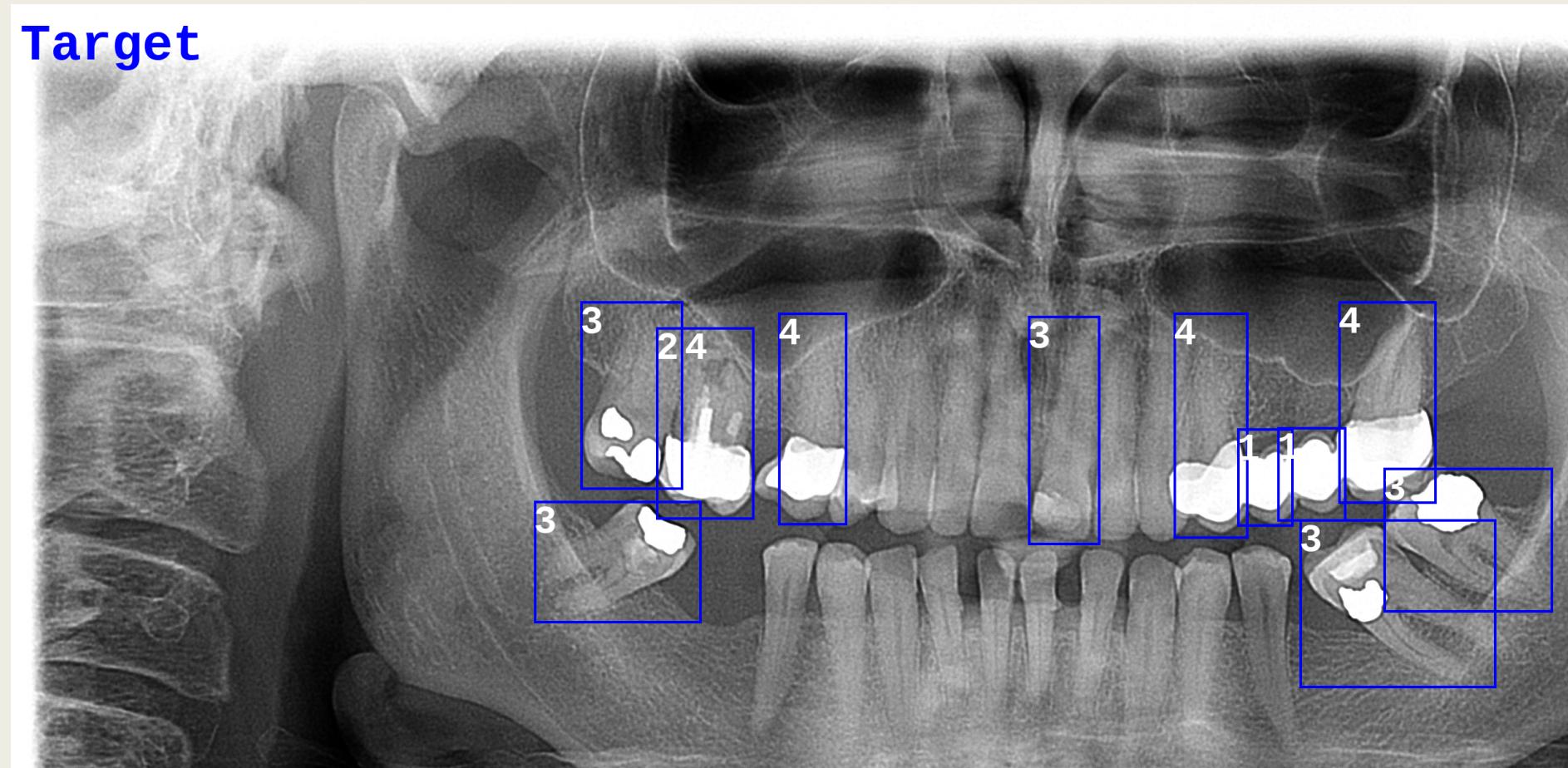
Legend:



Results – First Attempt

(Target)

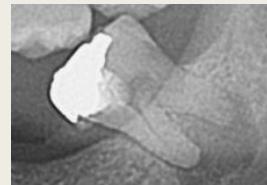
Target



Bridge - 1



Endofilling - 2

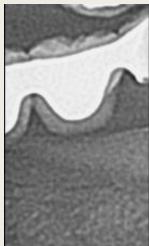


Filling - 3



Crown - 4

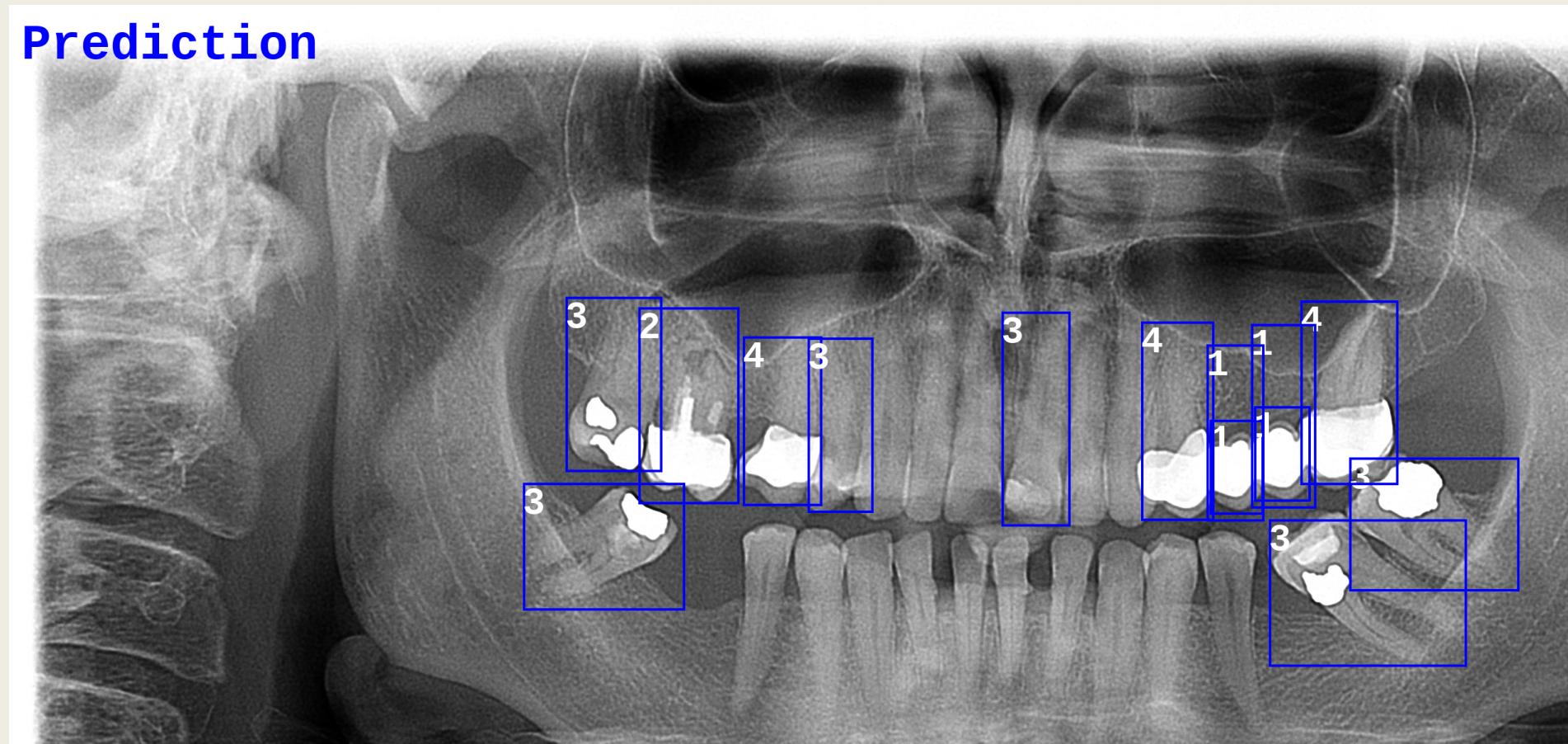
Legend:



Results - First Attempt

(Prediction)

Prediction



Bridge - 1



Endofilling - 2



Filling - 3

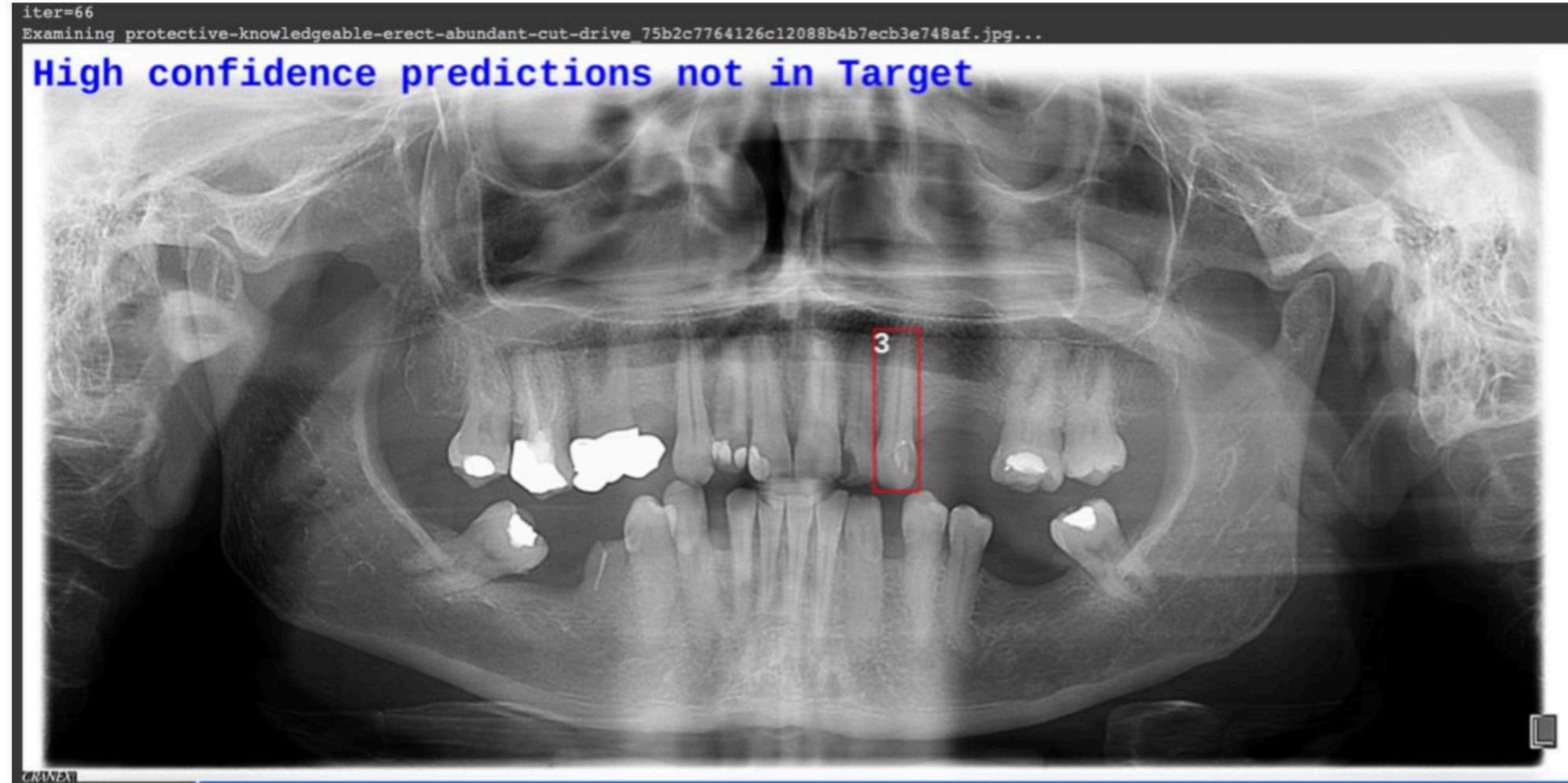


Crown - 4

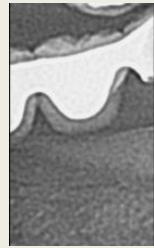
Consultation with Stomatologists

Legenda:

Ima li crveno označen zub 'filling'? :_DA – ali je riječ o privremenom ispunu, ako smo pod



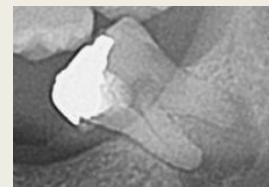
filling ubrajali samo trajne ispune onda je NE _____



Bridge - 1



Endofilling - 2



Filling - 3



Crown - 4

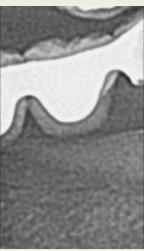
Consultation with Stomatologists

Legend:

Ima li crveno označen zub endofilling?: DA

Examining foregoing-bright-exuberant-bored-married-patient_ab2595c380546b40d407f820bb49c8bd.jpg...

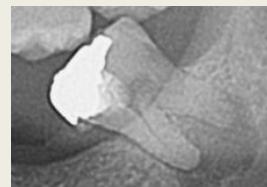
High confidence predictions not in Target



Bridge - 1



Endofilling - 2



Filling - 3



Crown - 4

CRANEX
decision(1 / 0): 1

Semi-automated Label Correction

Legend:

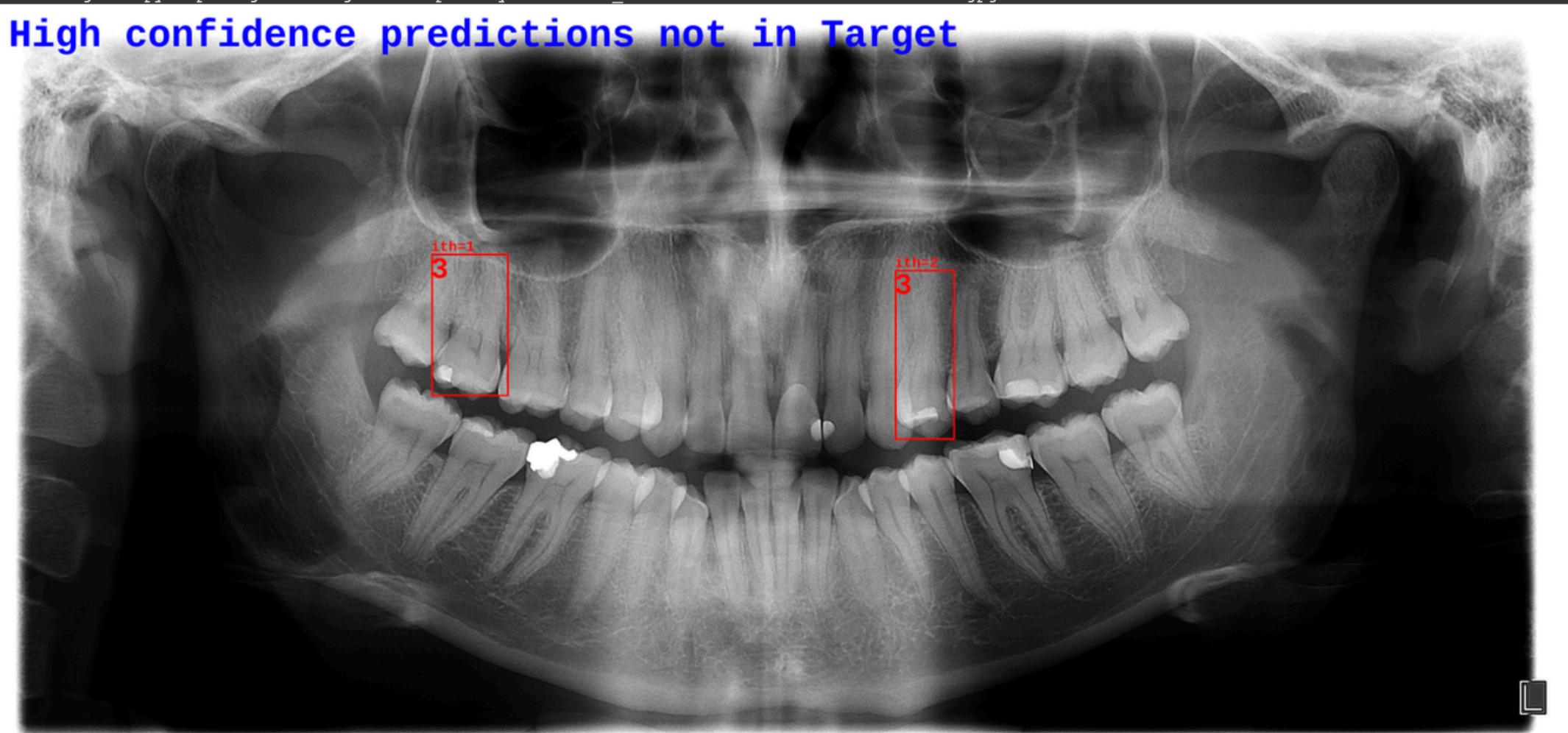
Welcome to the data correction approval process!

After each case you will be asked whether to approve or reject the data correction

1 => approve, 0 => reject, exit, or any other string => terminate the approval process

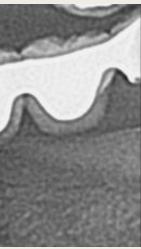
Examining sleepy-aspiring-shocking-nimble-prickly-selection_b9b5cf8f66cca9e6f2f82fab143faa6.jpg...

High confidence predictions not in Target



CRANEXTM
decision(1 / 0 / S*): 1

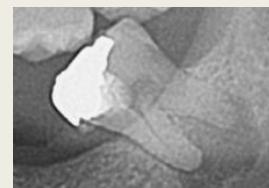
For f_1_7 filling was set to no, setting it to 'yes'...



Bridge - 1



Endofilling - 2



Filling - 3



Crown - 4

Results – second attempt

- Bridge: (AP)@[IoU=0.50:0.50] = 0.640
 - Endofilling: (AP)@[IoU=0.50:0.50] = 0.975
 - Filling: (AP)@[IoU=0.50:0.50] = 0.839
 - Crown: (AP)@[IoU=0.50:0.50] = 0.655
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- Bridge: (AP)@[IoU=0.30:0.30] = 0.827
 - Endofilling: (AP)@[IoU=0.30:0.30] = 0.977
 - Filling: (AP)@[IoU=0.30:0.30] = 0.841
 - Crown: (AP)@[IoU=0.30:0.30] = 0.667