

SUPPLEMENTARY MATERIAL 3

The Detail of Judgment Criteria of CNN Model

In this study, ground truth (GT) included the category of rib fracture and true bounding box; IoU was the ratio of intersection and union of the predicted box and GT box, defined as:

$$\text{IoU} = \frac{\text{area} | B_p \cap B_{gt} |}{\text{area} | B_p \cup B_{gt} |}$$

where B_p is the predicted box and B_{gt} is the GT box. IoU was used to indicate the confidence regarding fractures in the predicted box. In the current study, the IoU threshold was 0.3. $\text{IoU} > 0.3$ indicated that the predicted box contained fractures (positive), otherwise it had no fractures (negative). In order to remove redundant predicted boxes, non-maximum suppression was used to preserve the predicted boxes with the highest score (1).

REFERENCE

1. Neubeck A, Van Gool L. *Efficient non-maximum suppression*. 18th international conference on Pattern Recognition (ICPR '06);2006 August 20-24;Hong Kong