



6FDOH, QYDULDQW)XOO\ &RQYROXWLRQ
'HWHFWLQJ +DQGV (IILFLHQWO\

Hi)Wj P00# 5tJñŠ !-&Ë TòOCó 6LZHL/\X

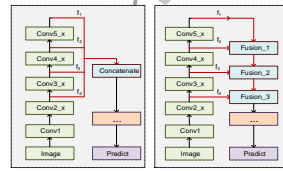
J-0 -L'W- J- 4i4Ö 0ùW -•D\$!6Q 5%-

a7-Eÿ &.D0!;ó Èj-0 -L'Eÿ &.D0! p J- 7@AR R X!W'XÓ J-

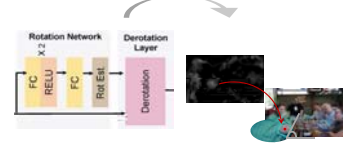
L NÈ Q x, ' ê { ð# {
Ä+X <Š)à! Ä ê j Ô Ä ÄP@P!- x1y

øj

CQ)^



6LPXOWDQHRXVO\WHUDWLYHO\ <DQ HW DO 2XUV



'HURWDWLRQ DOG 5RWDSR WFDQWLRO\ WDS 'HQJ HW DO 2XUV

j Ö = , ' ~ §0 /Z4y5•5

2. © ±=½ 8

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¼ ÄCWf Ä) f)(© ± . È > | È s Ö

J % Qè) 5 L s F % H K Qè R) 5 ä

¼ 6 :M' Ç ; ' Tr, '(© ± . XFJf5\$ Ö :F >|F Ö

¼ 4yÈ÷ s H§0 ÿ AEÄ *FJf

¼ 4yÈ÷ u H§0 =½ 8 = < rIQ, '(© ±

¼ =½ 8 >, '(© ± . CE j ; 0 Z =½ 8 Q † Ä UF FCWF Ä

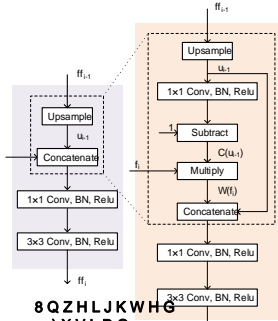
' * \ (© ± . F > | ; 0 * , F =½ 8

3. EÄ *

¼ EÄ * 5 9G 6 Ö Ç 6 . È @ Ö . ¼ D / è . È 6 [Aä

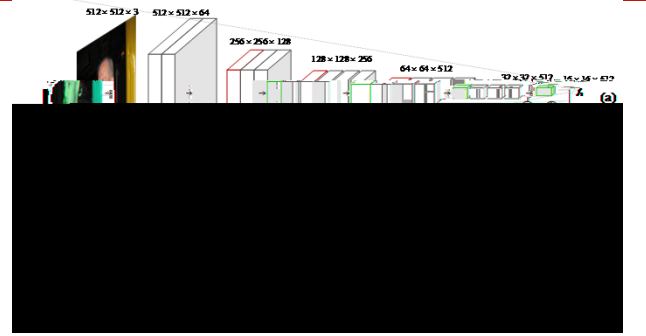
...N#{ } » j , ' 5z Ö Ä û Ece @ Ö ¼ ... ÿ Ä

$$\frac{5}{5} \cdot 6 \cdot \left(\frac{5}{7}\right)^6$$



8QZHLJKWHG

&RPSOHPHQWDLU :HLJKWHG



9 * * j P 0 e 5 + , ' 6 ,) & 5 5 ' Ä k ? 5 [9 G 6 D ± G 6 È © ± =½ 8 G 6 ¼ FEÄ * G 6

4. JjÖ • a-

L 38 D 3 8 Ü 88 E Ü E ») ä 5 L < s ä t á u ä v =

‡ V WKH FXUUHQW VFDOH
‡ B WKH FXUUHQW VFDOH IHDWXUH P D S G L E A G C
‡ 9 (B) WKH ZHLJKWHG IHDWXUH P D S V L S F . è F : ä ; ä
‡ % Qè) 5 WKH FRPSOHPHQWDLU IHDWXUH P D S V L S F : è F : ä ; ä
‡ Ü HOHPHQW ZLHV PXOWLSOLFDFWLRQ L F Z : è F : ä ; ä

ÏP¼

¼ 9 , 9 \$ è { ZLÖ (Das, OhnBar, and Trivedi 2015)

¼ Train: 5,500 images Test: 5,500 images

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¼ 7 # j E r U E , E é + | v

Table 1: Results on VIVA Dataset.

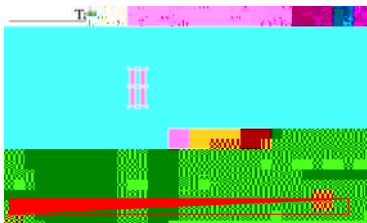
Methods	Level-1(AP/AR)/%	Level-2(AP/AR)/%	Speed/fps	Environment
MS-RFCN (Le et al. 2017)	88.12/5.5	89.0/83.4	4.85	6 cores@ 5.5GHz, 32GB RAM, Titan X GPU
MS-RFCN (Le et al. 2016)	91.25/1.1	86.9/77.3	4.85	6 cores@ 5.5GHz, 32GB RAM, Titan X GPU
Multi-scale fast RCNN (Yan et al. 2017)	92.8/82.8	84.7/66.5	3.31	6 cores@ 5.5GHz, 64GB RAM, Titan X GPU
FRCSN (Zhou, Pillai, and Yalla 2016)	90.7/55.9	86.5/53.3	-	-
YOLO (Redmon et al. 2016)	76.4/46.0	69.5/39.1	35.00	6 cores@ 5.5GHz, 16GB RAM, Titan X GPU

¼ 2 | I R U G è { ZLÖ (Lital, Zisserman, and Torr 2011)

¼ Train: 2,250 images Test: 436 images

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