05_CVF_413 Marvin Kind, Konstantin Nauwerther, Max Kohl

① Hough Transform

a) choose two points from (ρ,θ)-plane: to determine A in x_{1y}-plane ~~only~~ origin

$$(1,0)\big|^{A}_{\rho,\theta} \Longrightarrow x_A = 1$$
$$(3,\tfrac{\pi}{2})\big|^{A}_{\rho,\theta} \Longrightarrow y_A = 3$$
$$\Rightarrow \boxed{A=(1,3)\big|_{x_{1y}} \longrightarrow B=(-1,1)\big|_{x_{1y}}}$$

b) From $B=(-1,1)\big|_{x_{1y}} \Longrightarrow \left\{ (-1,0)\big|^{B}_{\rho,\theta},\ (1,\tfrac{\pi}{2})\big|^{B}_{\rho,\theta} \right\} \stackrel{!}{=}$ points described by sinus-curve of B in (ρ,θ)-plane

general sinusoidal curve with parameters A, B: $\rho = A\sin(\theta) + B$

$(-1,0) \Longrightarrow -1 = A\sin(0) + B \Rightarrow B = -1$ $\quad (1,\tfrac{\pi}{2}) \Longrightarrow 1 = A\sin(\tfrac{\pi}{2}) - 1 \Rightarrow A = 2$

$$\Longrightarrow \boxed{\rho_B(\theta) = 2\sin(\theta) - 1}$$

The point of intersection is given by the straight line through A and B defined by $y = x + 2$.

② Read a recent paper about image segmentation

Choice: 1. Xiong, Yuwen, et. al. "UPSNET: A unified panoptic segmentation network"

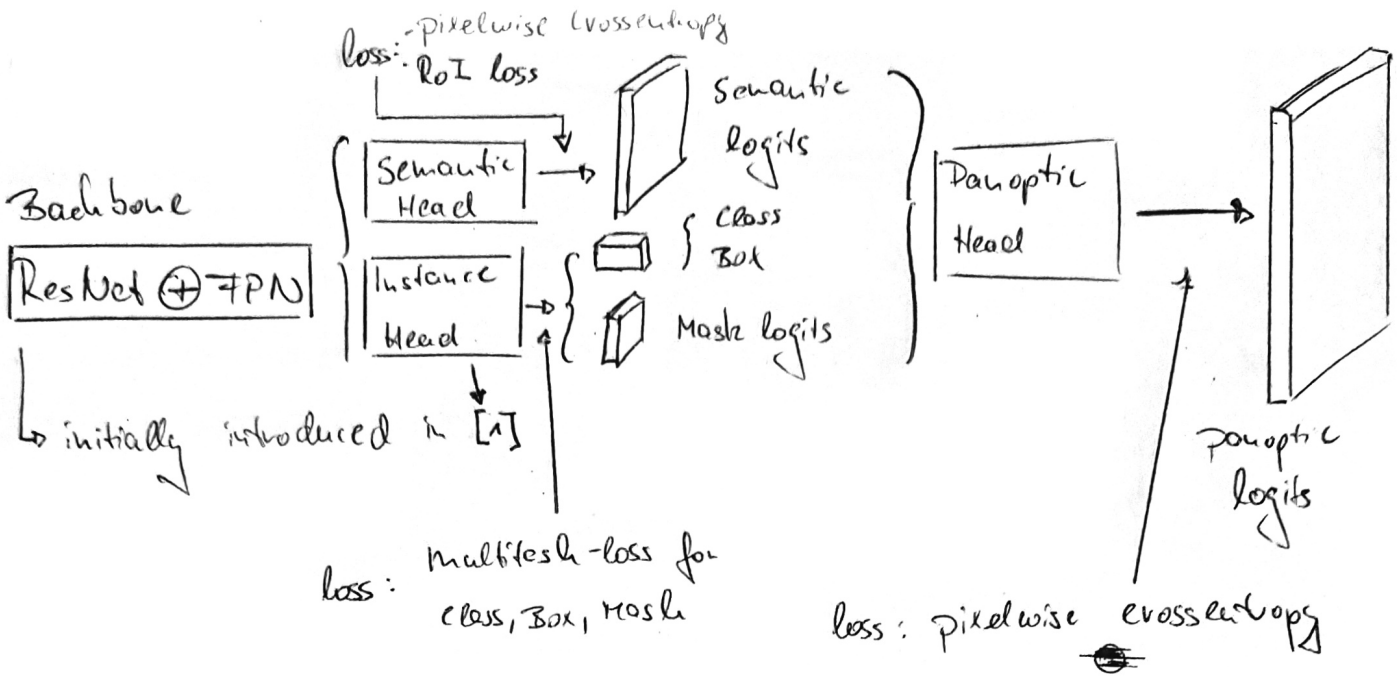
a) According to Google Scholare cited by 61

b) Rank 15 in Instance-Level Semantic Labeling Task (*)

c) Top-down approach, because it combines semantic segmentation and instance segmentation by letting the latter be performed by a Mask-R-CNN having classes, masks and bounding boxes as output.

(*) Presented the first time CVPR 2019

d)



e)

- Anchor boxes predicted? Yes
- Instance mask predicted for each proposal? Yes
- Object proposal method also from [1]

[1] ~~K. He, X. Zhang, S. Ren~~ K. He, G. Gkioxari, P. Dollár and R. Girshick "Mask R-CNN" ICCV, 2017