

3rd week CV study

Speaker: 류창훈

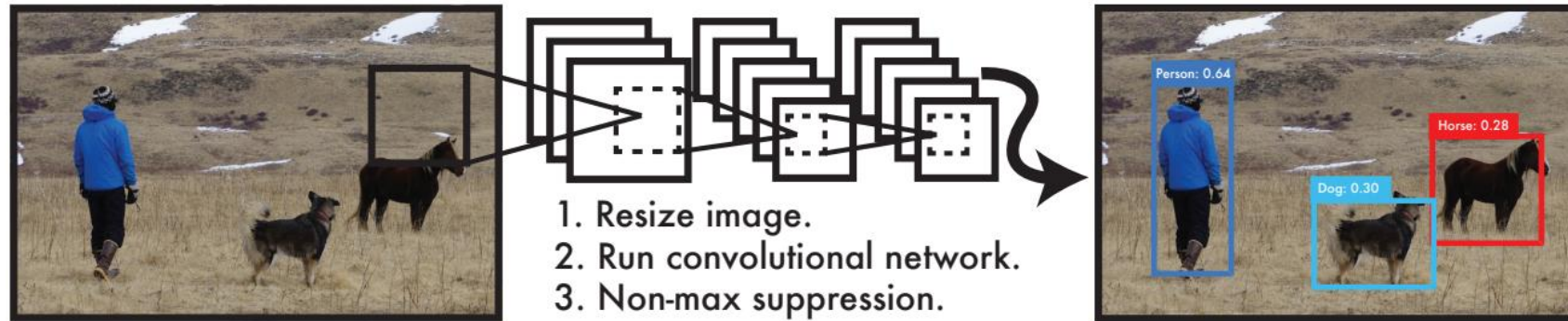


AI명예학회

SKHU

YOLO

Object detection 분야에서 매우 유명

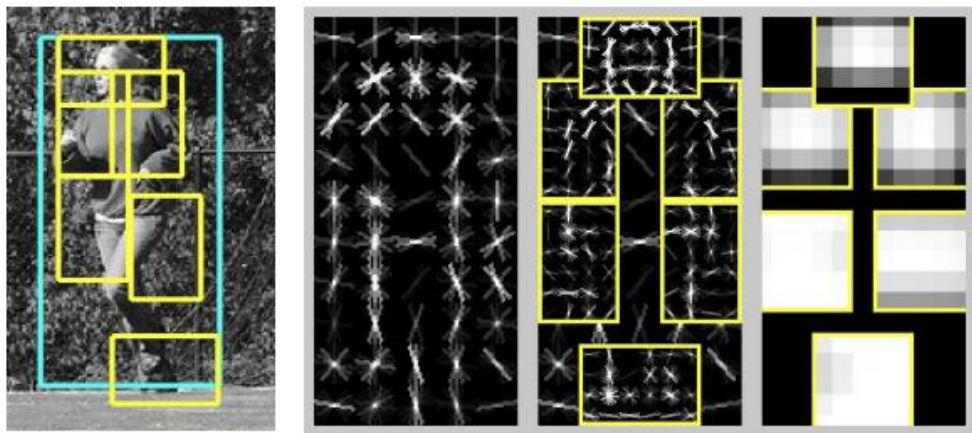


위에 처럼 bounding box 를 침.

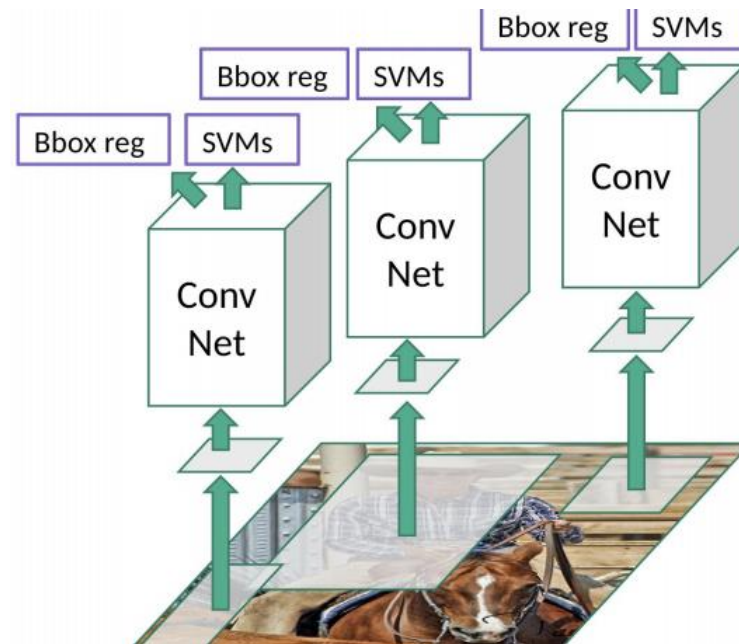
대신, 공간분리 느낌.

각각 결국엔 합치고,

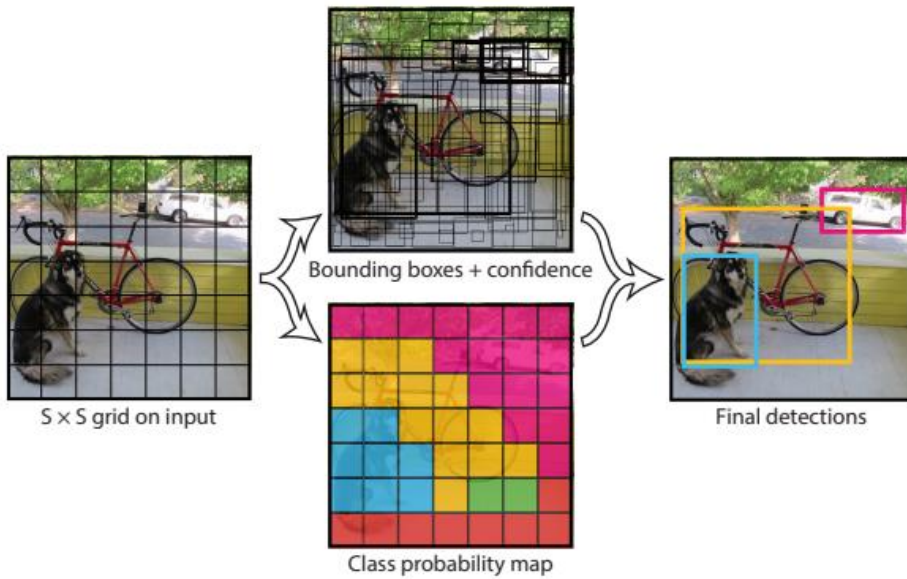
Regression으로 접근.



DPM



R-CNN



input 이미지 grid 단위로 쪼갬

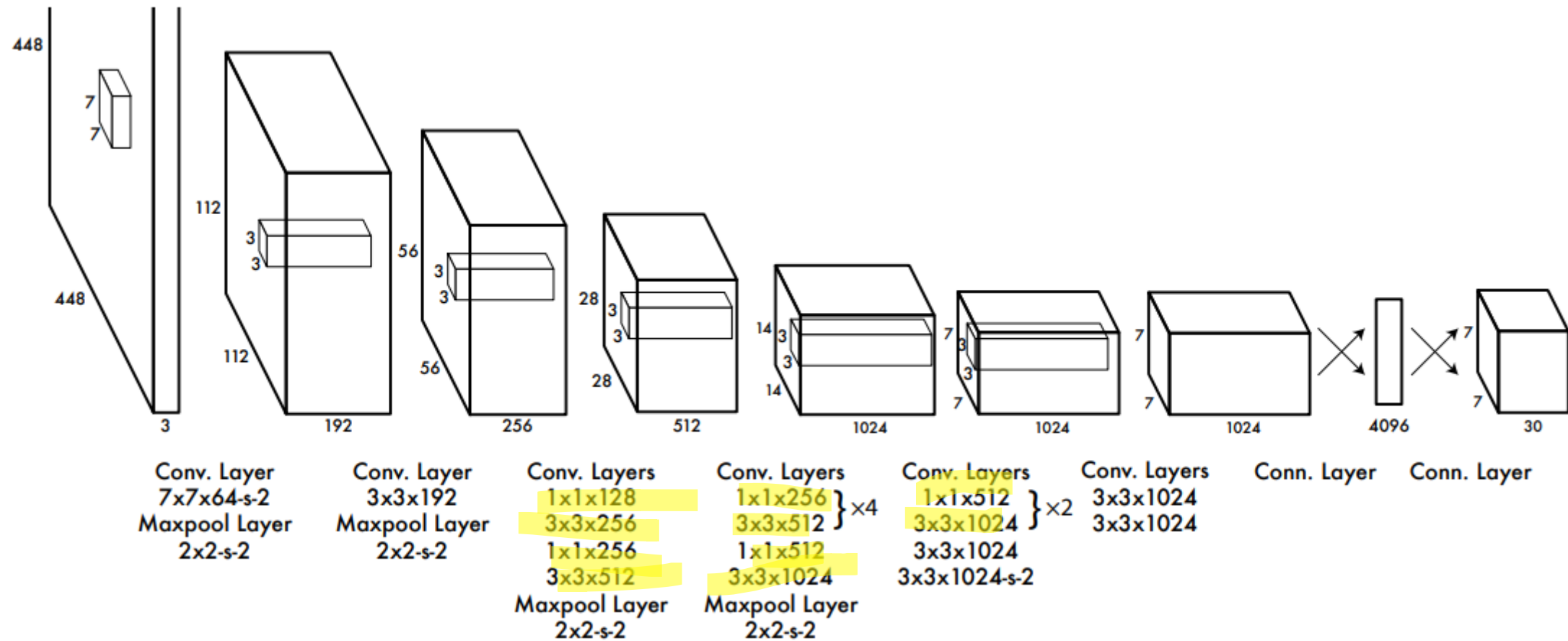
각 grid 들은 bounding box & 이 박스의 신뢰도 점수 보유.

$$\Pr(\text{Class}_i | \text{Object}) * \Pr(\text{Object}) * \text{IOU}_{\text{pred}}^{\text{truth}} = \Pr(\text{Class}_i) * \text{IOU}_{\text{pred}}^{\text{truth}} \quad (1)$$

ImageNet 1000-class competition dataset 학습.

계층은 GoogLeNet 살짝 따옴.

**인셉션 모듈 말고, 1x1 계층(reduction layer) 뒤에
3x3 conv 계층 단순 연결.**



Loss function

$$\begin{aligned} & \lambda_{\text{coord}} \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{obj}} \left[(x_i - \hat{x}_i)^2 + (y_i - \hat{y}_i)^2 \right] \\ & + \lambda_{\text{coord}} \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{obj}} \left[\left(\sqrt{w_i} - \sqrt{\hat{w}_i} \right)^2 + \left(\sqrt{h_i} - \sqrt{\hat{h}_i} \right)^2 \right] \\ & + \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{obj}} (C_i - \hat{C}_i)^2 \\ & + \lambda_{\text{noobj}} \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{noobj}} (C_i - \hat{C}_i)^2 \\ & + \sum_{i=0}^{S^2} \mathbb{1}_i^{\text{obj}} \sum_{c \in \text{classes}} (p_i(c) - \hat{p}_i(c))^2 \quad (3) \end{aligned}$$