Computer Vison

2024 - 07 - 28

Computer Vision?

- Scientific field that extracts information out of digital images.
- (Spcae, Navigation, reality application)
- perform visual perception tasks from image or videos simillar to human vision

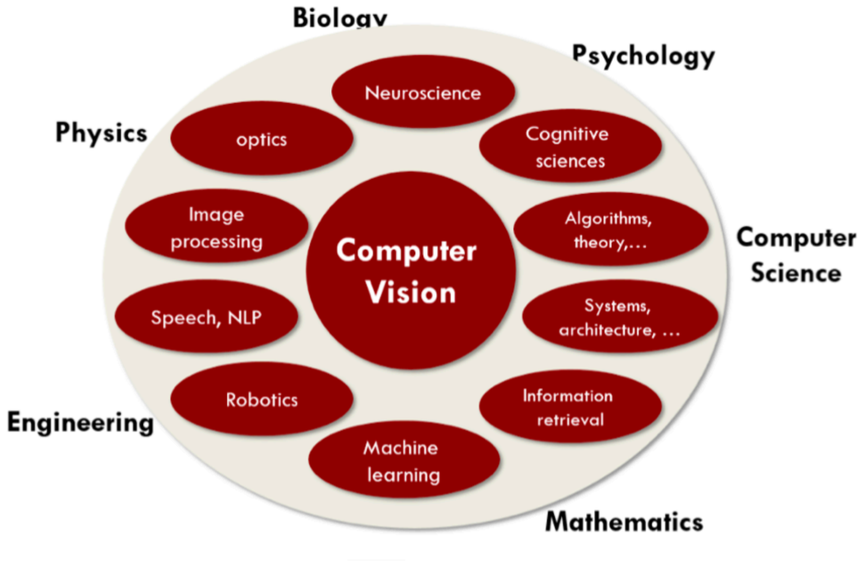


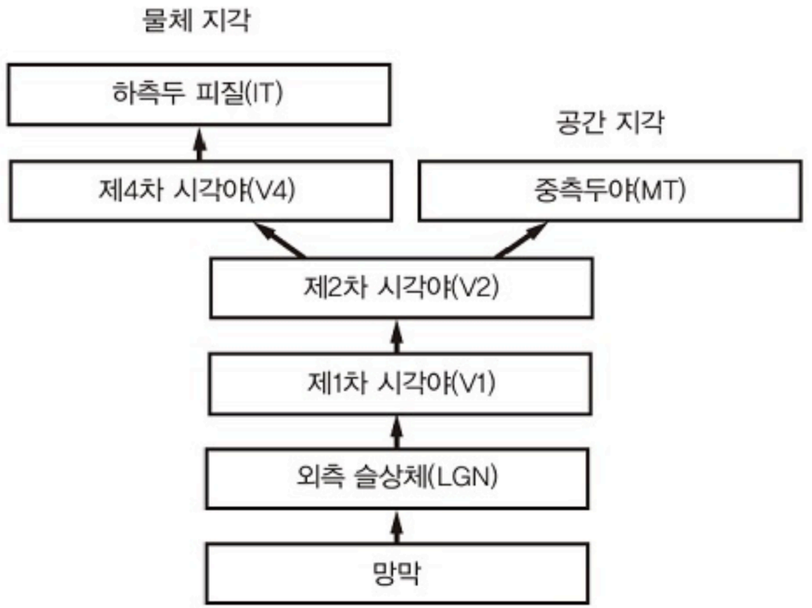
Figure 1: Computer vision at the intersection of multiple scientific fields

Understanding Computer Vision

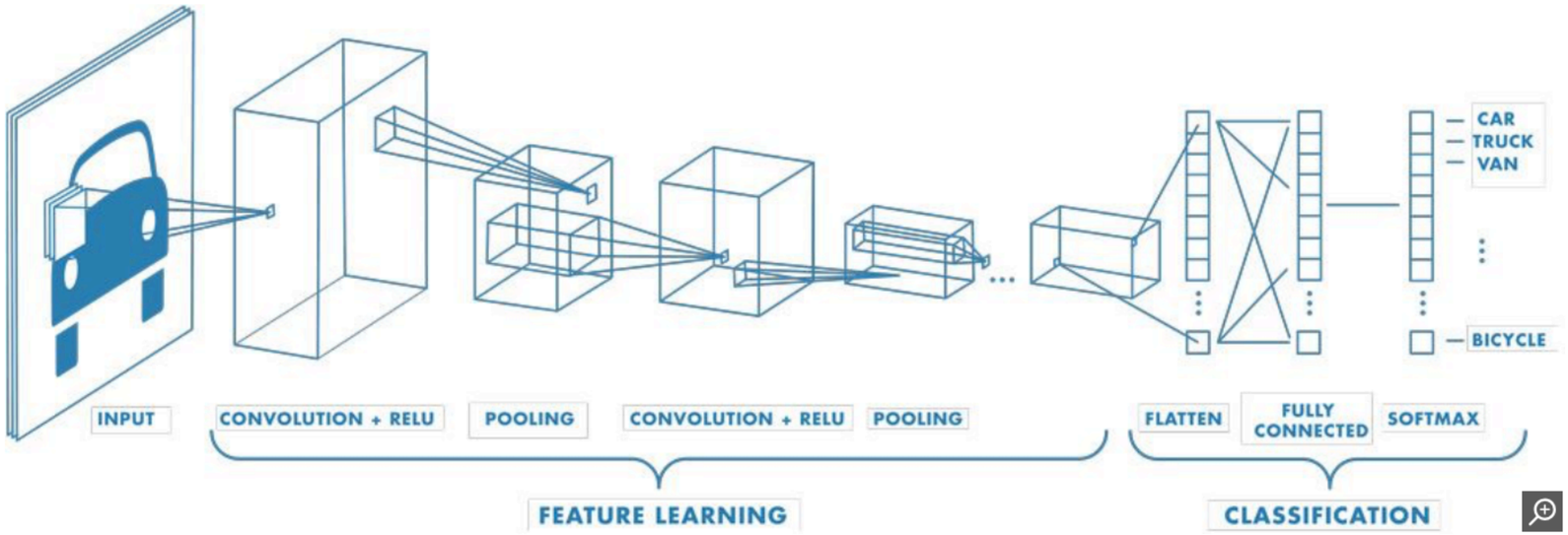
- computer science
- algorithm
- machine learning
- computer vision algorithm

Why use DeepLearning?

- 200 x 200 RGB image = 120,000 Data
- sensing device
- interpreting device
- CNN = V1



CNN


CAR
TRUCK
VAN
BICYCLE
INPUT
CONVOLUTION + RELU
POOLING
CONVOLUTION + RELU
POOLING
FLATTEN
FULLY CONNECTED
SOFTMAX
FEATURE LEARNING
CLASSIFICATION

PlaneRCNN

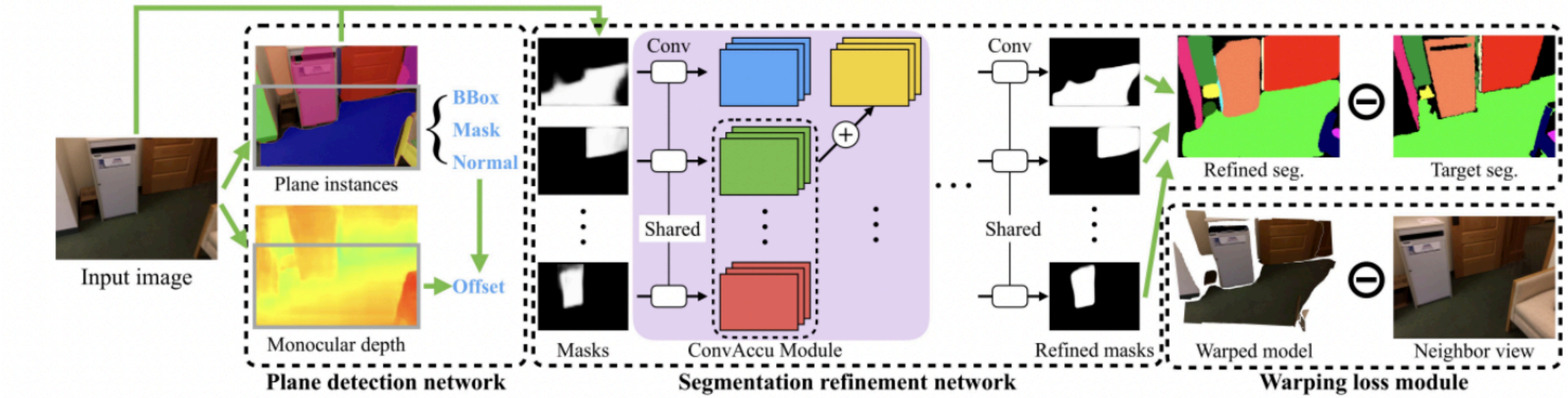
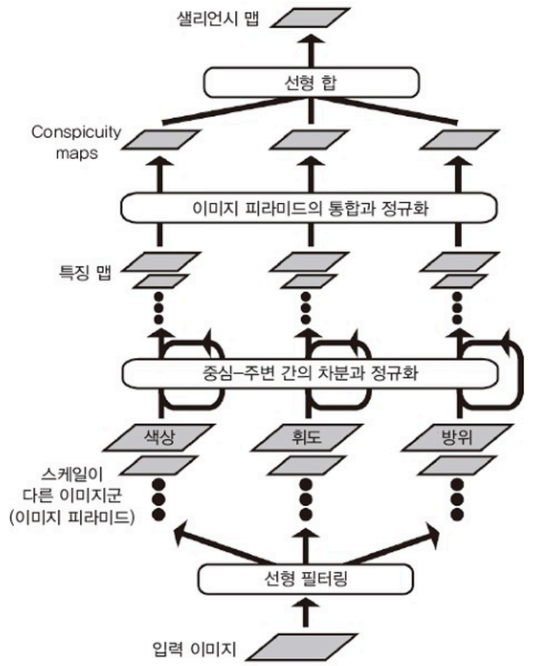


Figure 2. Our framework consists of three building blocks: 1) a plane detection network based on Mask R-CNN [14], 2) a segmentation refinement network that jointly optimizes extracted segmentation masks, and 3) a warping loss module that enforces the consistency of reconstructions with a nearby view during training.

Why use DeepLearning?

- itti-Koach
- GBVS
- DeepLearning (DeepLab, PoseNet..)



Learning?

Perception -> Recognition -> Change DFX

Train (X) -> Validate (Y) -> Change F(x)

Linear Regression

- Linear Function
- Loss Function (MSE)
- Update Gradient
- Update