Person Re-identification using CUHK03

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CSE4019 - Image Processing
J Component
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Object Detection

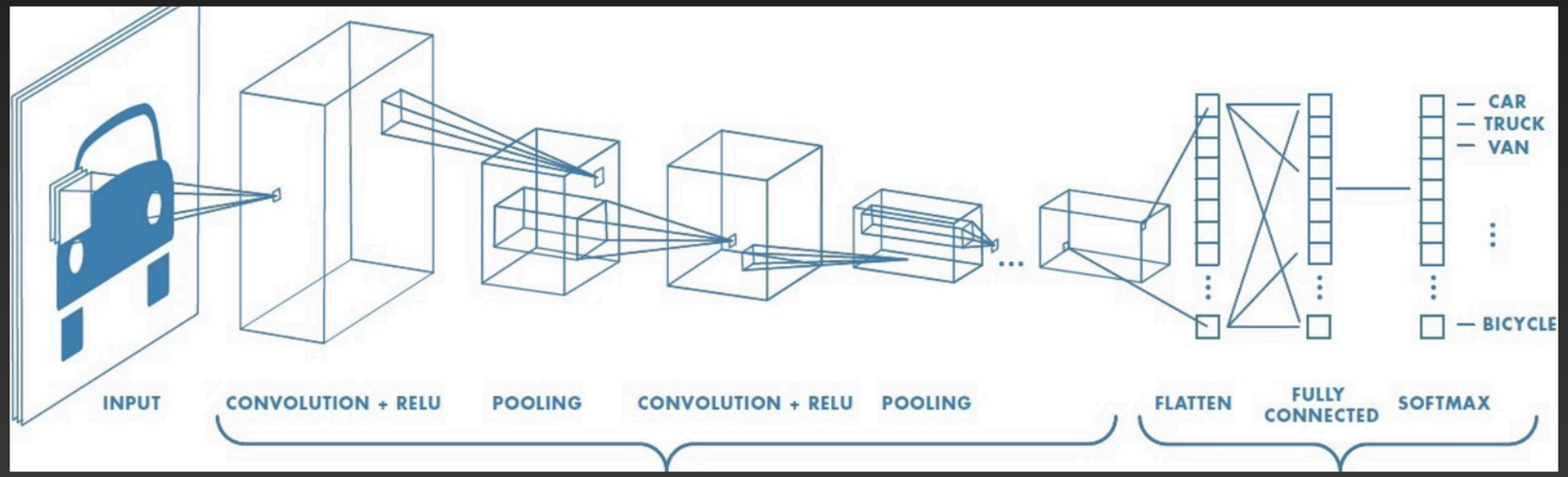
- Object detection is a computer technology related to computer vision and image processing that deals with detecting instances of semantic objects of a certain class (such as humans, buildings, or cars) in digital images and videos.
- In our case the object to be detected and labelled/identified is a person.
- This can be done with a efficient architecture of a Convolution Neural Network.

Person Re-Identification as an Application

- Image re-identification with multiple cameras has been a major area of interest in the past 7-8 years.
- Network of Cameras - Different Angles - Same Geographical area and purpose
- Surveillance and Security - Primary Beneficiaries

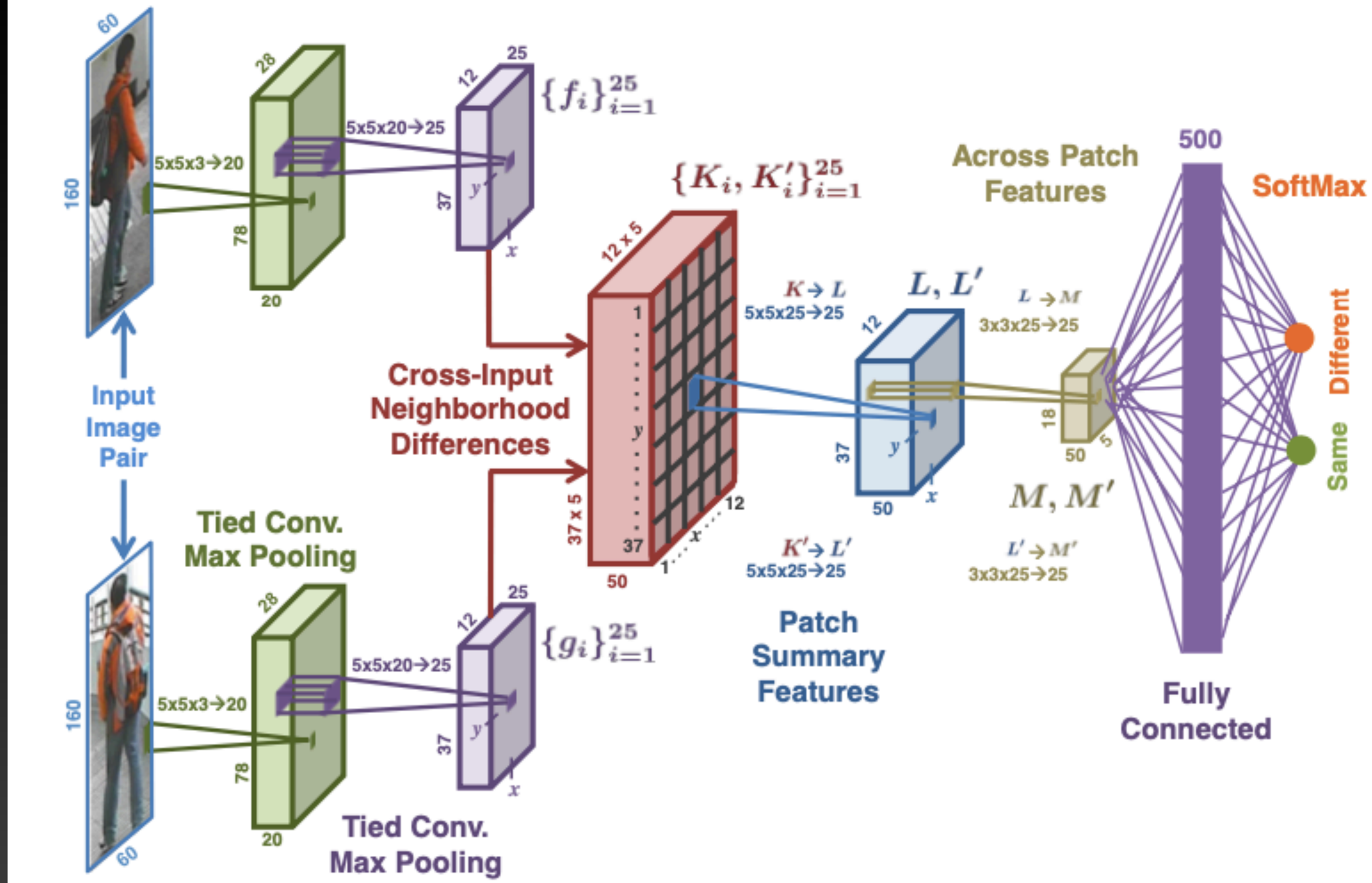
Convolution Neural Networks

- Neural Nets revolutionised the computer vision field.
- Objects/People - defining features - help identification
- Highlighted using an appropriate filter
- ML - best filter/kernal - correct features - improve image identification.
- Architecture



CUHK03

- Chinese University of Honk Kong
- CUHK03 is the first person re-identification dataset that is large enough for deep learning.
- **CUHK03 - 1,360 identities, 13,164 images, manually cropped + automatically detected**
- It provides the bounding boxes detected from DPM and manually labelling.
- 2014
- CUHK01 - 971 identities, 3884 images, manually cropped - 2012
- CUHK02 - 1816 identities, 7264 images, manually cropped - 2013


60
160
28
78
20
5x5x3→20
5x5x20→25
12
25
37
$\{f_i\}_{i=1}^{25}$
Input Image Pair
Cross-Input Neighborhood Differences
$\{K_i, K_i'\}_{i=1}^{25}$
12 x 5
37 x 5
50
$K \rightarrow L$
5x5x25→25
L, L'
$L \rightarrow M$
3x3x25→25
18
5
Across Patch Features
500
SoftMax
Different
Same
M, M'
$K' \rightarrow L'$
5x5x25→25
$L' \rightarrow M'$
3x3x25→25
Patch Summary Features
Fully Connected
Tied Conv. Max Pooling
$\{g_i\}_{i=1}^{25}$
Tied Conv. Max Pooling