

Detección y Tracking de Objetos en Vídeo

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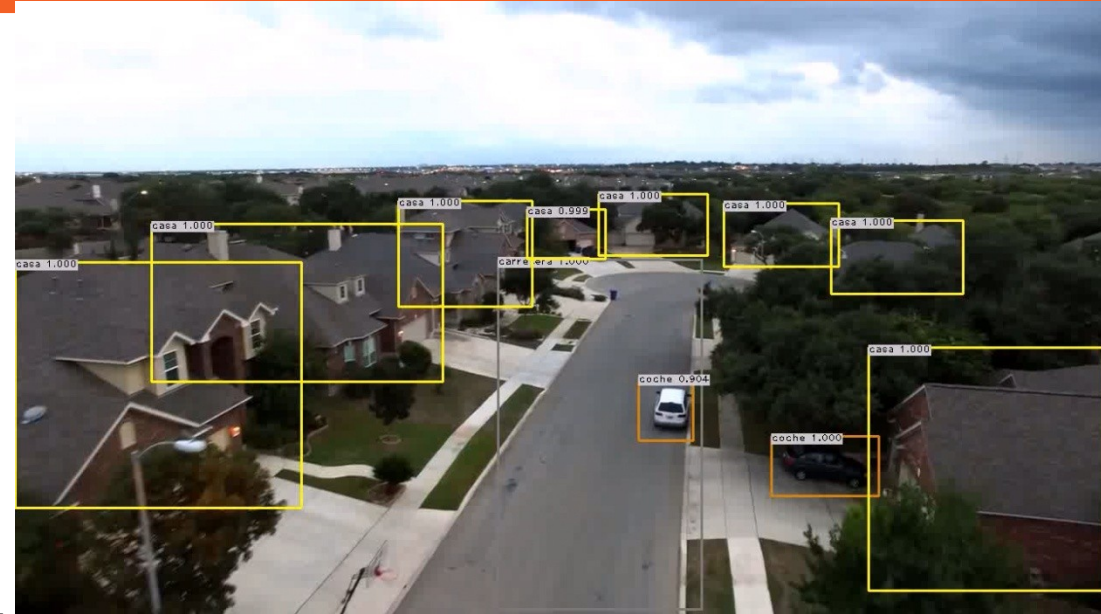
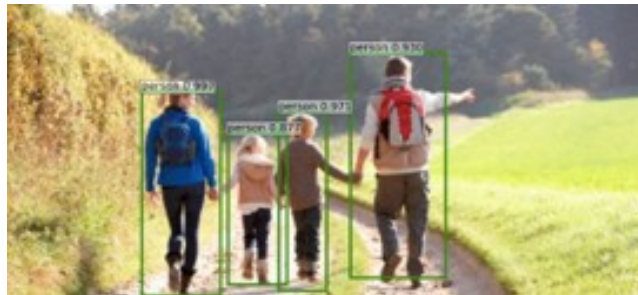
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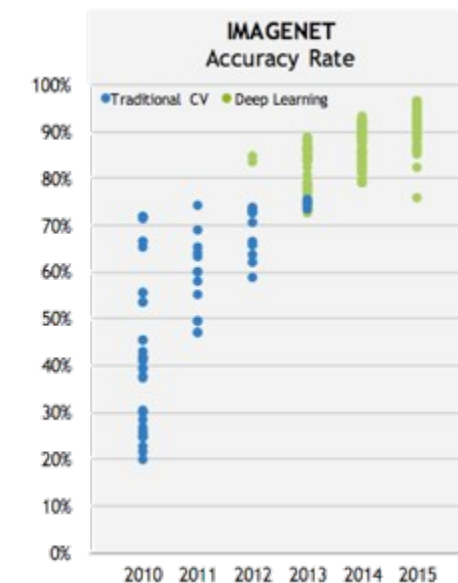
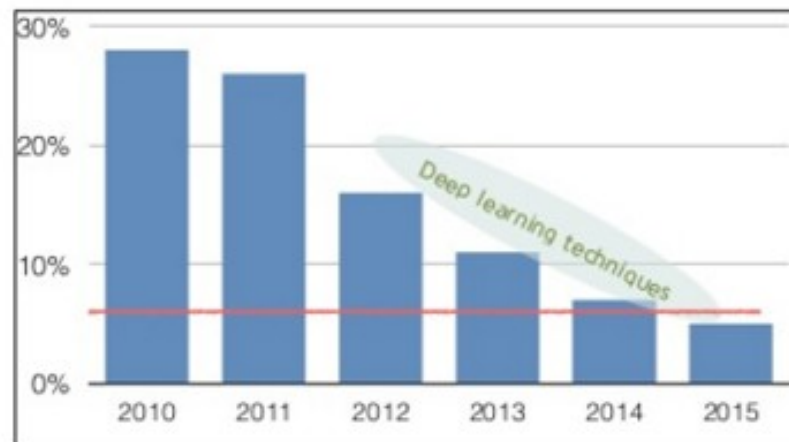
Visual object detection

Introduction

- Detection: location + class



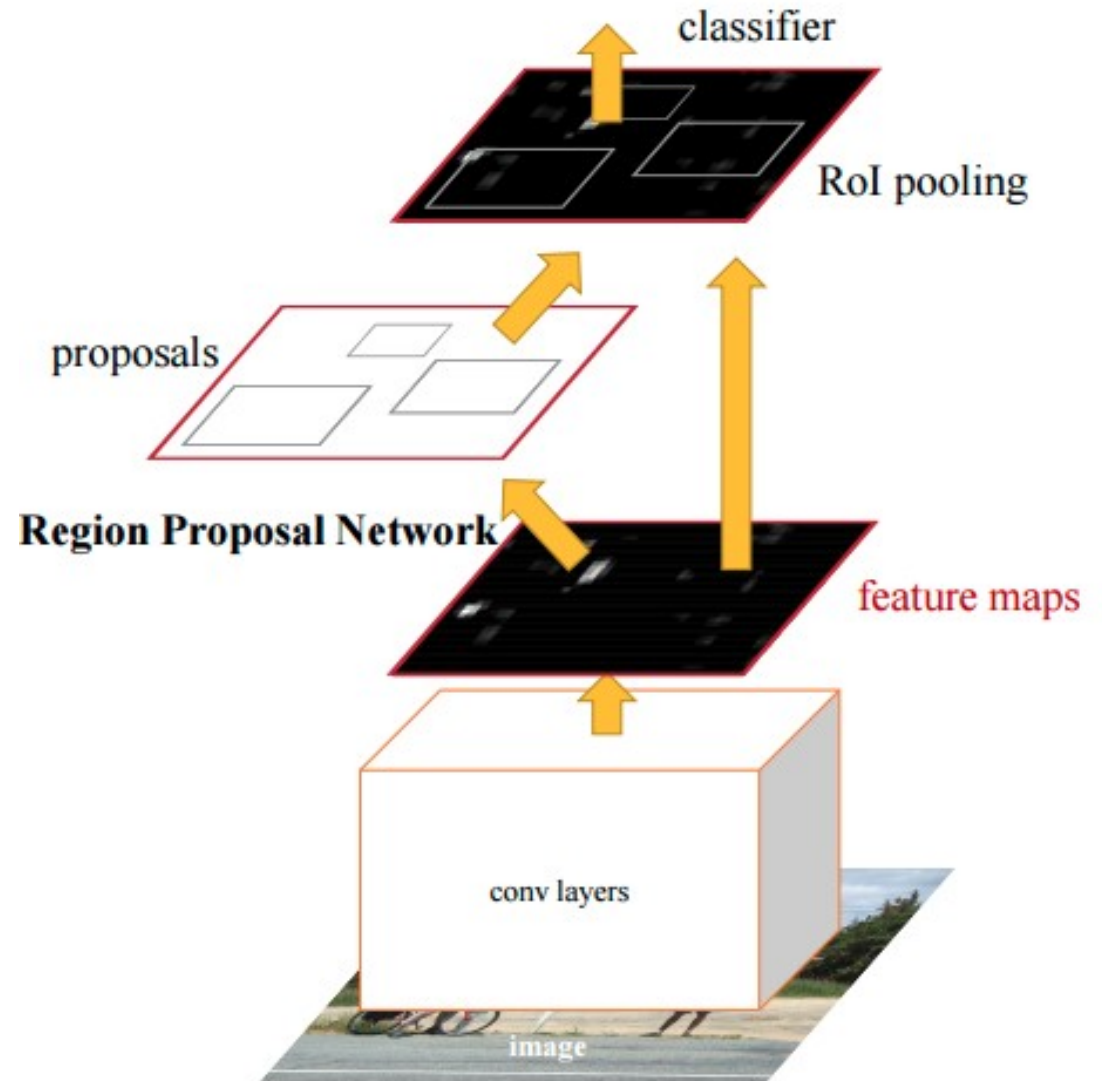
- The (r)evolution of Visual object detection: deep learning
 - ▷ For classification:



Visual object detection

Architecture for object detection

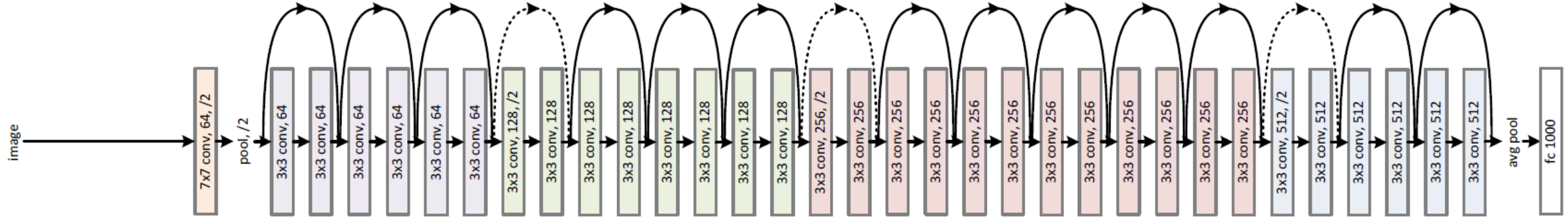
- Convolutional layers: features
- Region proposal network (RPN):
 - ▷ Class-agnostic
- Classification network for the RoIs



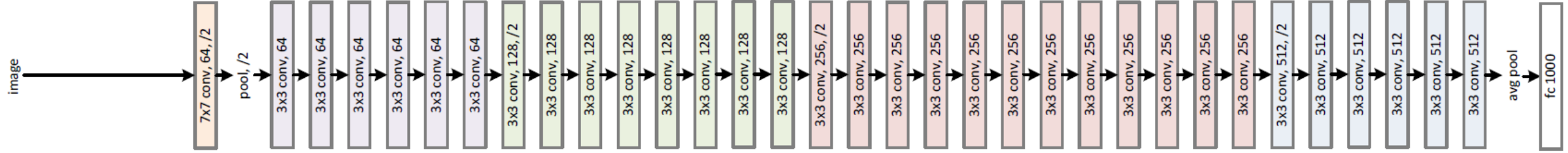
Visual object detection

Convolutional layers

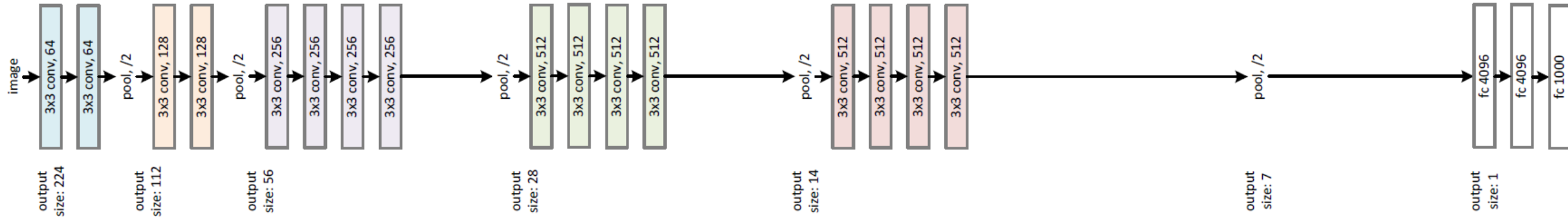
34-layer residual



34-layer plain



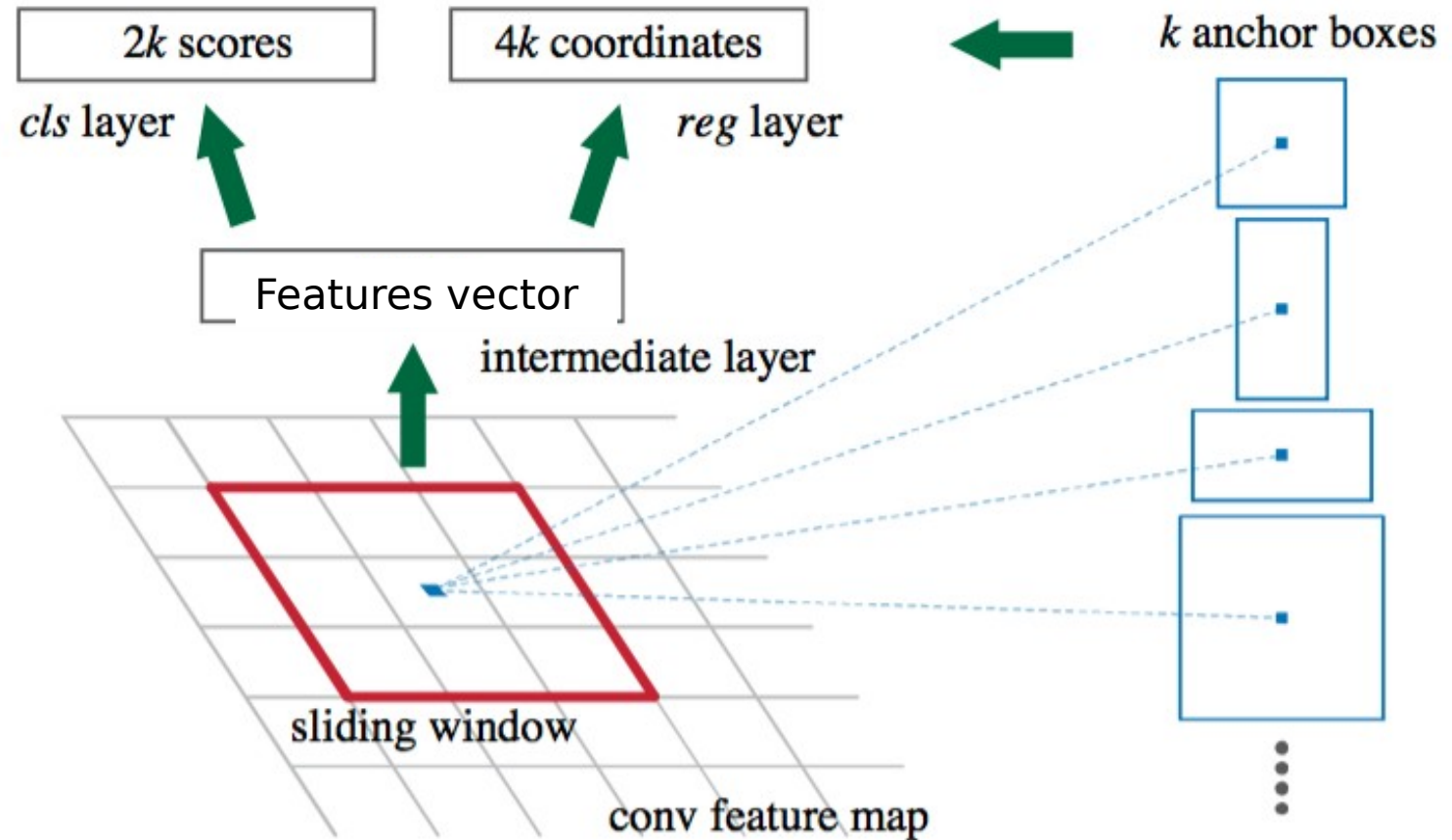
VGG-19



Visual object detection

Region Proposal Network (RPN)

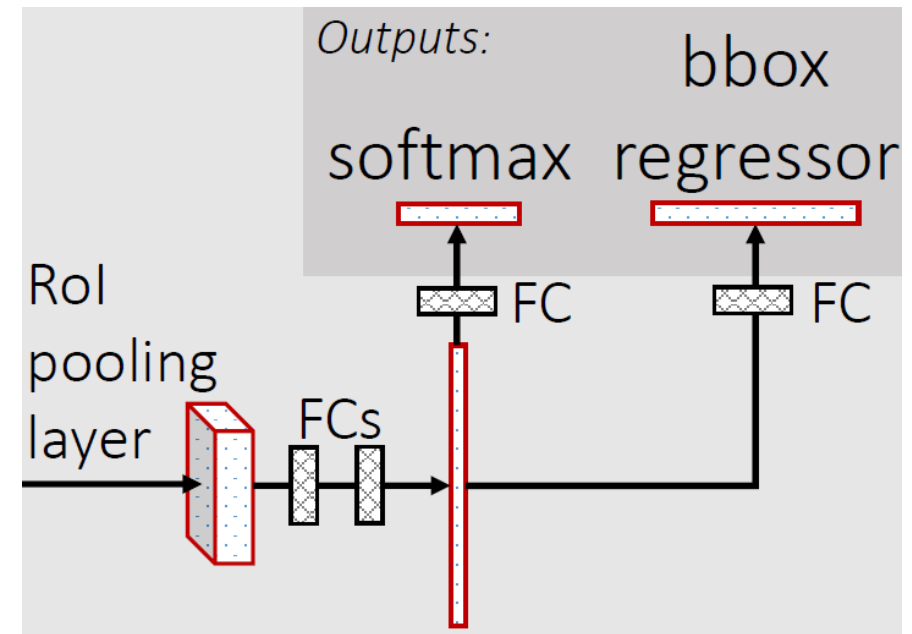
- Two sibling fully-connected layers:
 - ▷ Box-regression
 - ▷ Box-classification: 2 classes
- Anchors: multiple region proposals at each location
 - ▷ Translation-invariant: less parameters
 - ▷ Multi-scale objects: less computational cost



Visual object detection

Classification network

- RoI pooling layer:
 - ▷ Max pooling
 - ▷ Small feature map
 - ▷ Fixed spatial extent
- Softmax probabilities
 - ▷ N classes
- Per-class bounding-box regression offsets



Visual object detection

Results



Visual Object Detection

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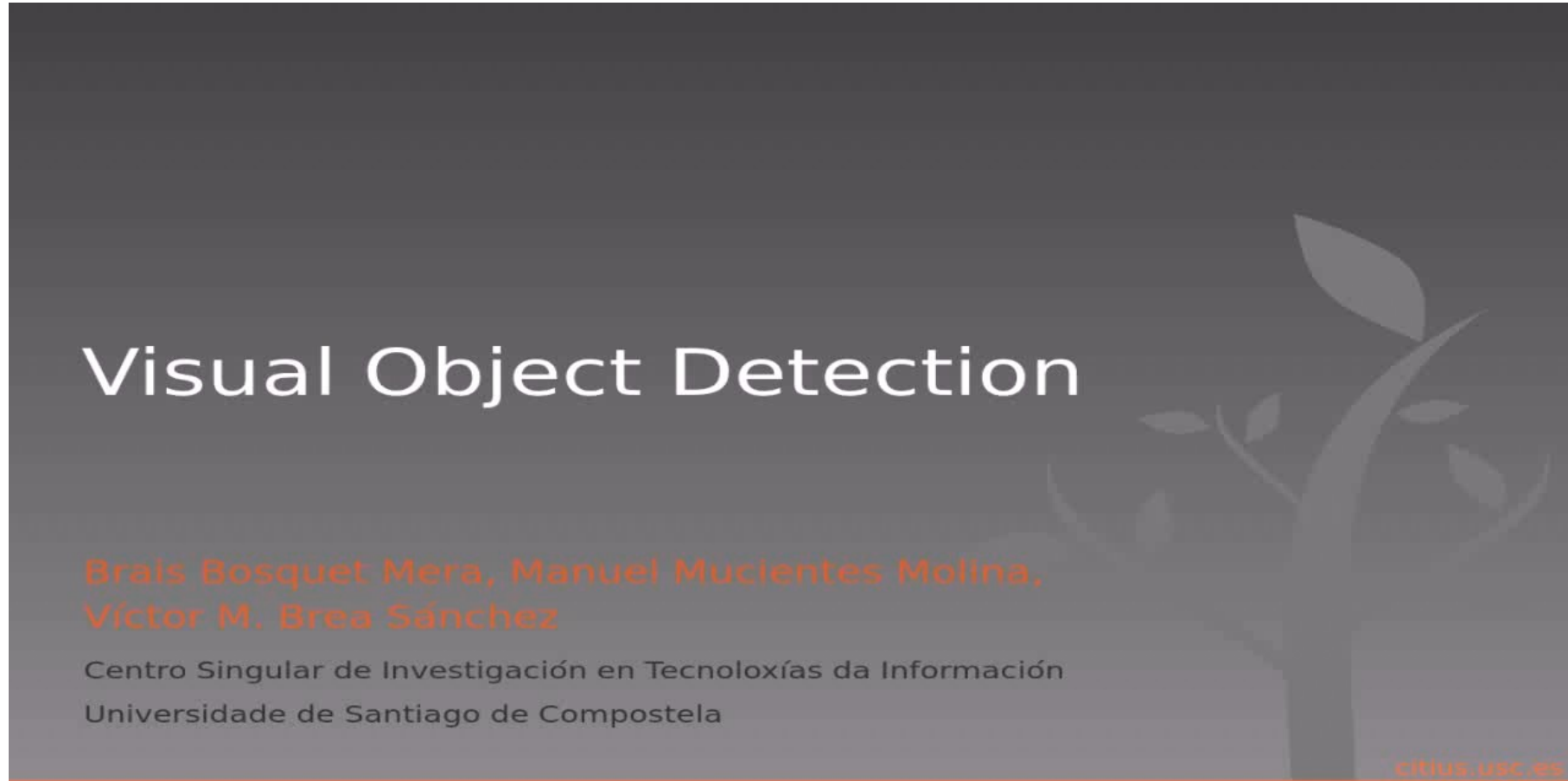
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Visual object detection

Results



Visual Object Detection

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Visual Object Tracking

Motivation

- Detect and keep the id of multiple moving objects
- Challenges: small objects, occlusions, abrupt motion, close and similar objects

Visual Tracking for Traffic Monitoring

Mauro Fernández Sanjurjo, Manuel Mucientes
Molina, Victor M. Brea Sánchez

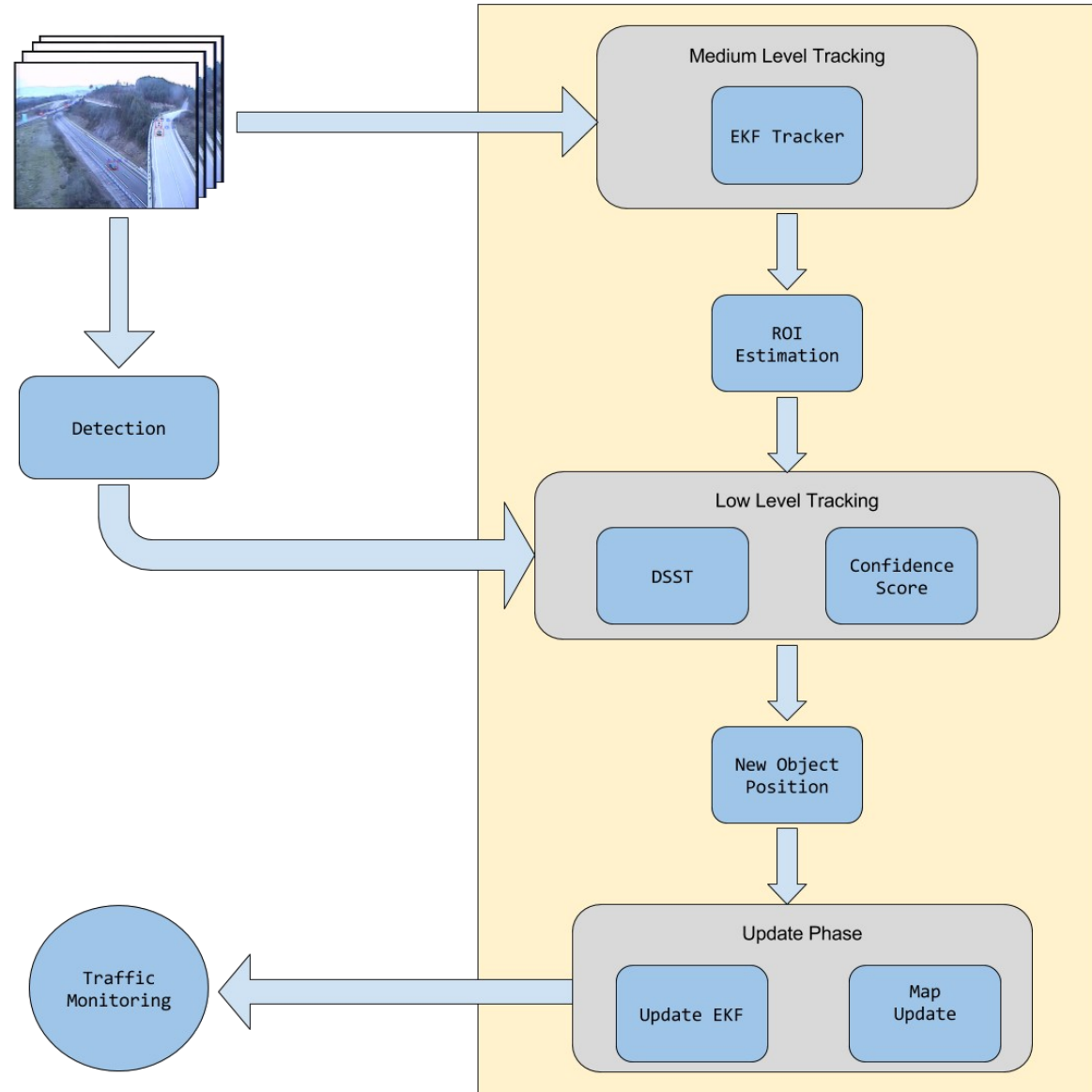
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Visual Object Tracking

Our approach

- Low level tracking
 - ▷ Local information: previous frame
- High Level Tracking
 - ▷ Global information
 - ▷ Probabilistic models



Visual Object Tracking

Drone tracking



Visual Object Tracking

Boat tracking

2015-04-21 12:17:59.45



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