

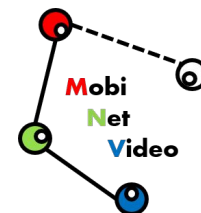
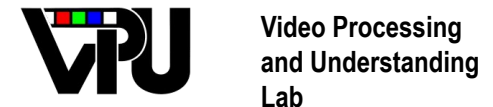
Demo Day

Continual Learning for Object Detection

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Master in Deep Learning for Audio and Video
Signal Processing



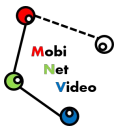
- **Introduction**

- Urbaser
- Why Continual Learning?

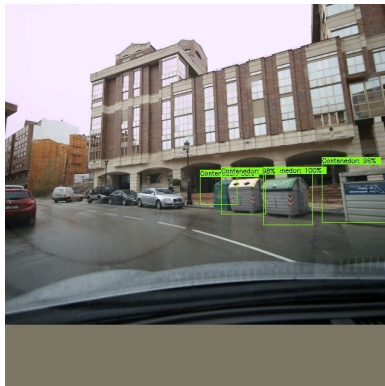
- **Project**

- Backend
- Frontend

- **Demo**



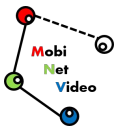
- Public contracts for garbage collection
- Container counting automation in different cities with object detection



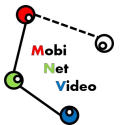
- System capable of learning cities incrementally
 - Take advantage of knowledge from other cities
 - Save training time
 - Save storage capacity

- *Catastrophic Forgetting*
 - Training in a city causes partially forgetting another previously learned

Train Benidorm from scratch			Train Soria after Benidorm		
Benidorm AP	Soria AP	mAP	Benidorm AP	Soria AP	mAP
0,293	0,024	0,159	0,136	0,378	0,257



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1. Data movement

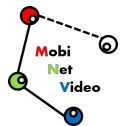
- Incremental training
- Mix data from different cities (Rehearsal)



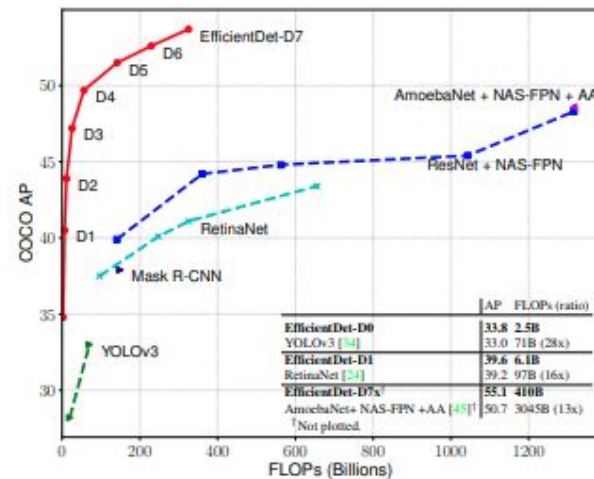
2. Model training

3. Validation in all cities

- File generation: metrics (mAP & recall)

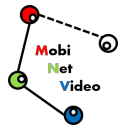


- EfficientDet
 - State of the art 27/07/2020 (paper)



*Tan, Mingxing, Pang, Ruoming, and Le, Quoc V, "EfficientDet: Scalable and Efficient Object Detection," 2019.

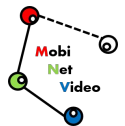
**<https://github.com/zylo117/Yet-Another-EfficientDet-Pytorch>



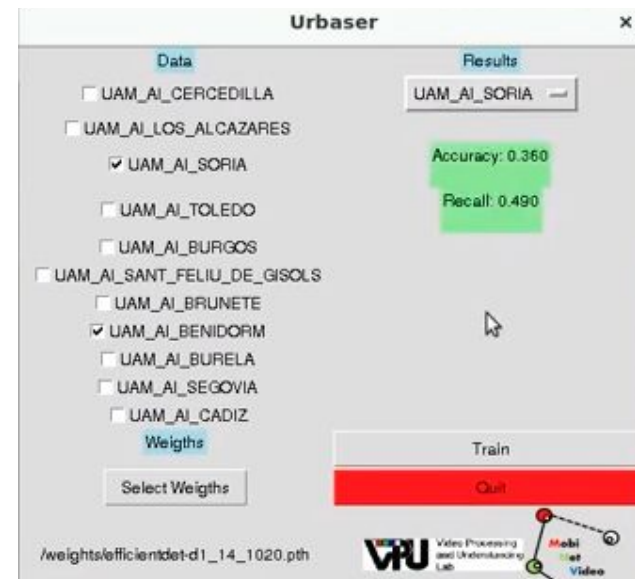
- Benidorm vs Soria

1. Train only in Benidorm (TL w/o fine tuning)
2. Train in Benidorm and train in Soria afterwards (Incremental)
3. Train in Benidorm and Soria together (*Rehearsal*)

1. Transfer Learning			2. Incremental			3. <i>Rehearsal</i>		
Benidorm AP	Soria AP	mAP	Benidorm AP	Soria AP	mAP	Benidorm AP	Soria AP	mAP
0,463	0,406	0,435	0,274	0,511	0,393	0,480	0,497	0,489



- Interface with Tkinter
 - Data and weights selection
 - Call to scripts that execute the workflow
 - “Train” button
 - Metrics display



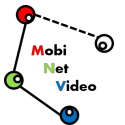
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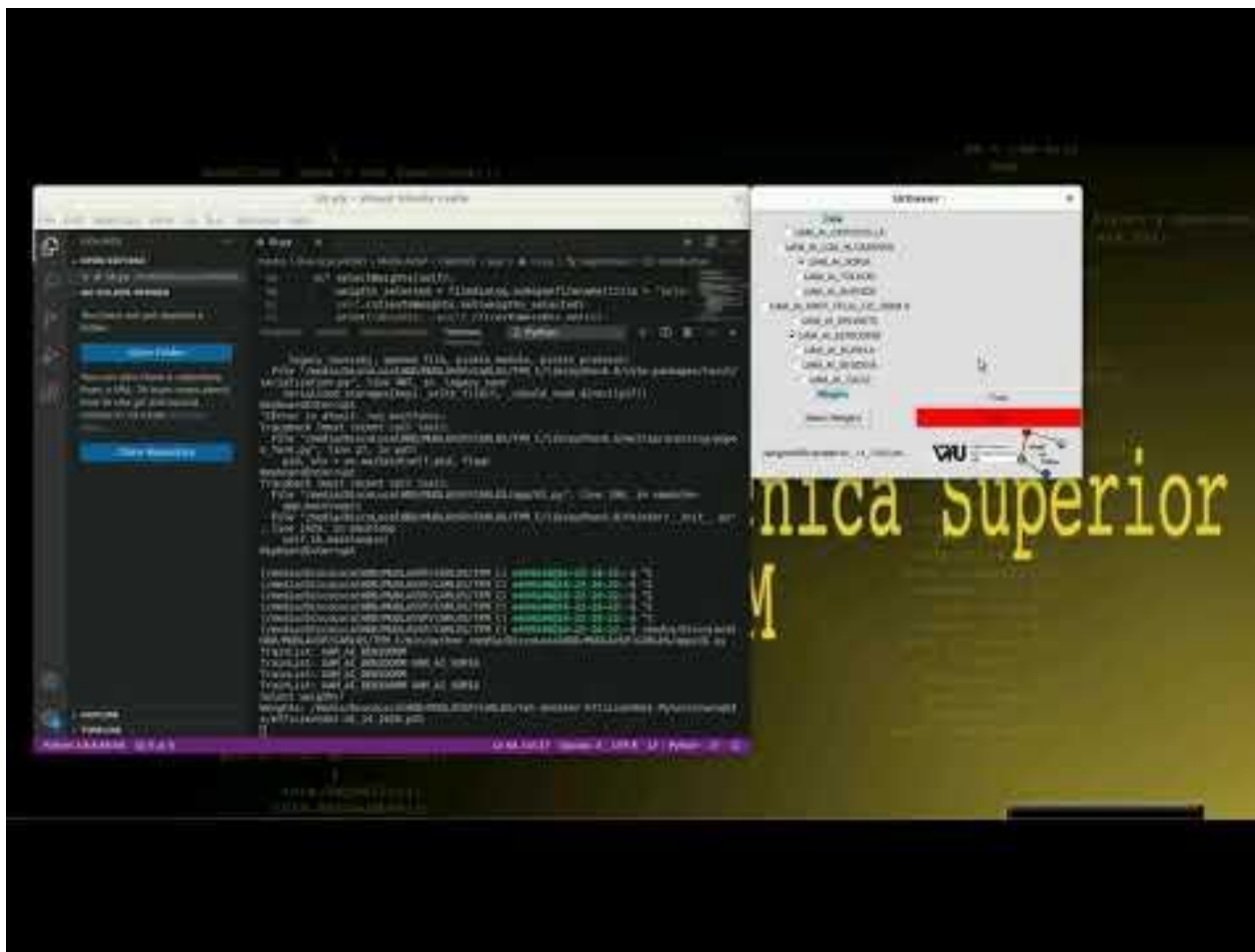
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https://youtu.be/razJ6DH9_3E

