

MHRI Dataset

Incremental Learning from

Human Interaction pipeline

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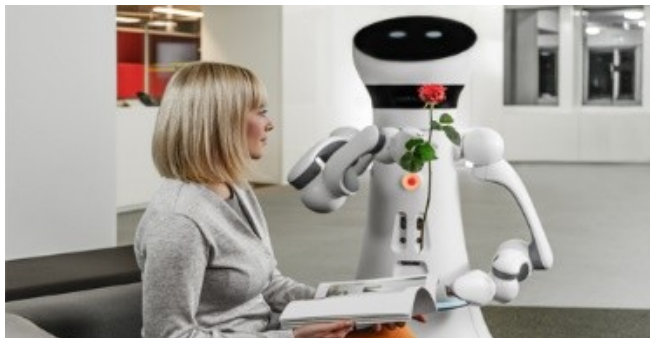
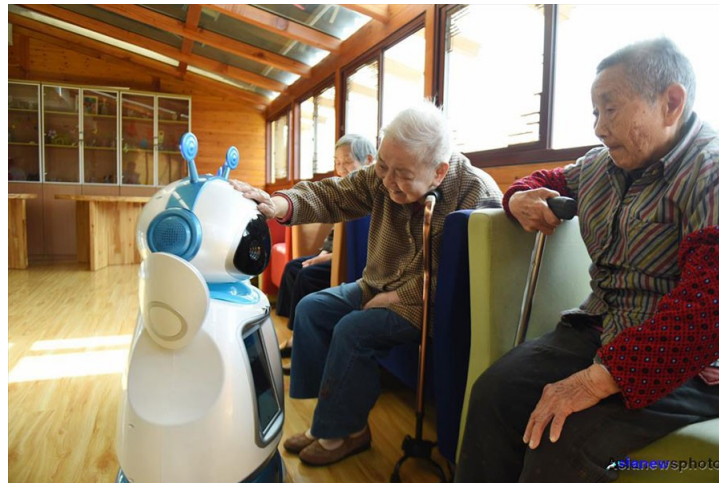
²Centre de Recherche Inria Bordeaux - Sud-Ouest, France

³Instituto Superior Técnico, GAIPS – TagusPark, Lisbon

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Motivation

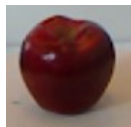
Motivation



Motivation

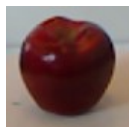
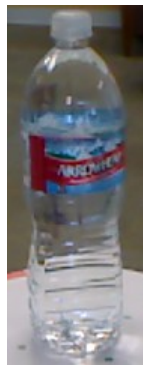
Motivation

Objects in academic datasets



Motivation

Objects in academic datasets



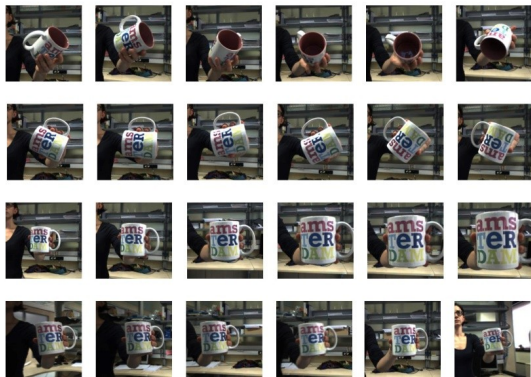
Objects *in the wild*



Motivation

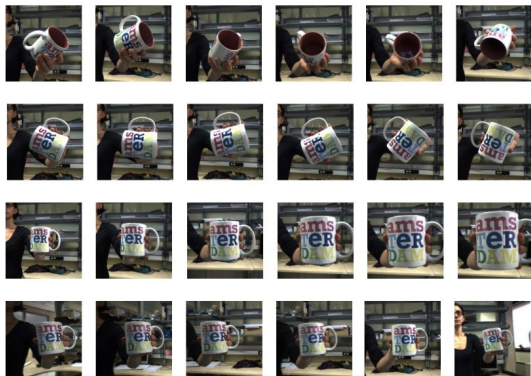
Motivation

Clean interaction

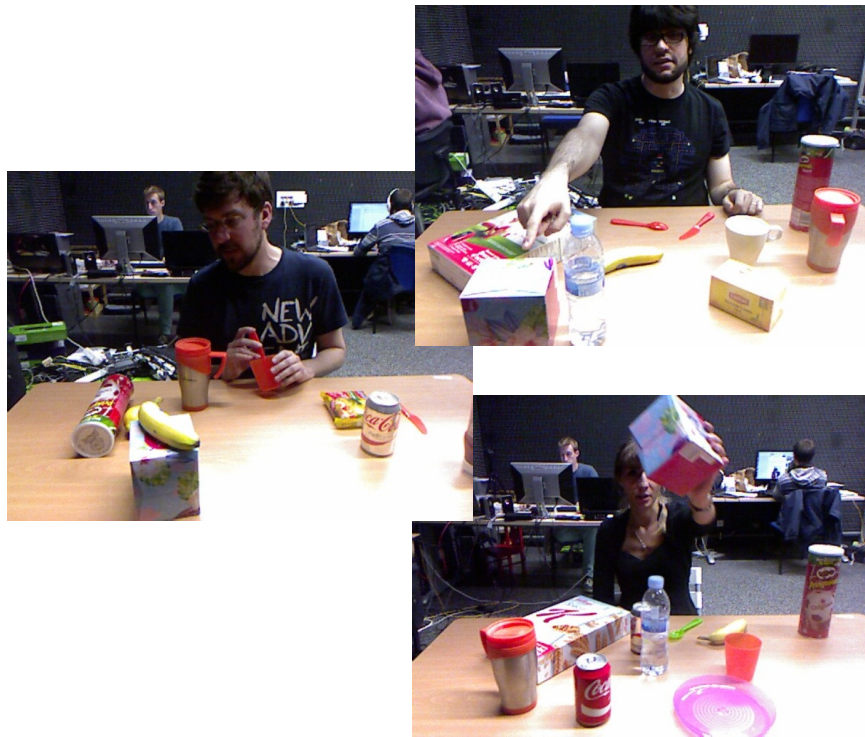


Motivation

Clean interaction



Realistic interaction

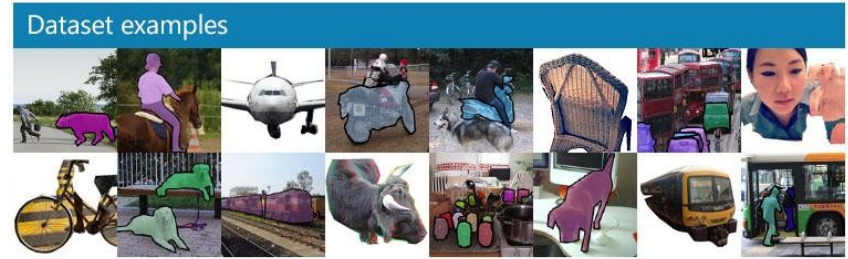


Our Goal:

To learn object models from realistic user interactions

Related works

- **Object Recognition from robots:**
 - A. Collet, D. Berenson, S. S. Srinivasa, and D. Ferguson. Object recognition and full pose registration from a single image for robotic manipulation. In IEEE Int. Conf. on Robotics and Automation , pages 48–55, May 2009.
 - J. Kenney, T. Buckley, and O. Brock. Interactive segmentation for manipulation in unstructured environments. In IEEE Int. Conf. on Robotics and Automation , pages 1377–1382, 2009



MS COCO
(<http://cocodataset.org>)

ImageNet Dataset

IMAGENET



Russakovsky, O., Deng, J., Su, H., Krause, J., Satheesh, S., Ma, S., ... & Fei-Fei, L. (2015). [Imagenet large scale visual recognition challenge](#). *arXiv preprint arXiv:1409.0575*. [[web](#)]

- **Object learning from HRI:**
 - G. Pasquale, C. Ciliberto, F. Odone, L. Rosasco, L. Natale, and I. dei Sistemi. Teaching iCub to recognize objects using deep convolutional neural networks. Proc. Work. Mach. Learning Interactive Syst , pages 21–25, 2015.

ImageNet

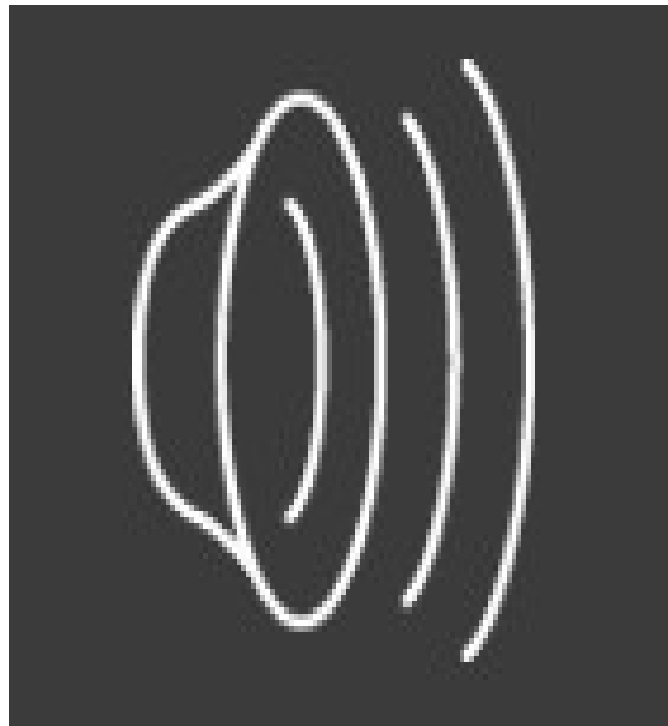
<http://www.image-net.org/>

Dataset

MHRI Dataset

- https://sites.google.com/a/unizar.es/iglu_mhri/

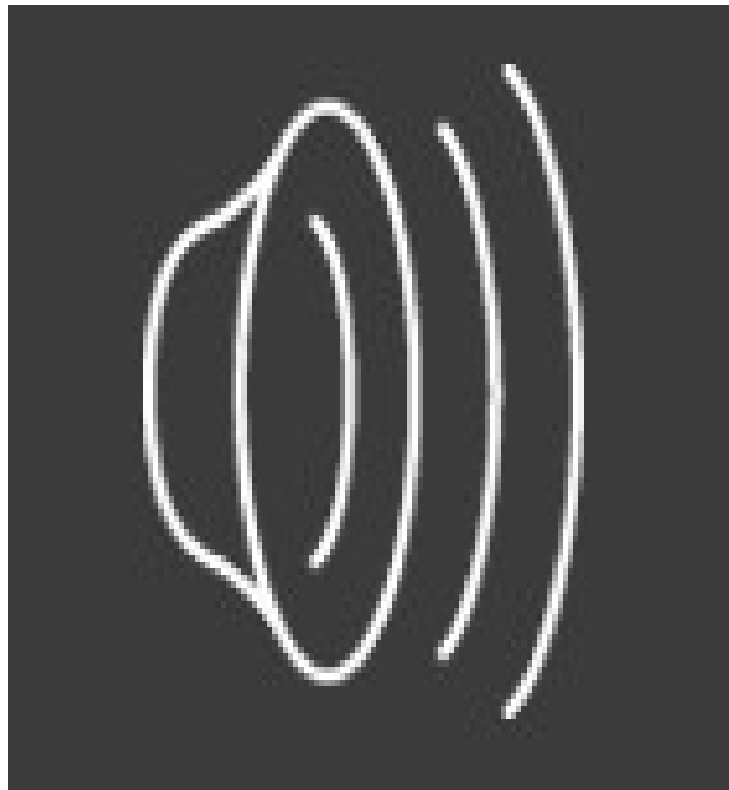
Users	10	
Interaction Type	3	Point, Show, Speak
Interactions per User	30	10 of each type, 1 object per interaction
Object Pool	22	Apple, Banana, Big Mug, Bowl, Cereal Box, Coke, Diet Coke, Glass, Fork, Ketchup, Kleenex, Knife, Lemon, Lime, Mug, Noodles, Orange, Plate, Pringles, Spoon, Tea Box, Water Bottle



MHRI Dataset

- https://sites.google.com/a/unizar.es/iglu_mhri/

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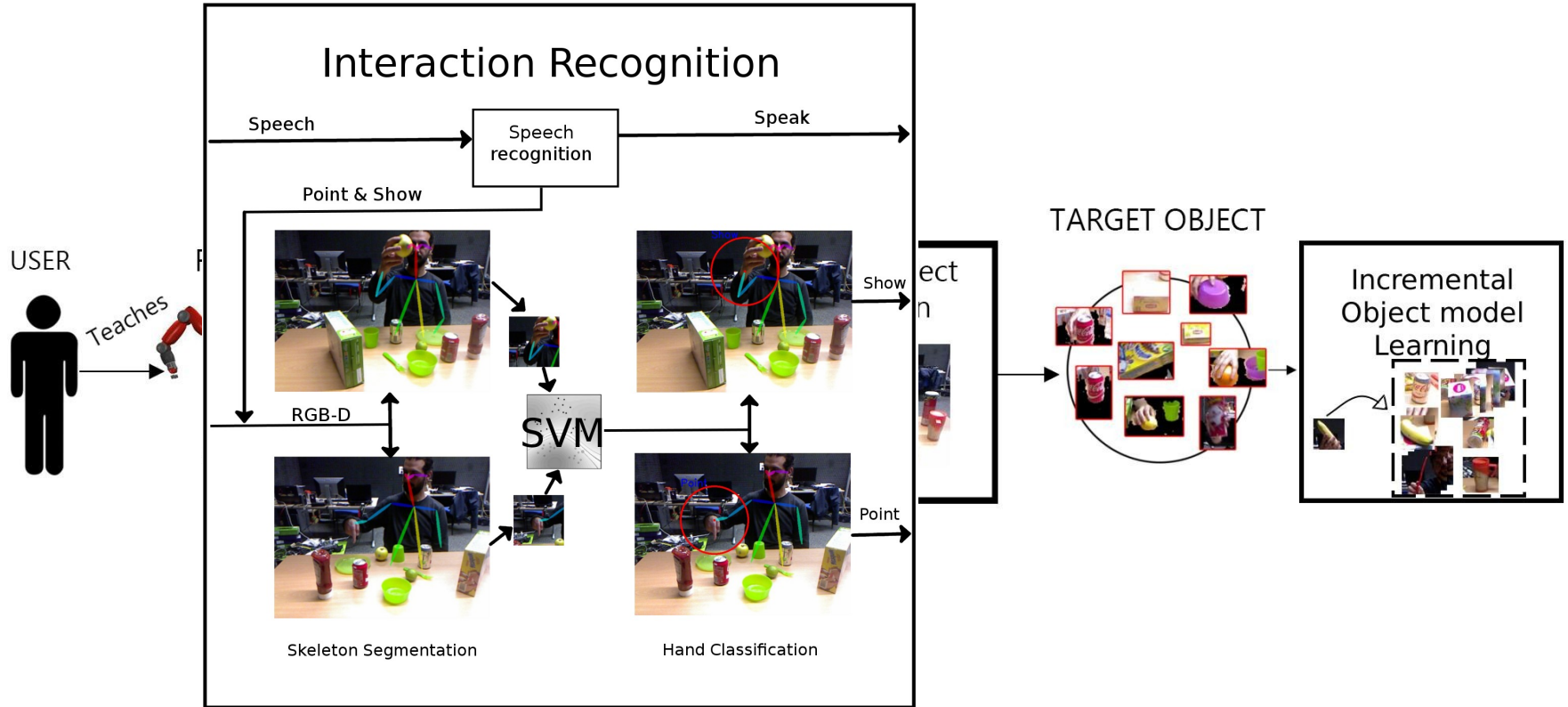


Incremental Learning from Human Interaction pipeline

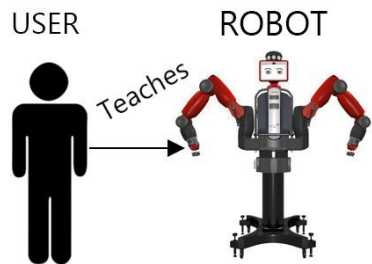
Pipeline Overview (I)



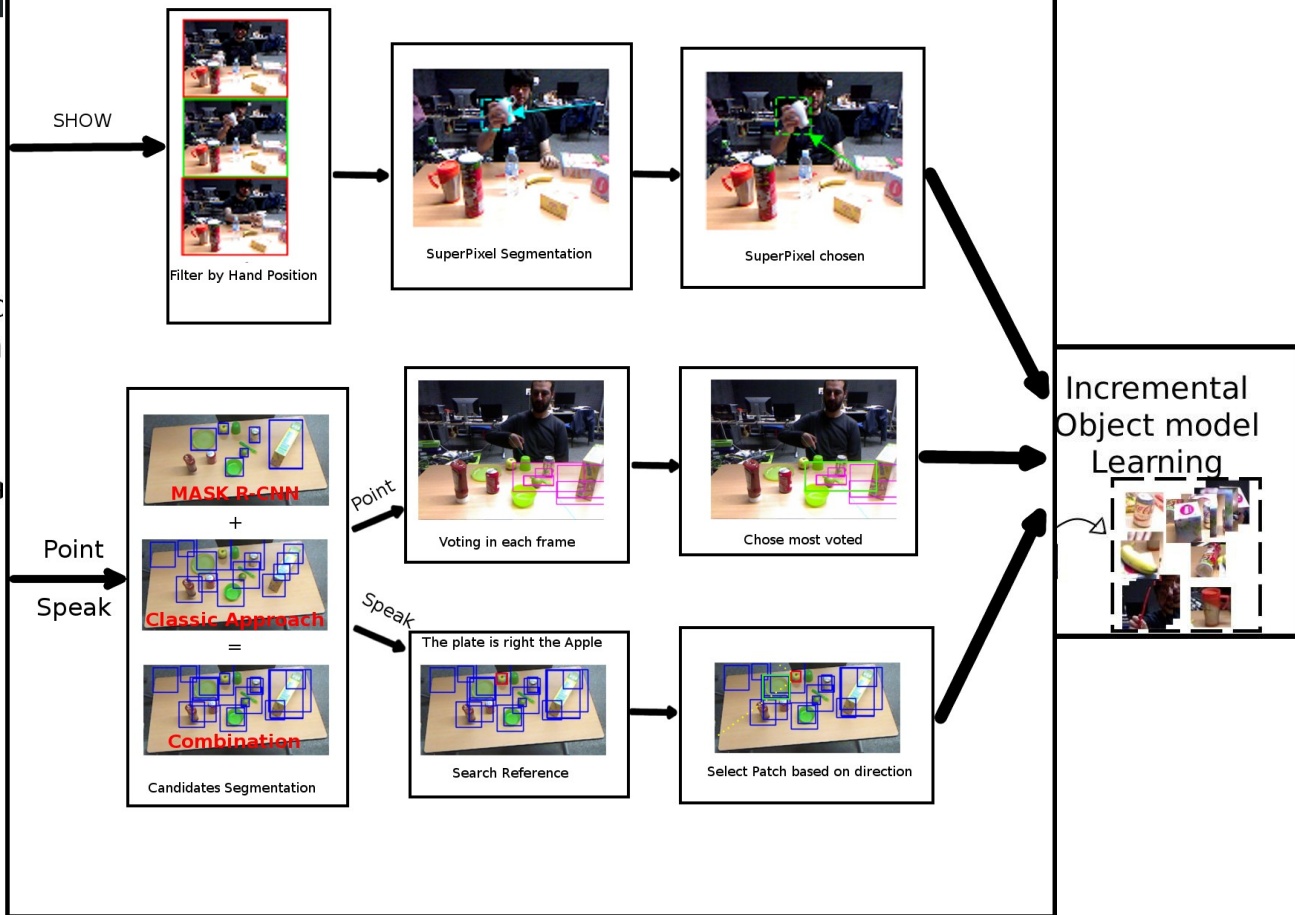
Pipeline Overview (II)



Pipeline Overview

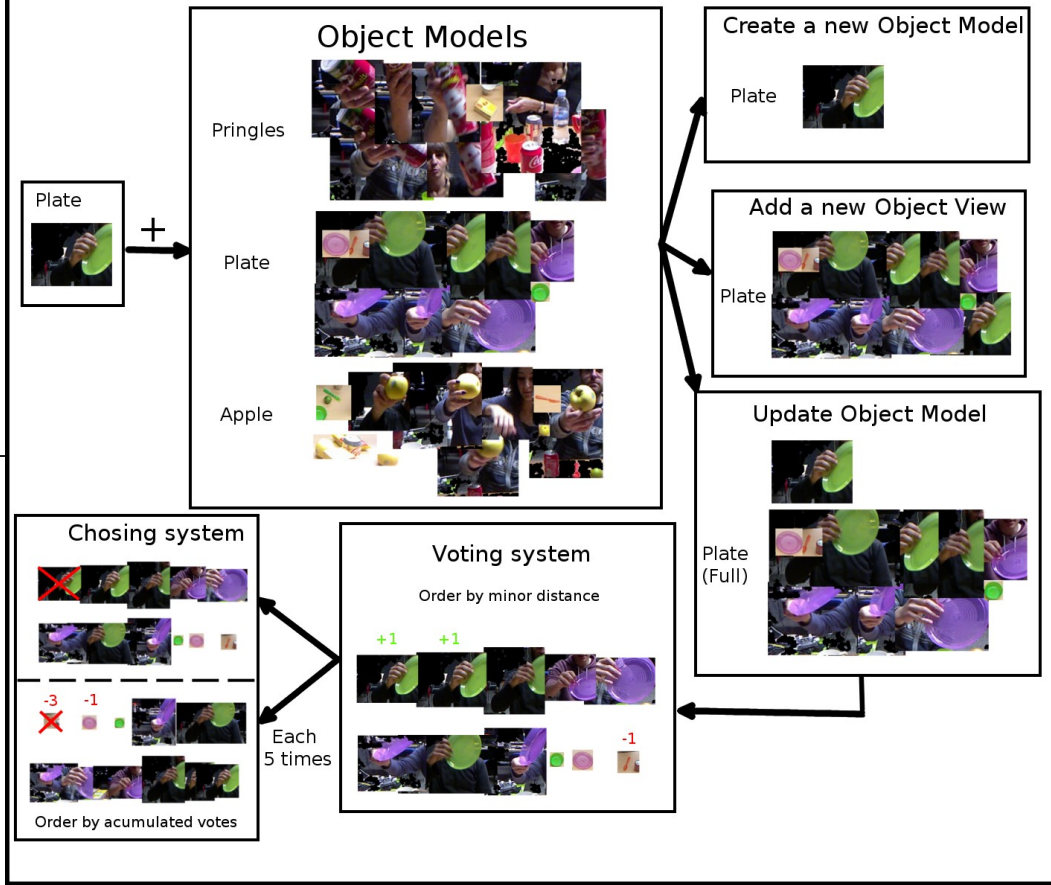
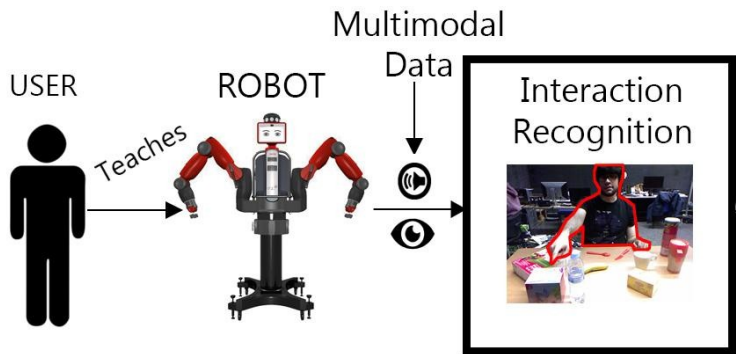


TARGET OBJECT DETECTION



Incremental Object Model Learning

Pipeline Overview (IV)



Live Demo