Segment Anything Model

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SAM

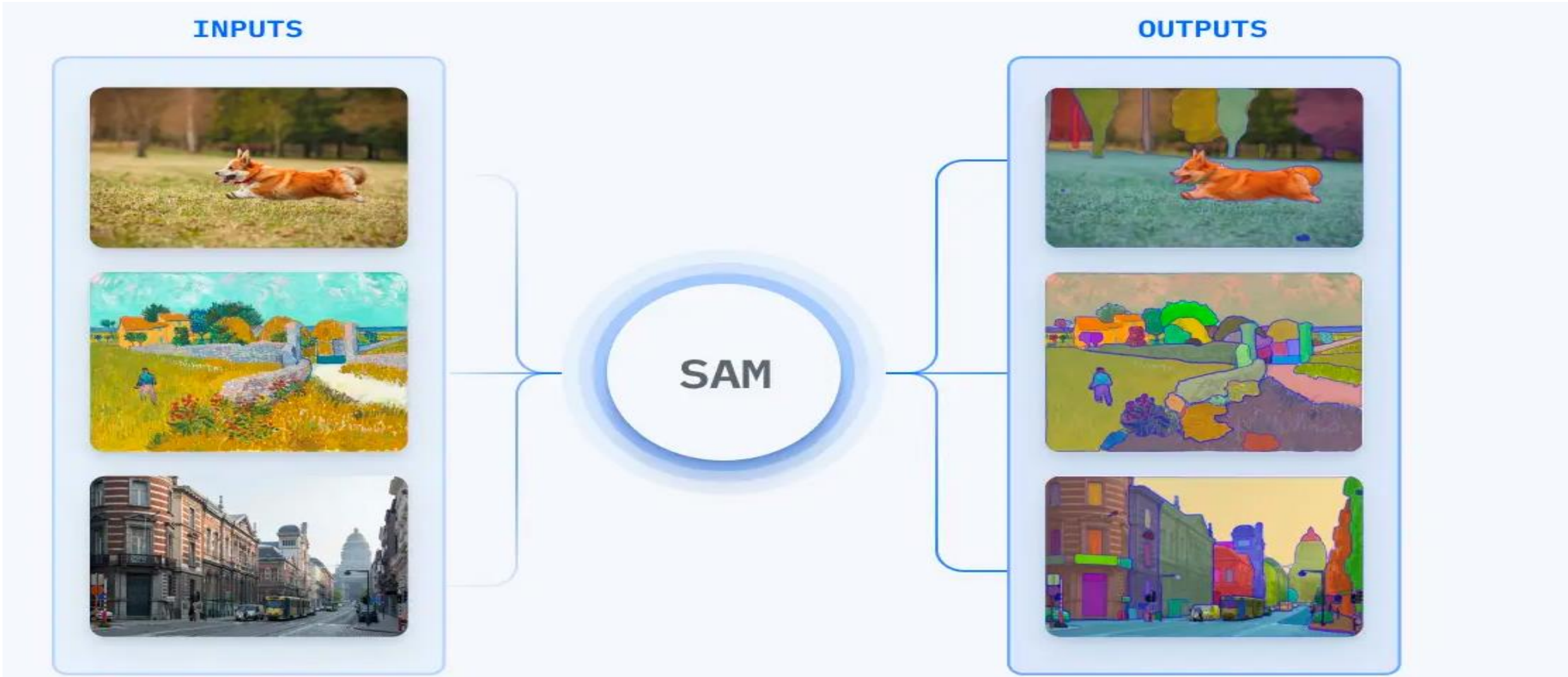
1.What is the Segment Anything Project?

Segment Anything is a new project by Meta to build two important components:

- A large dataset for image segmentation
- The Segment Anything Model (SAM) as a promptable foundation model for image segmentation

It was introduced in the Segment Anything paper by Alexander Kirillov et al.

1.What is the Segment Anything Model?



1.What is the Segment Anything Model?

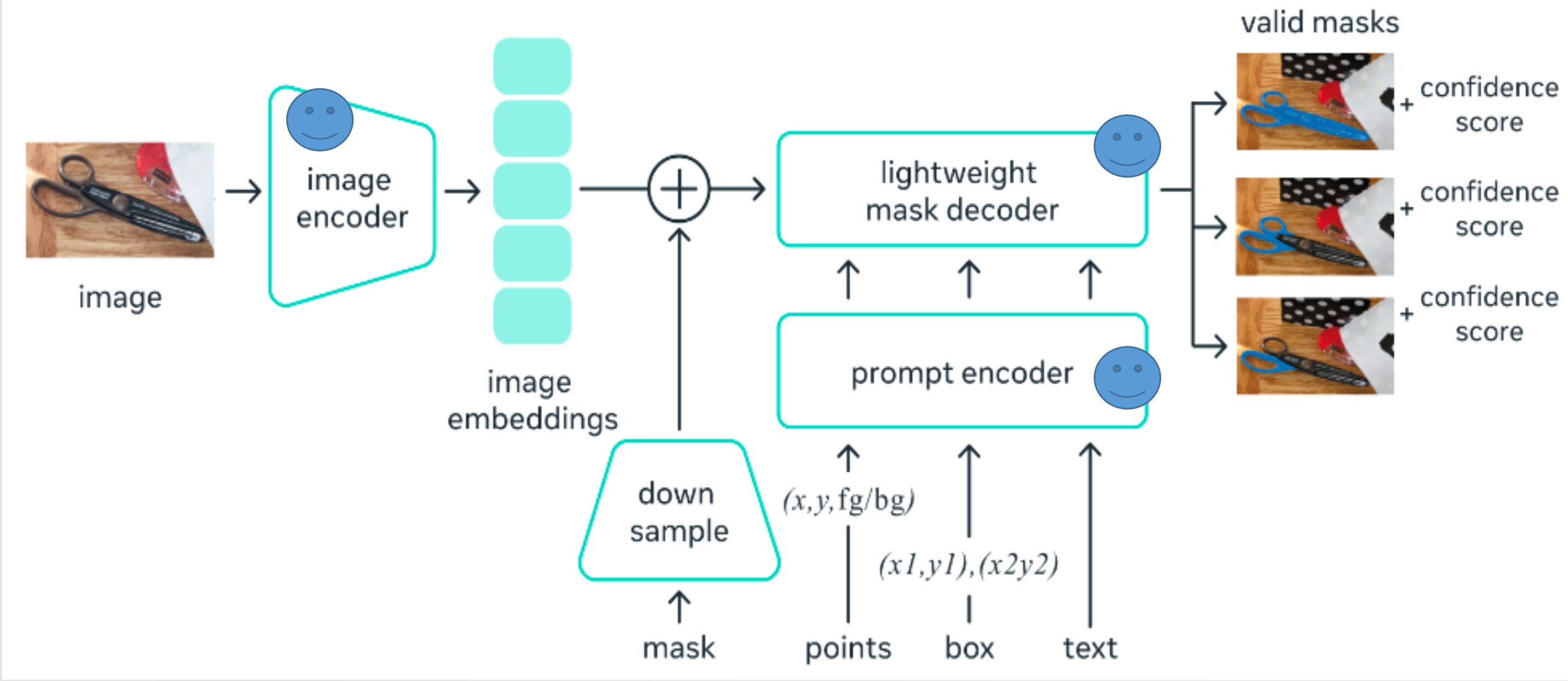
Simplify the segmentation process

Can be prompted with various inputs, including clicks, boxes, or text

roboflow

YOLO

1.How does SAM work?



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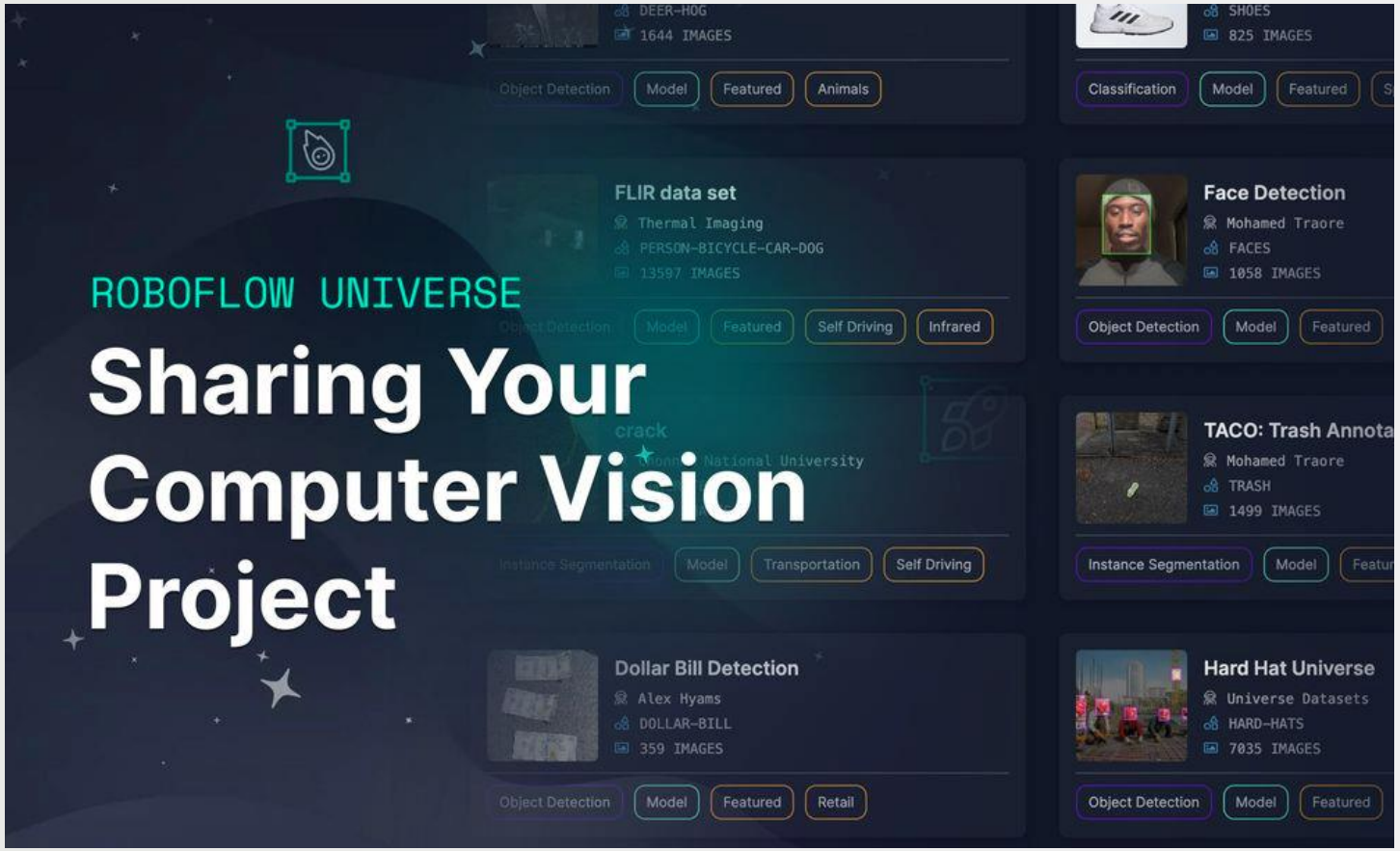
2.SAM with RoboFlow

RoboFlow is a computer vision platform, designed for users to create datasets, train models, and deploy to production.



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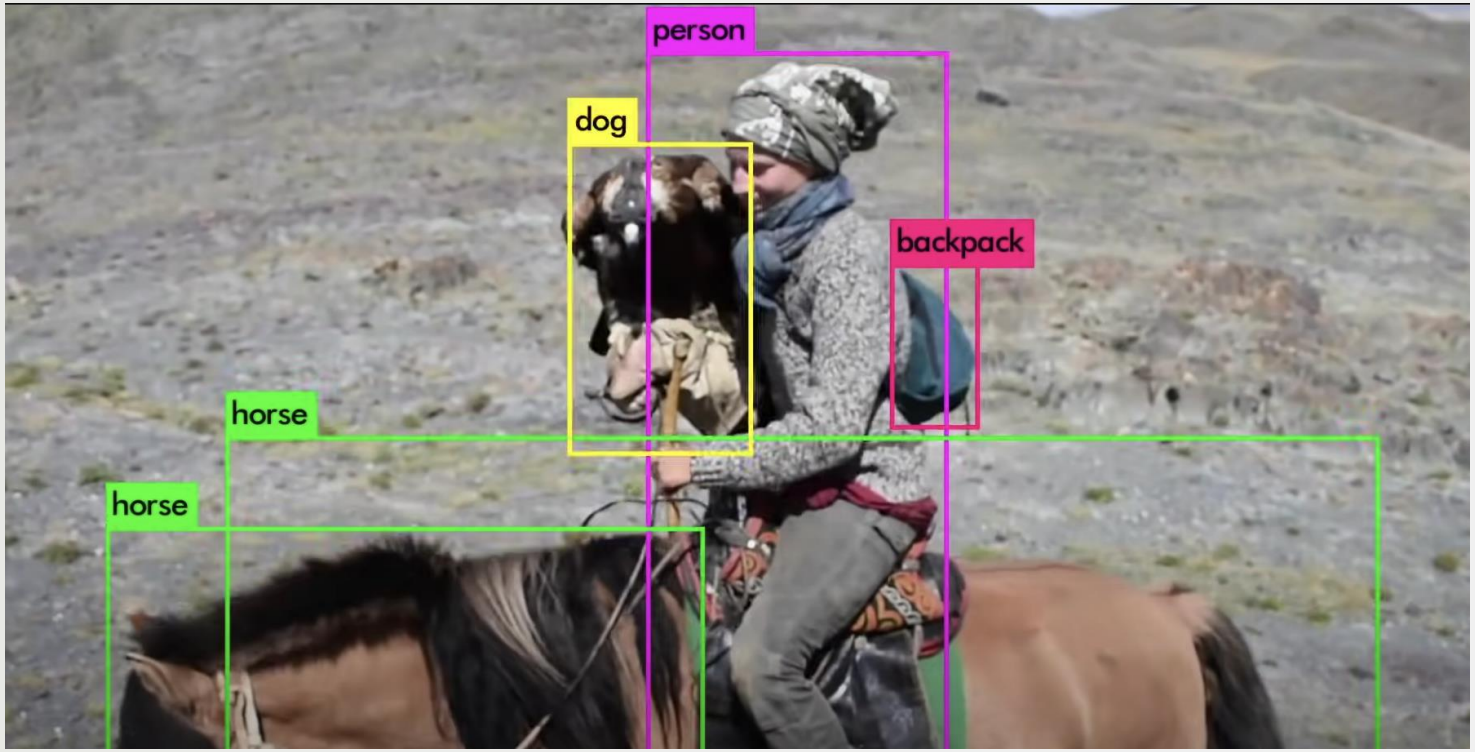
3.SAM with YOLO annotation

You only look once (YOLO) is a state-of-the-art, real-time object detection system.



3.how to use YOLO with SAM

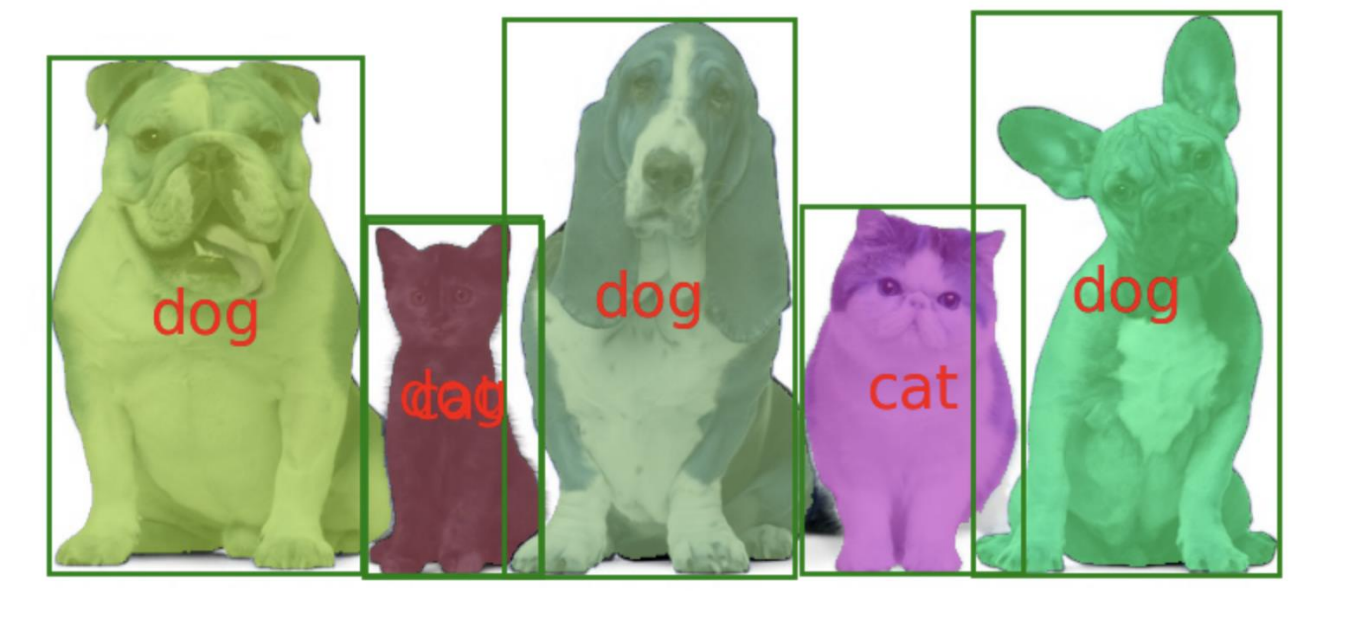
First, YOLO detect the objects and add the labels.

3.how to use YOLO with SAM

Second, Once we have the results from YOLOv8, we can extract the bounding box coordinates for the detected objects. Send it to SAM to get the mask.

3.SAM with YOLO annotation

My Cat and dog example:
YOLO+SAM



3.SAM with YOLO annotation

Conclusion:
YOLO mark the region and corresponding label, SAM do the segmentation.

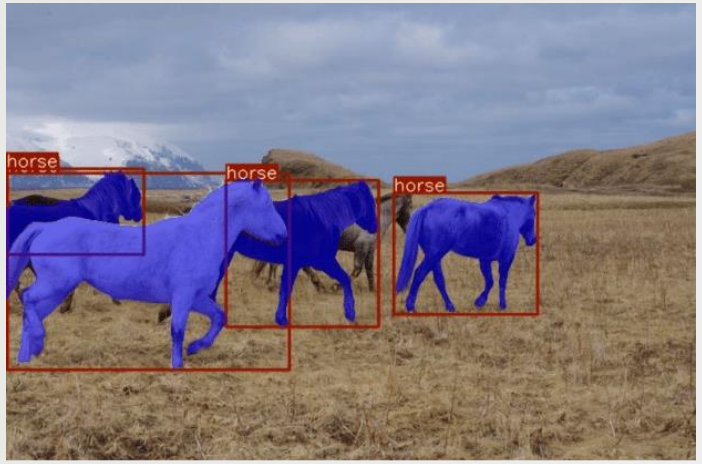
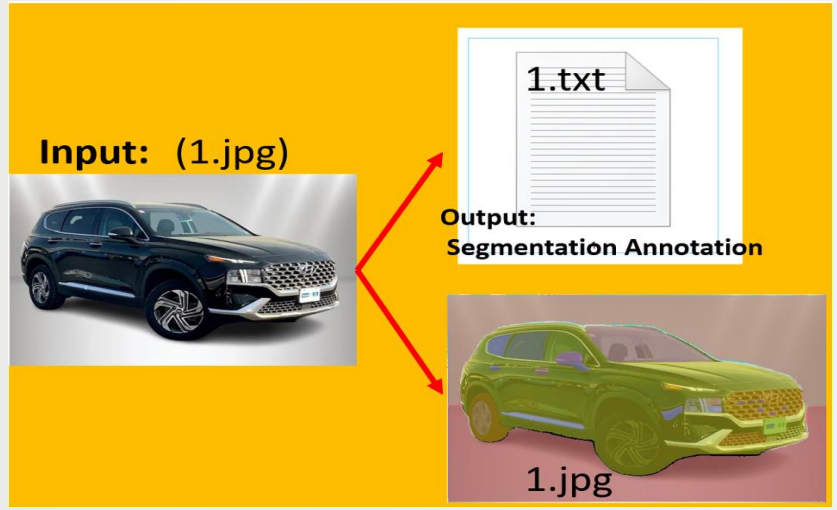


Image Segmentation with YOLO-NAS and SAM



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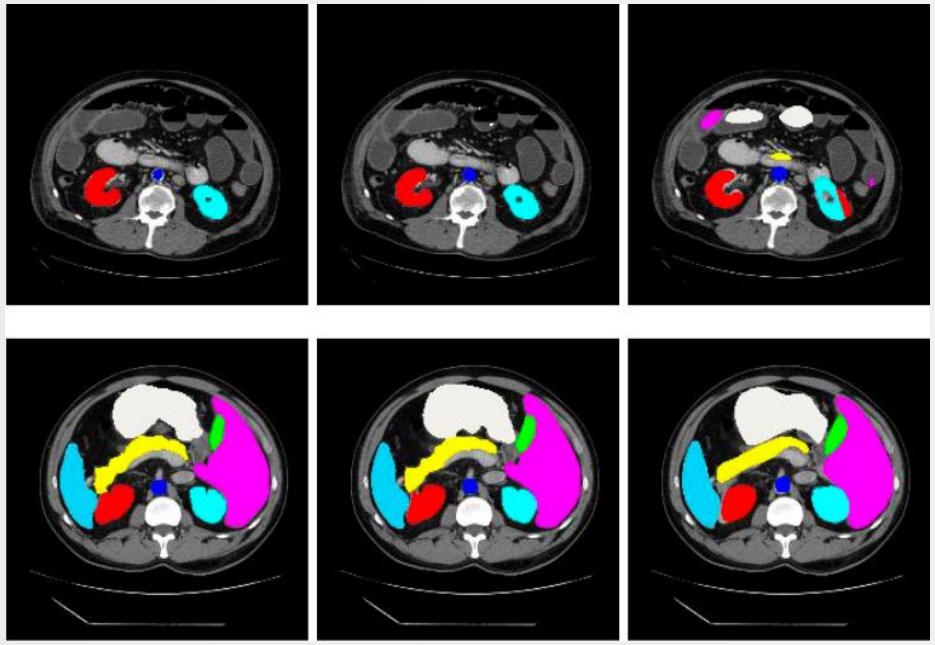
4.Simple fine-tuning SAM

Although SAM has powerful zero-shot generalization capabilities, its direct recognition performance in highly specialized domains, especially in medical imaging, still needs improvement.

Nevertheless, simple fine-tuning of SAM can greatly enhance the predictive performance of the trained model.



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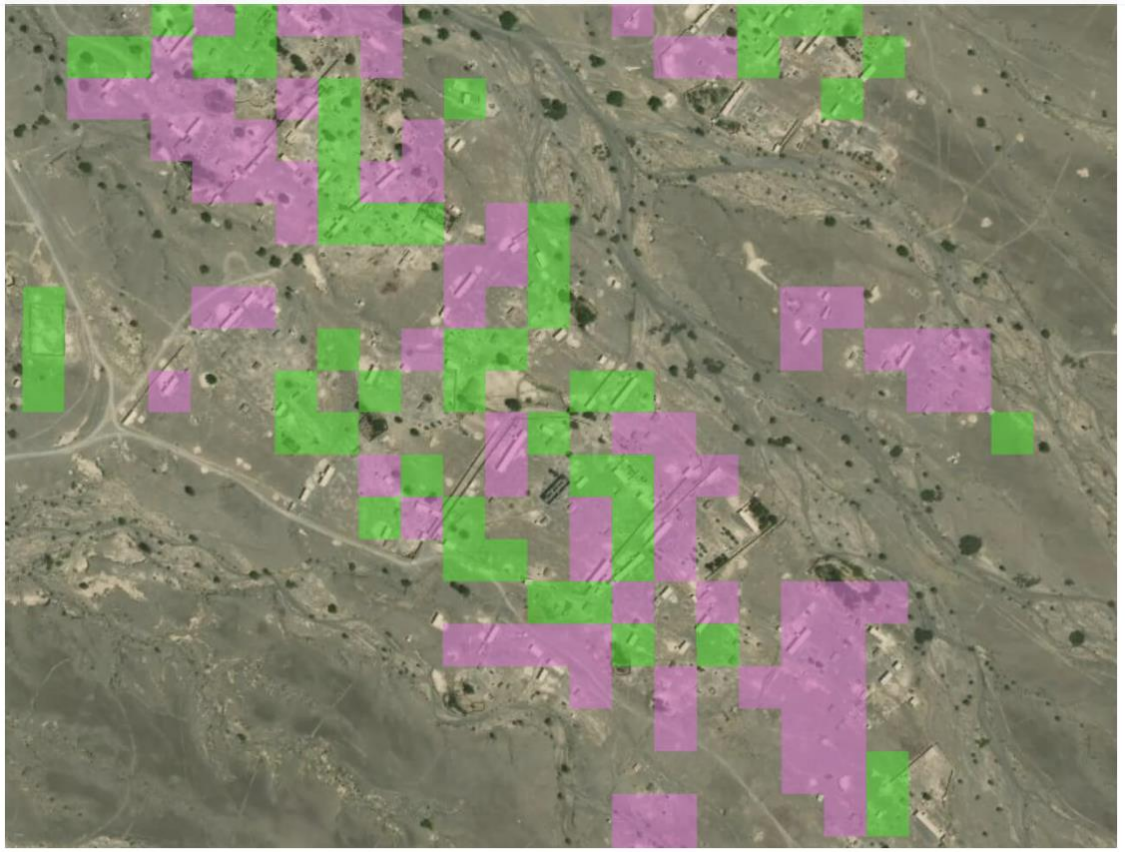
SAM

5. Applications

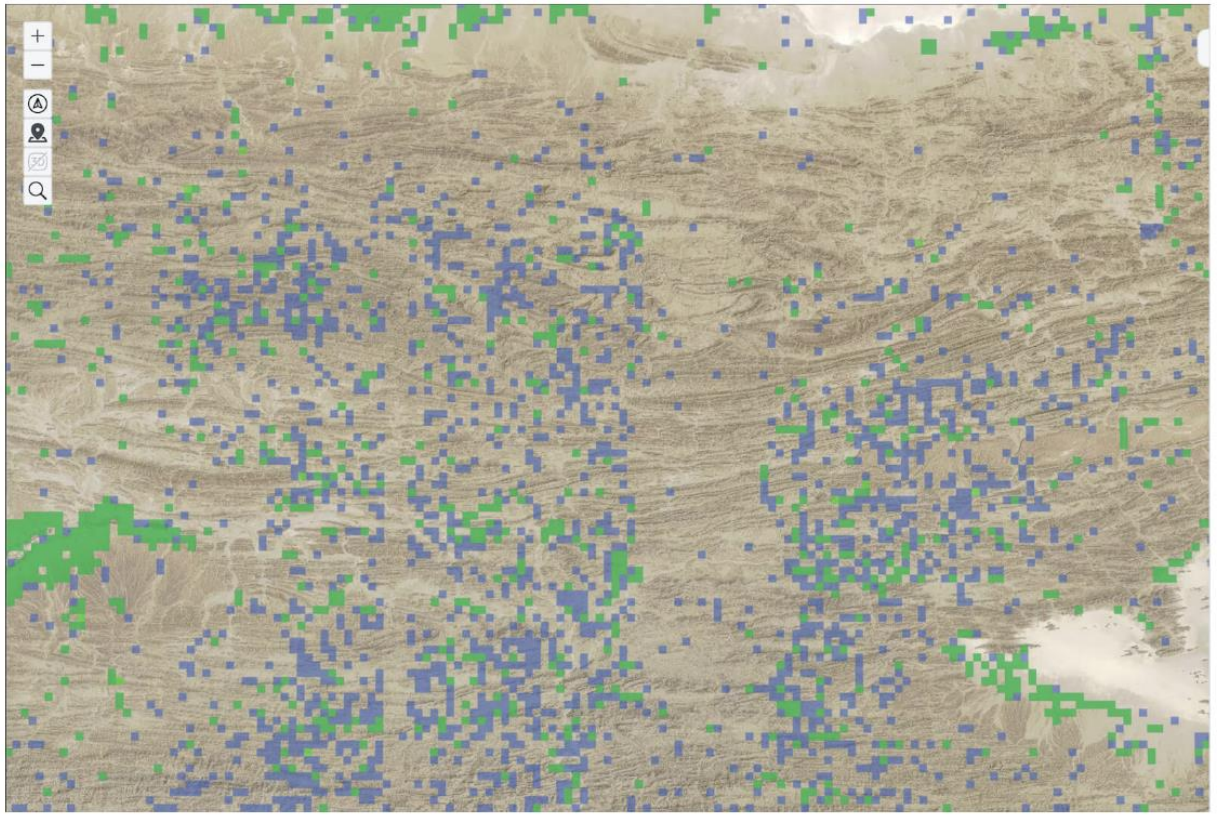
This example describes a method for predicting population density by identifying buildings. By recognizing buildings and combining their locations with other geographic data, it is possible to infer population density distribution, which is crucial for tasks such as vaccine distribution planning and population statistics.



Tiles in which Facebook model predicts a structure in green, combined with tiles in which OpenStreetMap predicts a structure, which are subsequently added to the Facebook Population Density Map.

5. Applications

By simplifying the segmentation process and reducing the need for task-specific models, SAM empowers users across diverse industries to tackle image segmentation challenges with unprecedented ease.



Map of Pakistan with false positives from the original model in blue, and fewer false positives from the new digital surface model in green.

5. Trends and conclusion

- By simplifying the segmentation process and reducing the need for task-specific models, SAM empowers users across diverse industries to tackle image segmentation challenges with unprecedented ease.

- This offers many possibilities, where SAM's flexible design can serve a broader range of uses, going beyond the limitations of fixed-task systems.

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Thank you