Real-Time Semantic Computer Vision for Co-Robotics

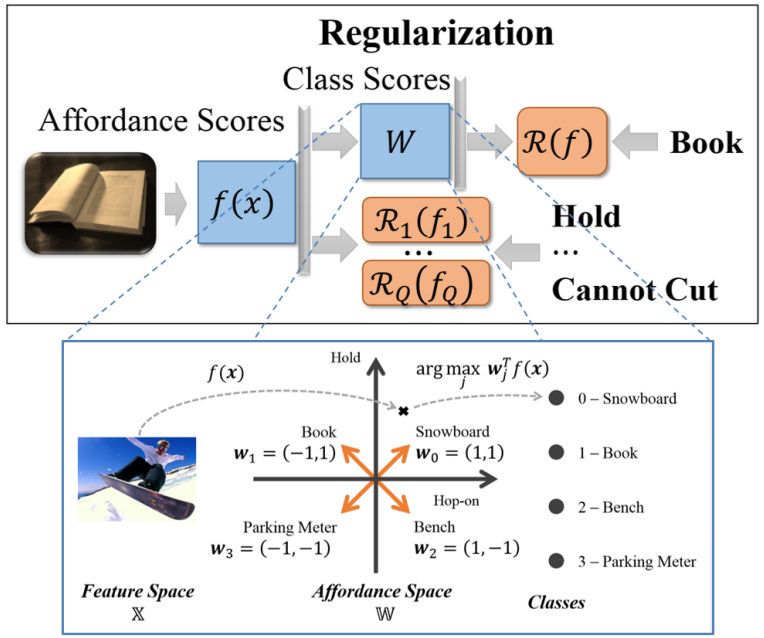
Award # 1637941 / 2016-2020/ Nuno Vasconcelos / UCSD

Challenge

- Transfer of deep learning vision models in real time applications, such as autonomous driving

Solution

- New structural and loss-based approaches to regularization of deep learning models



Scientific Impact

- Broadly applicable to AI methods based on deep learning (NLP, robotics, etc).

Broader Impact

- 15 papers in CVPR/NIPS etc.
- New datasets (OOWL - Multiview recognition, 360o audio/video, Dive48 - action recognition)
- ENLACE –undergraduate and high-school research

Bidirectional Learning for Domain Adaptation of Segmentation

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Challenge

- Segmenting real video with automatically labeled synthetic data and unlabeled real data, where big domain gap exists

Solution

- Bidirectional learning to gradually decrease the domain gap
- Self-training to further improve the adaptation performance

Scientific Impact

- State-of-the-art adaptive segmentation model
- Model learned with only labeled synthetic data has close performance to one trained on real images.

Broader Impact

- Faster training of deep learning models
- Applicable to many problems of interest to robotics