

Abstract

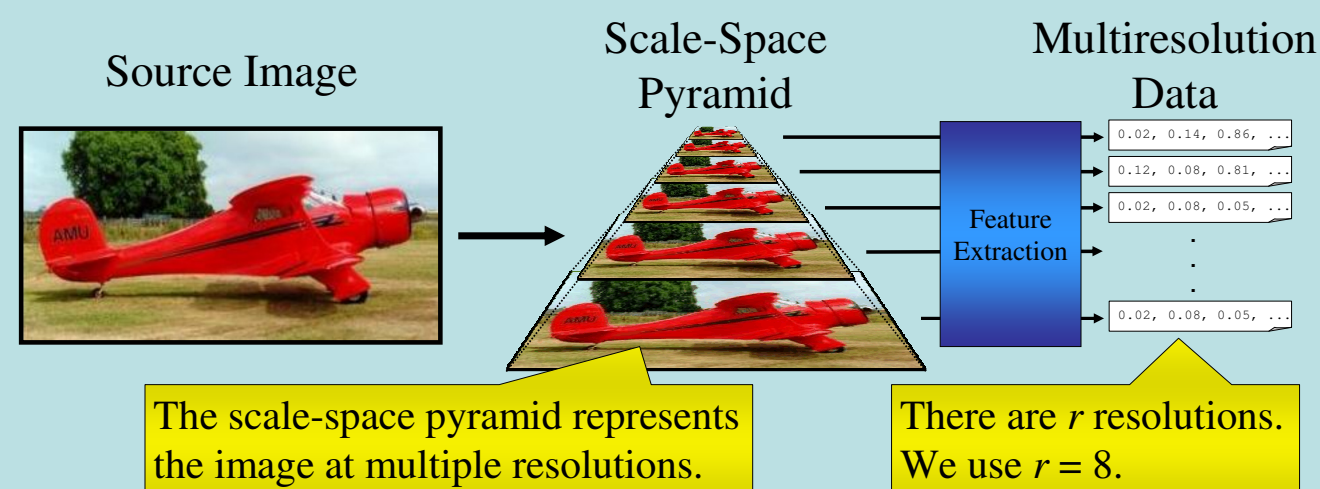
Our work explores the transfer of knowledge at multiple levels of abstraction to improve learning. By exploiting the similarities between objects at various levels of detail, multiresolution learning can facilitate transfer between image classification tasks.

We extract features from images at multiple levels of resolution, then use these features to create models at different resolutions. Upon receiving a new task, the closest-matching stored model can be generalized (adapted to the appropriate resolution) and transferred to the new task.

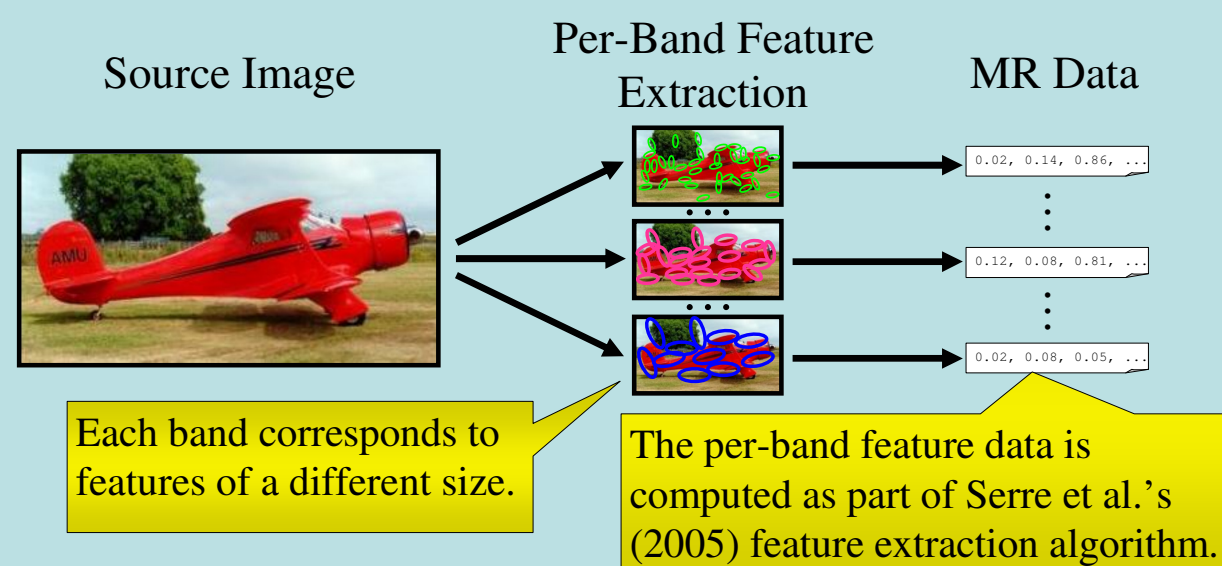
Main Idea

- Related objects have features that appear similar at lower resolutions.
- Low-resolution knowledge can transfer to related objects.
- High-resolution knowledge helps to differentiate between objects.

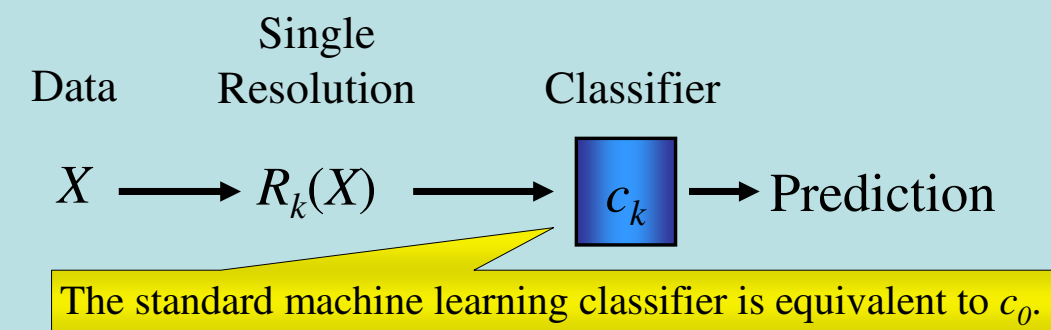
Multi-scale Feature Extraction



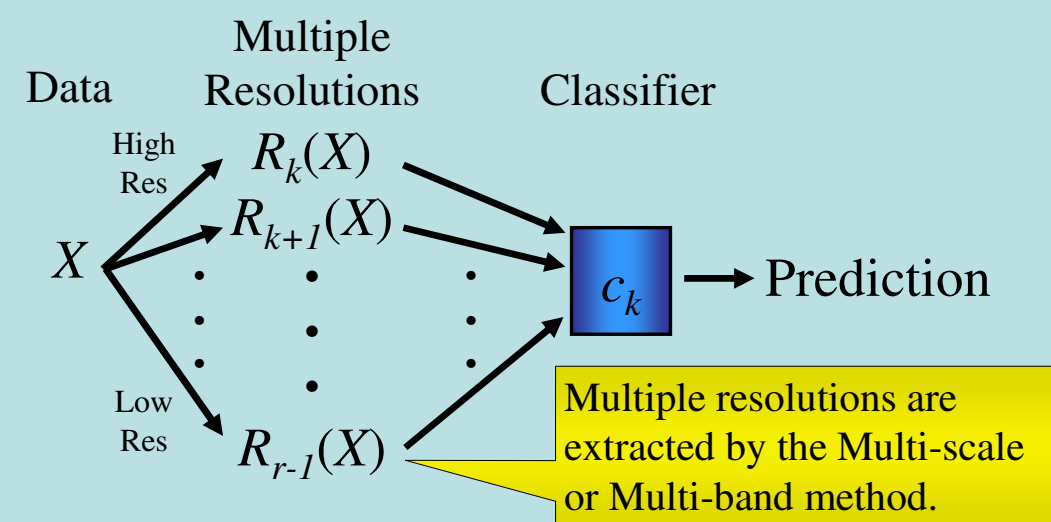
Multi-band Feature Extraction



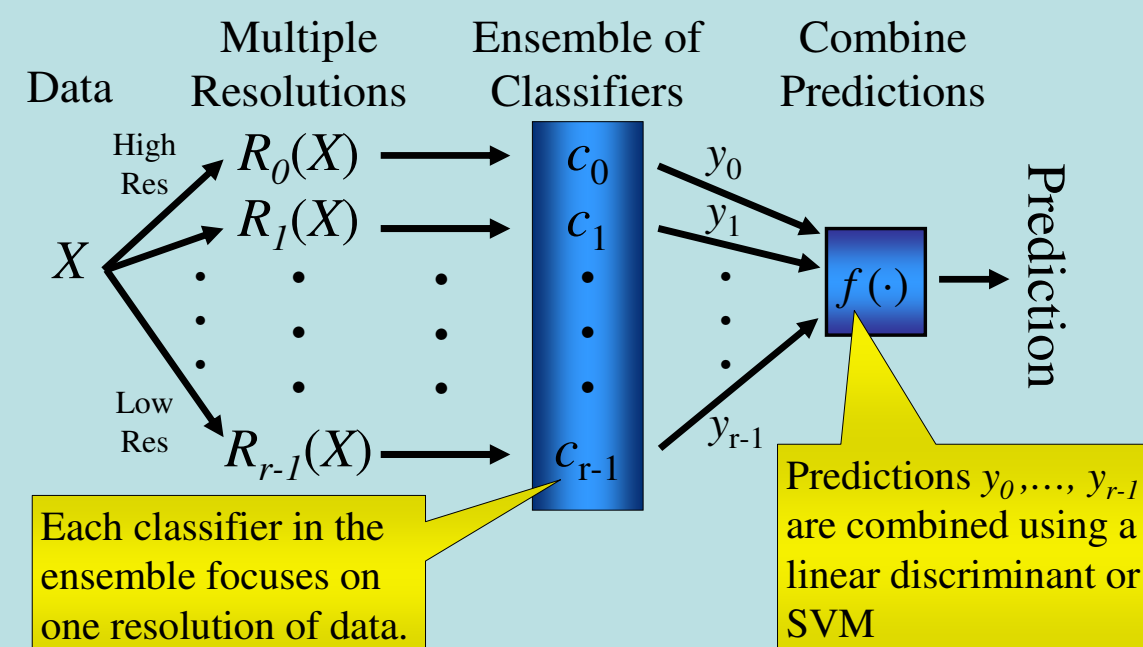
The Single-Resolution Classifier



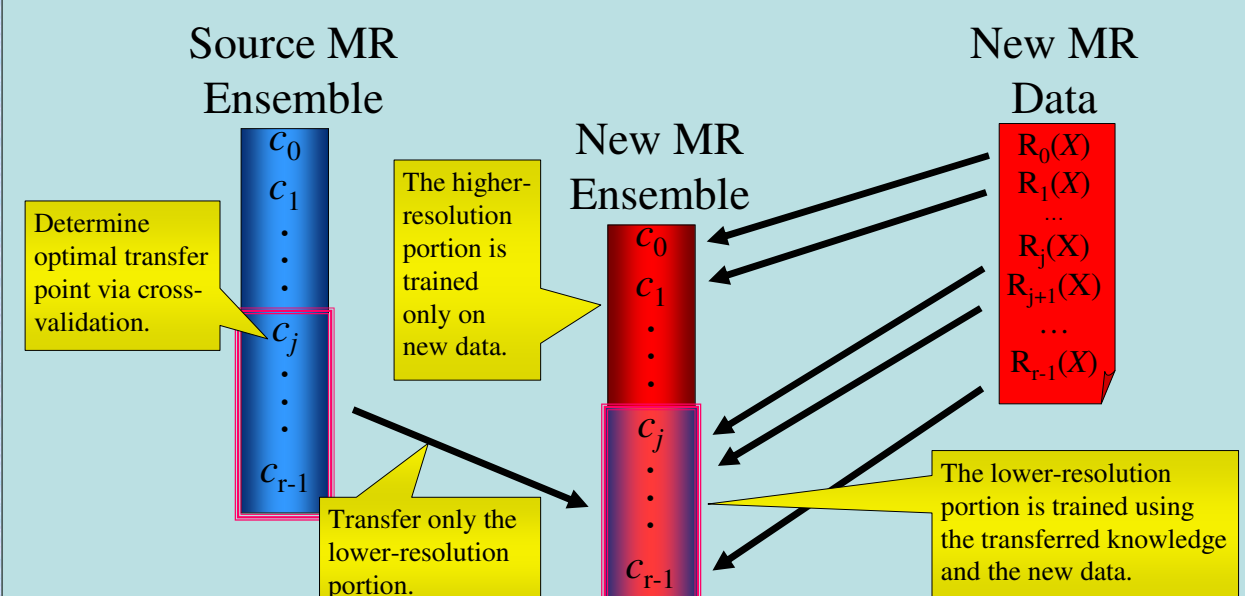
The Multiresolution Classifier



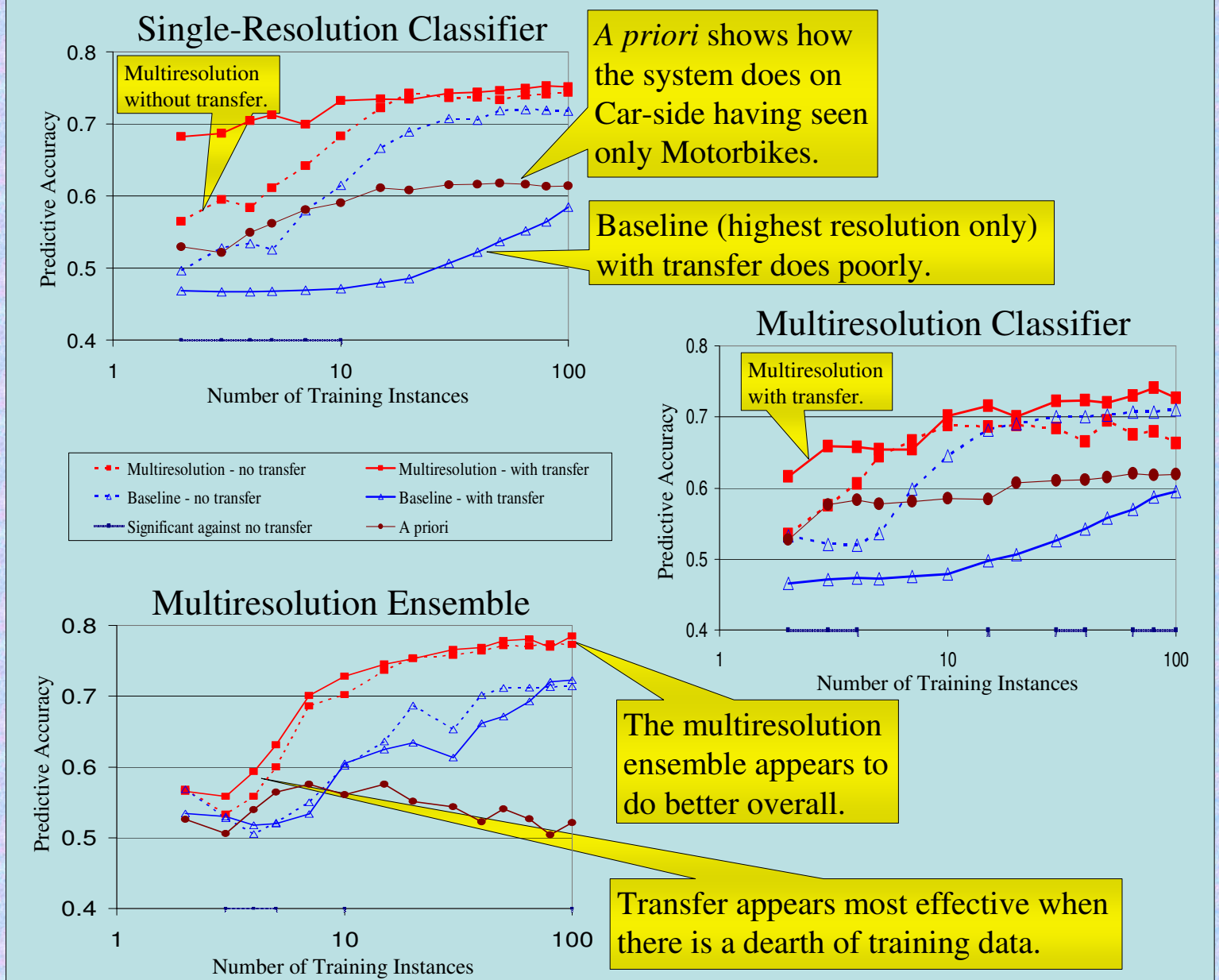
The Multiresolution Ensemble



Transfer with the MR Ensemble



Results on the Caltech Image Datasets: Transfer from Motorbikes to Car-side using Multi-band



References

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