Filtering Wavelet Subspaces for Recognition

Correlation can be a powerful pattern recognition tool for images, but it does not have to be limited to image intensities. It may also be applied to image texture features, meaning features that carry local spatial frequency information. A wavelet decomposition divides an image into subspaces (or subbands) that contain these types of features, which may be more useful for recognition than just pixel intensities. In this project, we search for the wavelet subspaces that best facilitate correlation filter recognition. Then we design filters to be applied directly in these subspaces. Tests with fingerprint images show that these types of subspace correlation filters can be significantly more accurate than image-intensity correlation filters. We plan to investigate other types of wavelet decomposition to examine their effect on accuracy and shift invariance.