Bag of Visual Words (BoVW)
Bags of features: Motivation

- Orderless document representation: frequencies of words from a dictionary  
  Salton & McGill (1983)
Bags of features: Motivation

- Orderless document representation: frequencies of words from a dictionary  
  Salton & McGill (1983)
Bags of features: Motivation

- Orderless document representation: frequencies of words from a dictionary  
  Salton & McGill (1983)
Bags of features
Traditional features: Bags-of-features

1. Extract local features
2. Learn “visual vocabulary”
3. Quantize local features using visual vocabulary
4. Represent images by frequencies of “visual words”
Example visual vocabulary

Source: B. Leibe
Texture recognition

1. Local feature extraction

- Sample patches and extract descriptors
Keypoints

patches surrounding keypoints
2. Learning the visual vocabulary

Extracted descriptors from the training set

patches surrounding keypoints

Slide credit: Josef Sivic except for the image patches
2. Learning the visual vocabulary
2. Learning the visual vocabulary
1. Extract local features
2. Learn “visual vocabulary”
3. Quantize local features using visual vocabulary
4. Represent images by frequencies of “visual words”