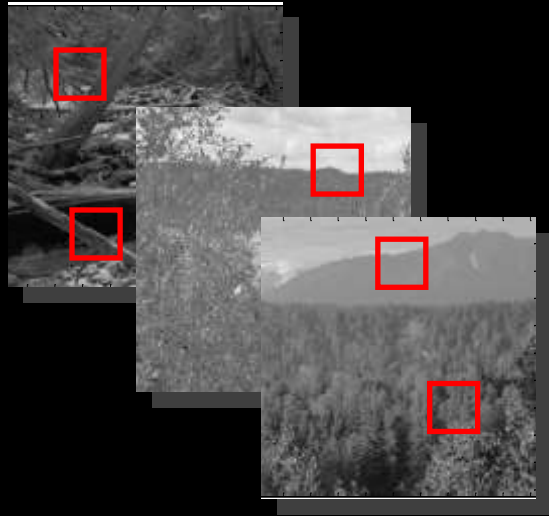# Sparse coding illustration
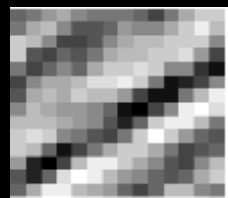
Natural Images

Learned bases ($\phi_1, ..., \phi_{64}$): "Edges"
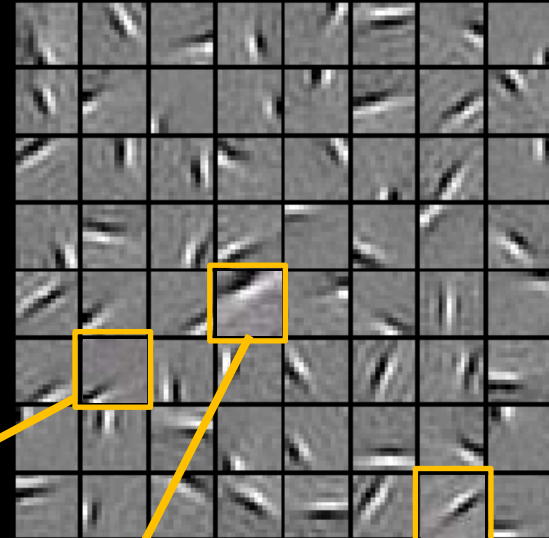


Test example
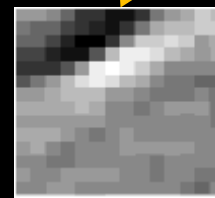


$x \quad \approx 0.8 * \quad \phi_{36} \quad + 0.3 * \quad \phi_{42} \quad + 0.5 * \quad \phi_{63}$

$[a_1, ..., a_{64}] = [0, 0, ..., 0, \mathbf{0.8}, 0, ..., 0, \mathbf{0.3}, 0, ..., 0, \mathbf{0.5}, 0]$

(feature representation)

More succinct, higher-level, representation.