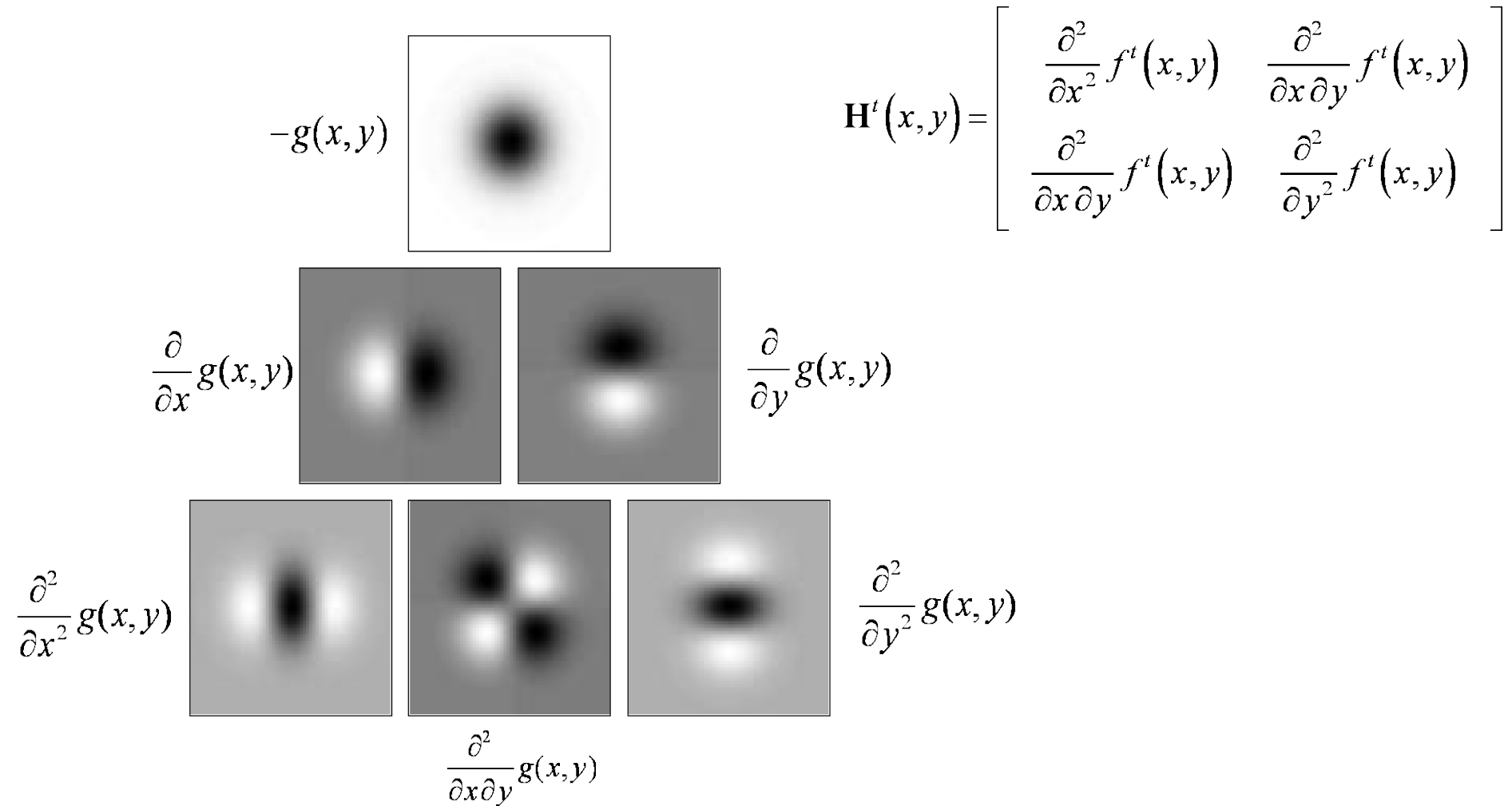
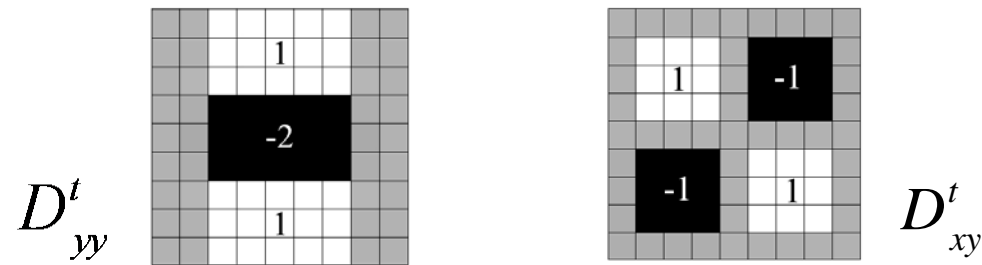


Hessian keypoints in scale space



SURF keypoint detection

- SURF – Speeded Up Robust Features [*Bay, Tuytelaars, Van Gool, ECCV 2006*]
- No subsampling – all resolution levels at full spatial resolution
- Simple approximation of scale space Gaussian derivatives using integral images



- Determinant of Hessian

$$\det(\mathbf{H}^t) \approx D^t_{xx} D^t_{yy} - \left(0.9 D^t_{xy}\right)^2$$

- Non-maximum suppression in 3x3x3 $[x, y, t]$ neighborhood
- Interpolation of maximum of $\det(\mathbf{H})$ in image space x, y and scale t

SURF keypoints



SIFT keypoints



SURF keypoints



SIFT keypoints

