

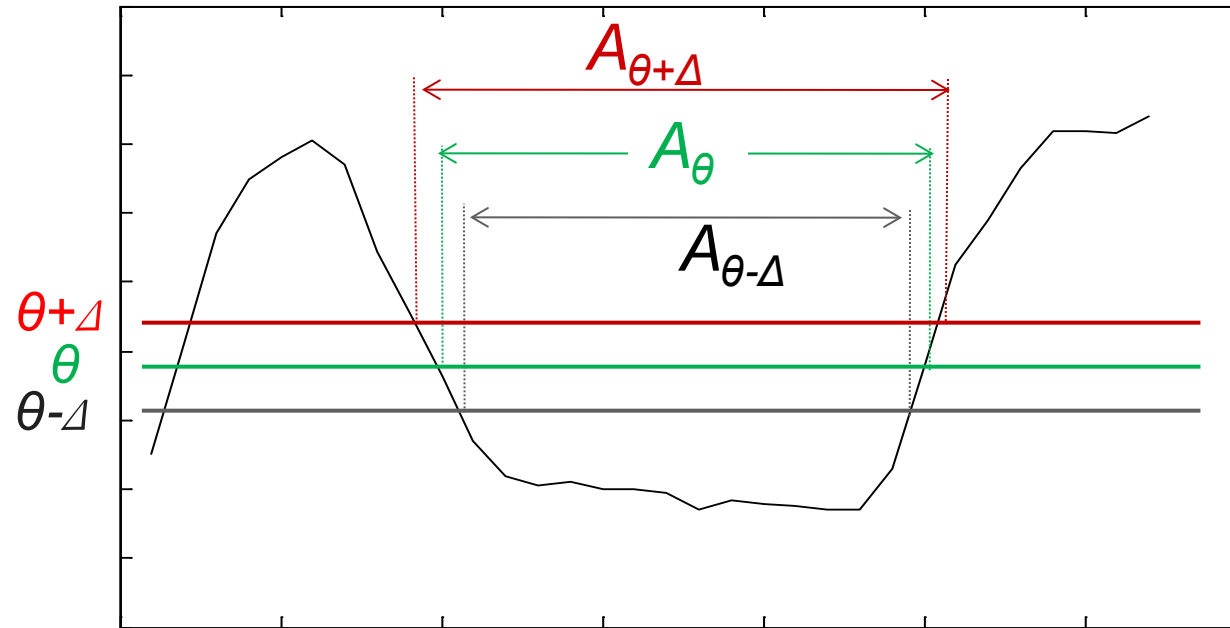
Maximally stable extremal regions

- Extremal region: any connected region in an image with all pixel values above (or below) a threshold
- Observations:
 - Nested extremal regions result when the threshold is successively raised (or lowered).
 - The nested extremal regions form a “component tree.”
- Key idea: choose thresholds θ such that the resulting bright (or dark) extremal regions are nearly constant when these thresholds are perturbed by $\pm\Delta$

→ “*maximally stable*” extremal regions (MSER)

[Matas, Chum, Urba, Pajdla, 2002]

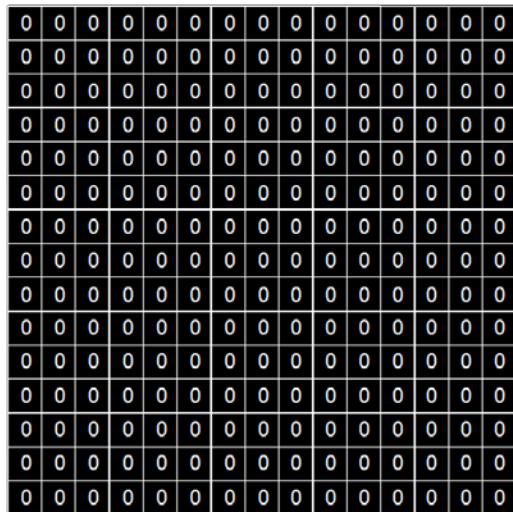
MSEs: illustration



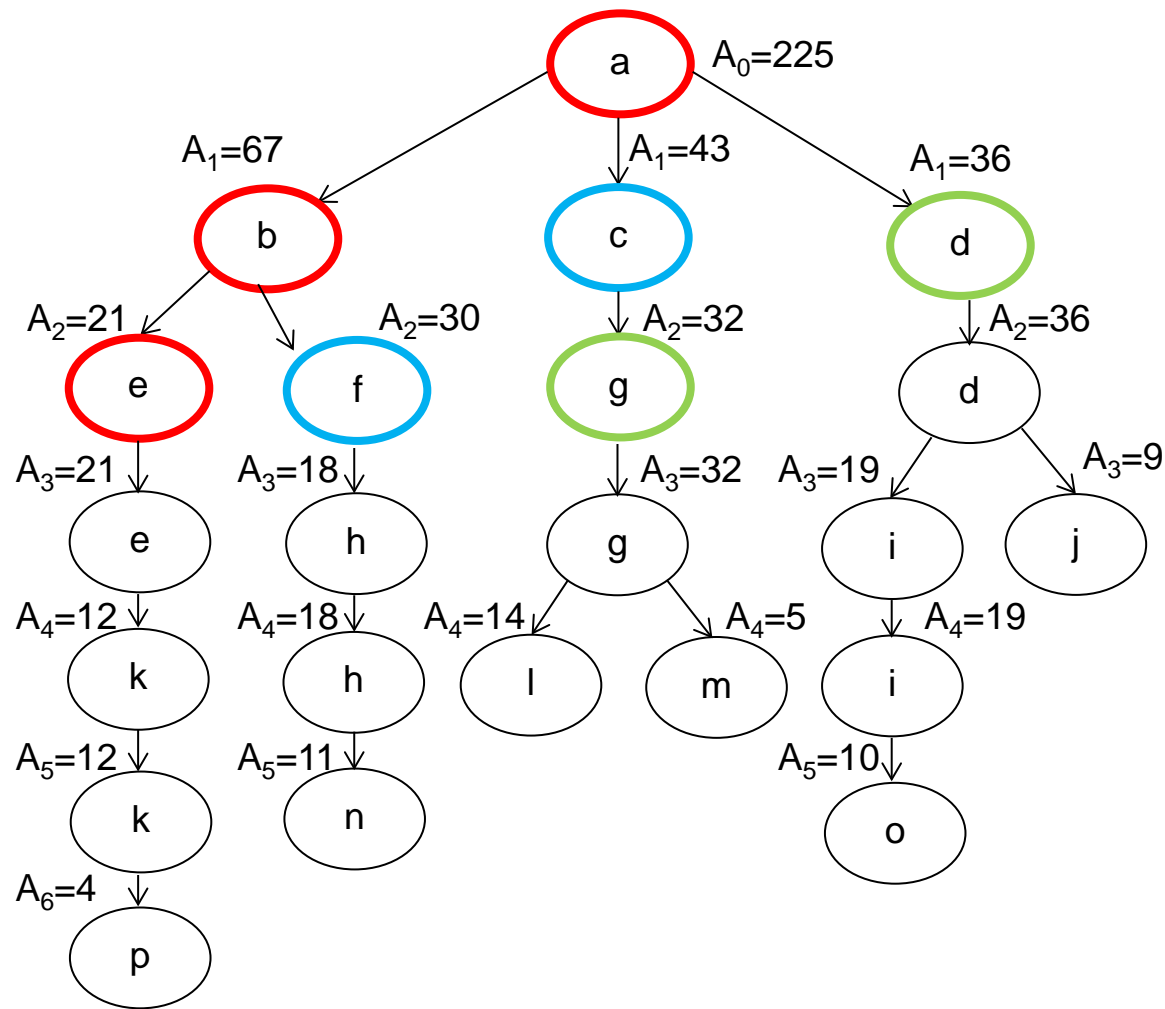
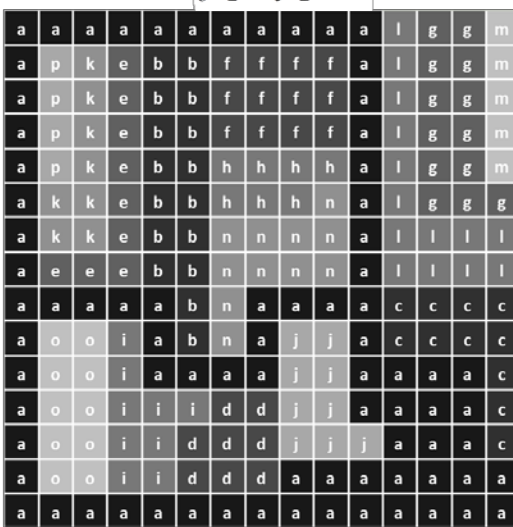
Local minimum of $\left| \frac{A_{\theta-\Delta} - A_{\theta+\Delta}}{A_{\theta}} \right| \rightarrow \text{MSER}$

[Matas, Chum, Urba, Pajdla, 2002]

Component tree of an image



$f[x, y] > 8$



Local minima of sequence

$$\left| \frac{A_{\theta-\Delta} - A_{\theta+\Delta}}{A_{\theta}} \right|$$

$\theta = \Delta, \Delta + 1, K \rightarrow$ MSERs

MSER: examples



Dark MSERs, $\Delta=15$



Original image



Bright MSERs, $\Delta=15$

MSER: examples



Dark MSERs, $\Delta=15$



Original image



Bright MSERs, $\Delta=15$