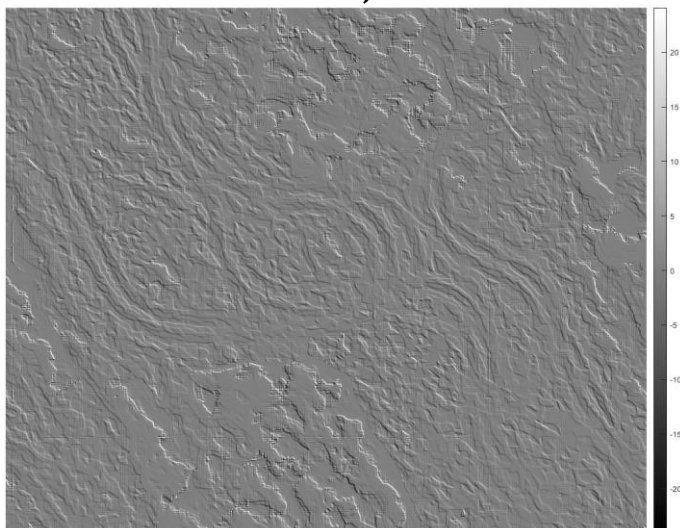
Ojanpohjien luotaussuunnitelma

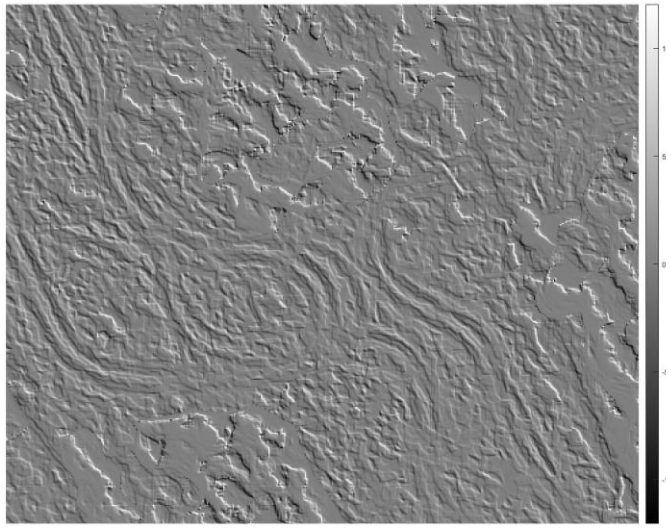
UTU, Paavo N., helmi-2021

Pikselien poisto → $\delta = 0.03\,m$ … $0.26\,m$

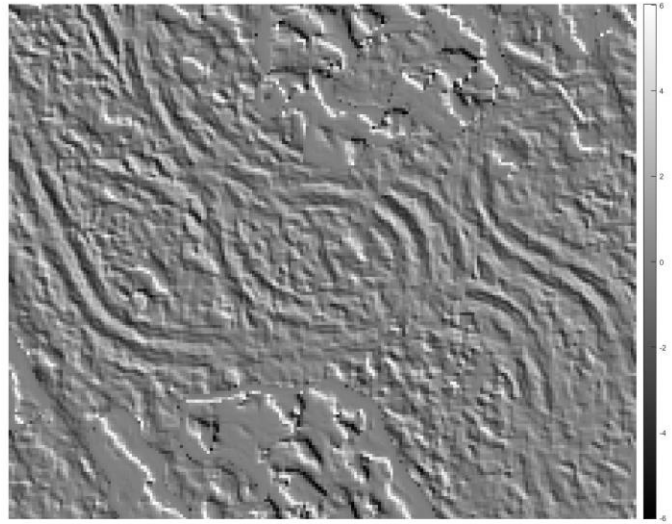
$\delta = 0.032, \alpha = -45^o$

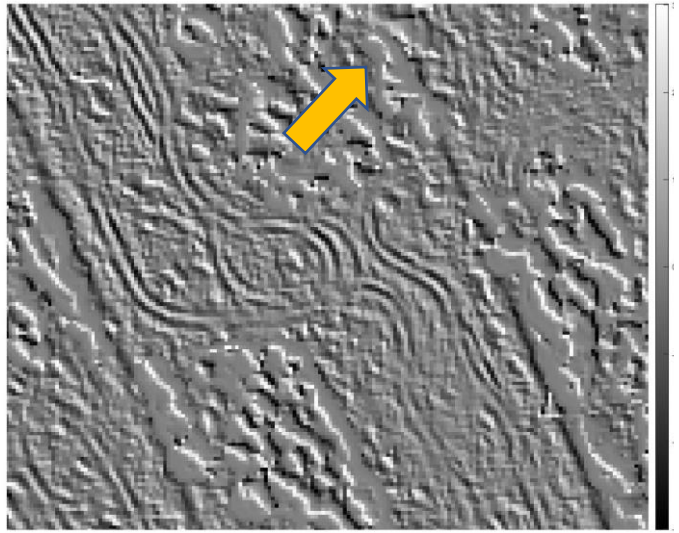


$\delta = 0.067, \alpha = -45^o$

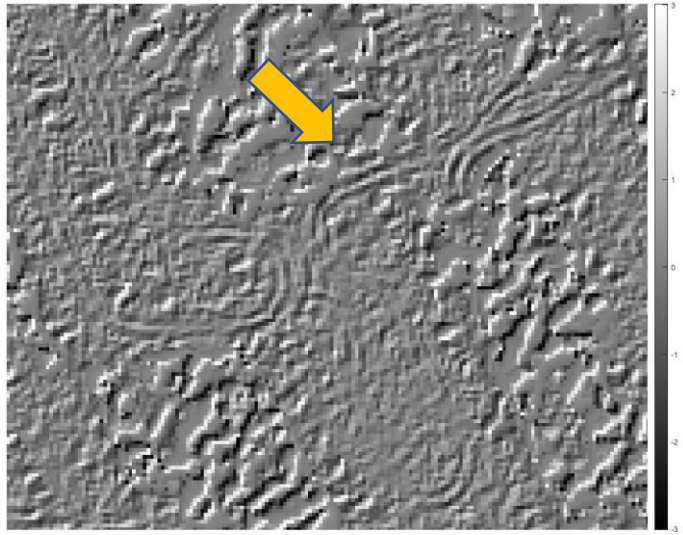


$\delta = 0.13, \alpha = -45^o$

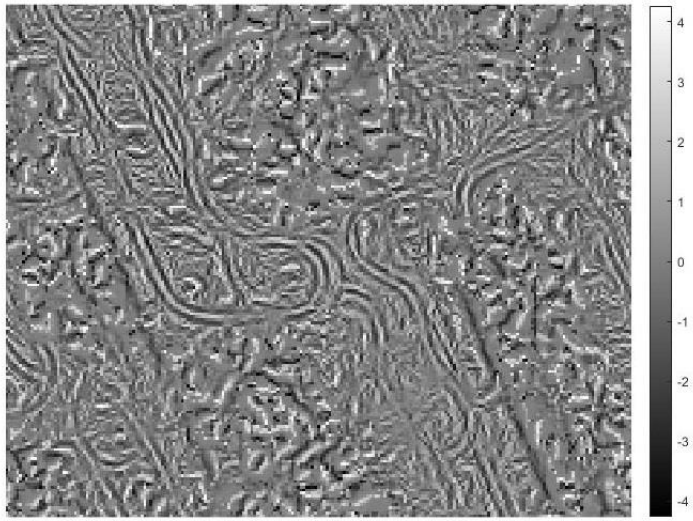




$\delta = 0.26, \alpha = -45^o$

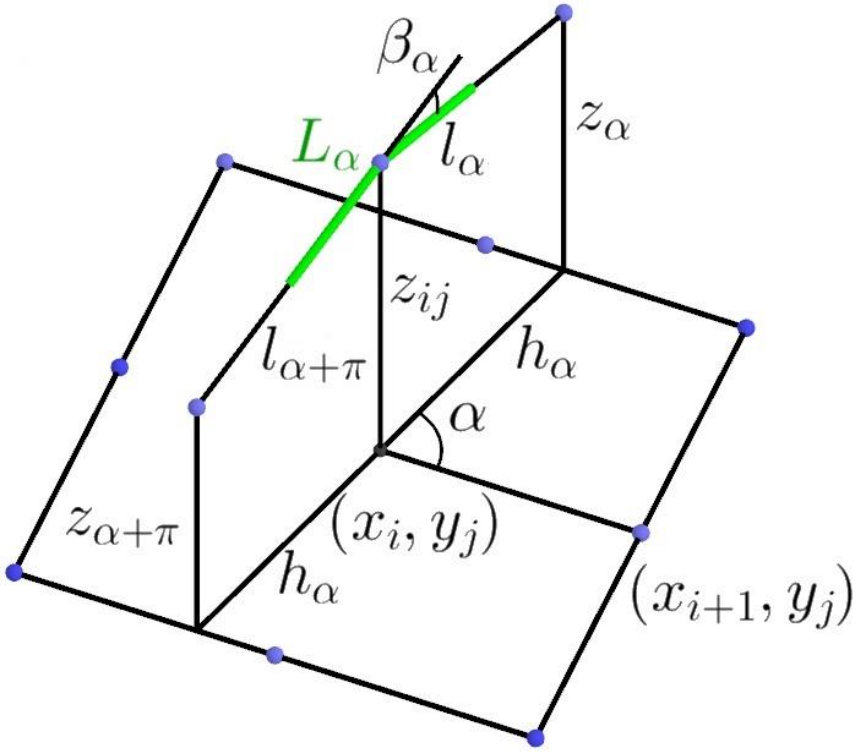


$\delta = 0.26, \alpha = +45^o$



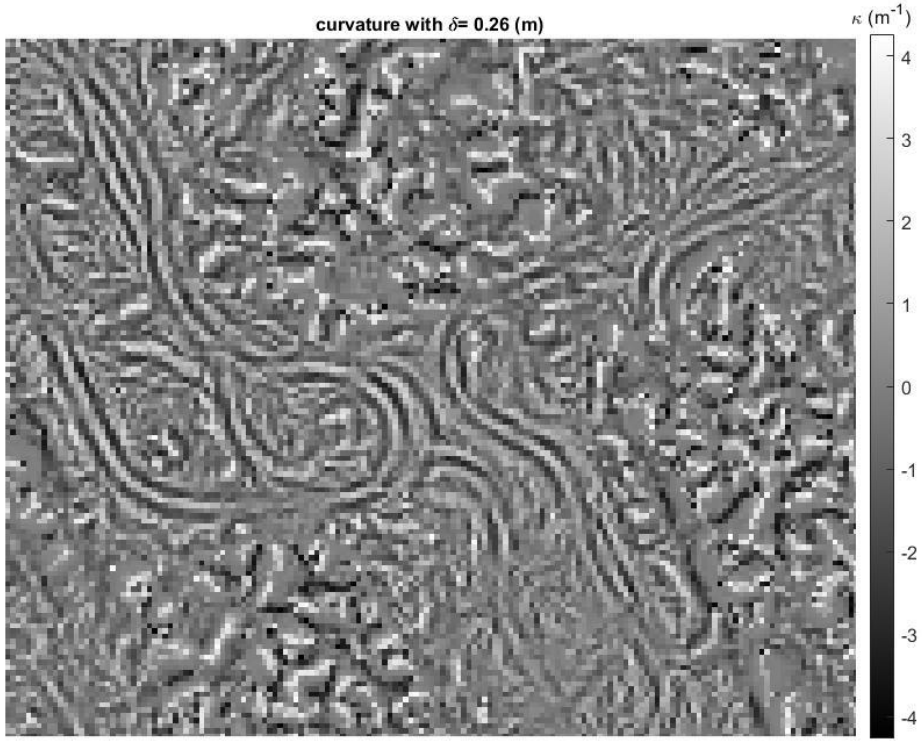
$\delta = 0.26, \alpha = 0, 90, \pm 45^o$

Suunnattu kaarevuus



$\kappa_\alpha(p) = \frac{\beta(\alpha)}{L_\alpha},\ L_\alpha = (l_\alpha + l_{\alpha+\pi})/2$, β_α: suunnan muutos pisteessä *p*

9x9 –ikkunan entropian minimi valitsee kaarevuuspikselin kuvista I_α (sillä kohtaa ”informatiivisimman” kaarevuuskuvan tieto valitaan)

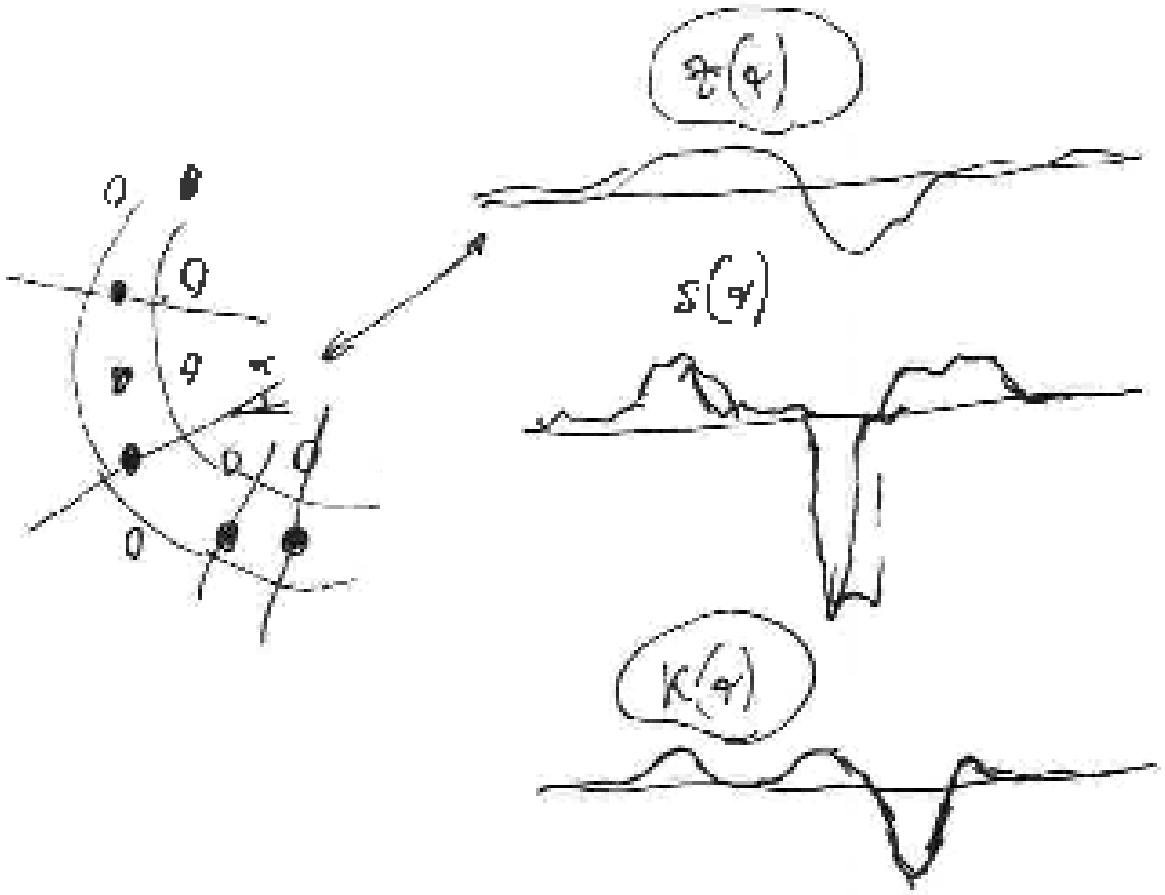


$\delta = 0.26$ m, $\alpha = 0, 30, 60, 90, 120, 150^o$

A proposal for harvester ruts (and for forest dikes)

- $5\ \mathrm{m}^{-2}$ point cloud → TIN with scale regularization [1] or information theoretic regularization → ground surface height raster with a variable raster constant δ
- $\delta \approx 0.4$ m (approx 3 pixels per rut width) and 6 directions for
  - directed curvature and directed slope
  - image completion even the sparse sampling used
- Minimum entropy [1] decides the direction at each pixel →
  - directional height profile, slope profile, curvature profile
- CNN to register ruts (or forest dikes) in another project?
- Height, slope and curvature all used to estimate the depth and profile

A proposal for harvester ruts (and for forest dikes)



- $\kappa(\alpha)$ usually good for this kind of detection, since $\mathrm{mean}_{\mathrm{crosslength}}\ \kappa(\alpha) \approx 0$
- $(z, s, \kappa)(\mathrm{ditch\ length})$ are a good candidate for clustering
- $(z, s, \kappa)(\mathrm{ditch\ length})$ mapping learned afterwards by CNN