

Radiometrisk kalibrering af ortofoto

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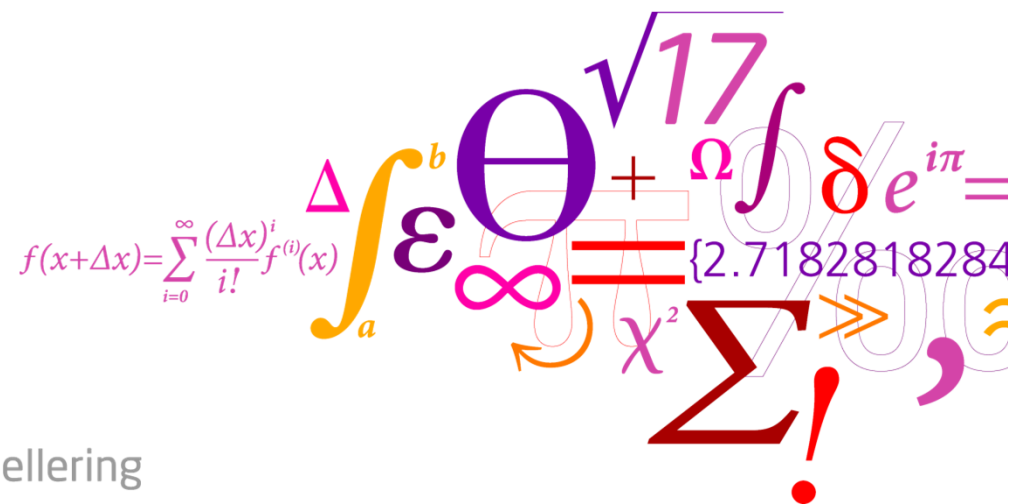
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Jacob Schack Vestergaard

Brian Pilemann Olsen, KMS

Afhandling af: (Præliminær version)

Anders Thirsgaard Rasmussen



DTU Informatik

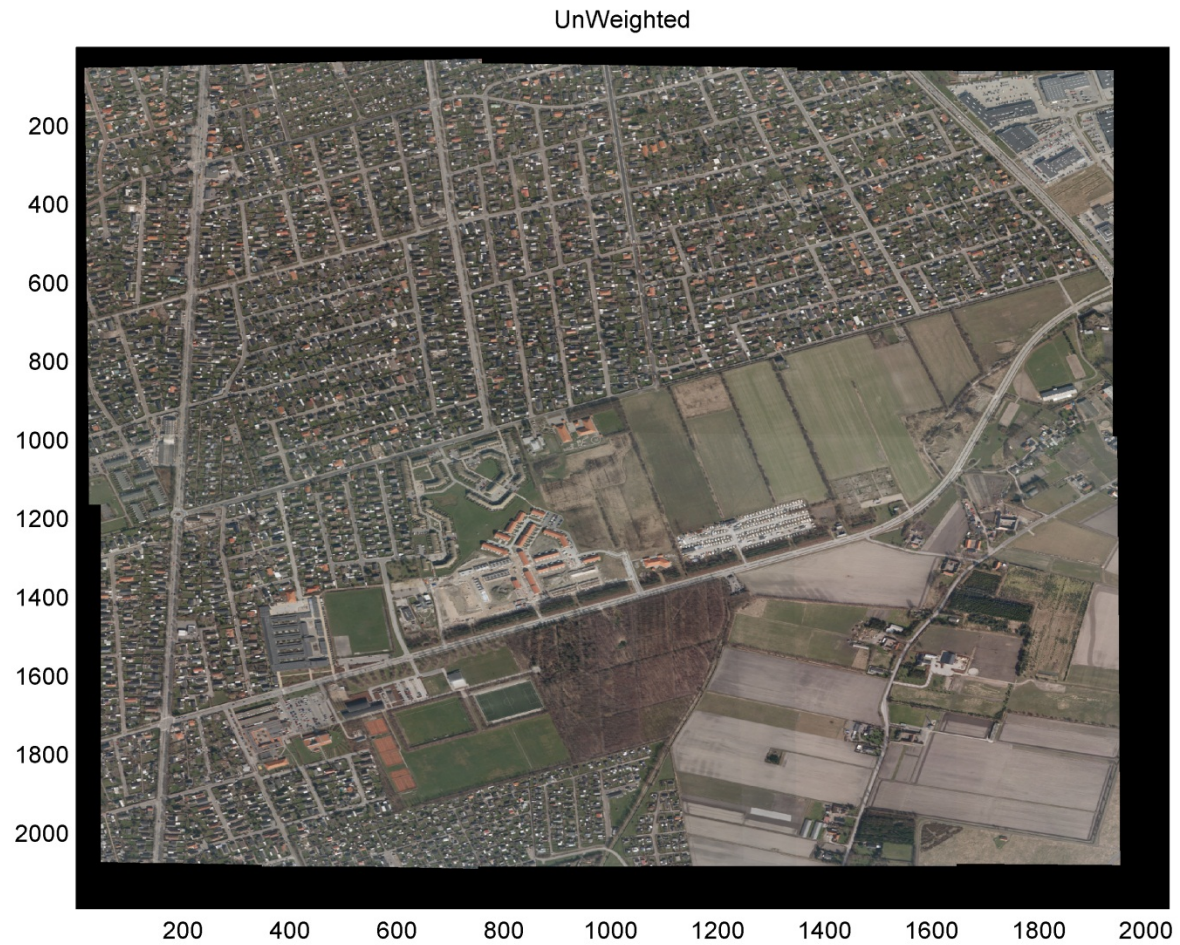
Institut for Informatik og Matematisk Modellering

Radiometrisk kalibrering/styring er et problem i ortofoto produktion

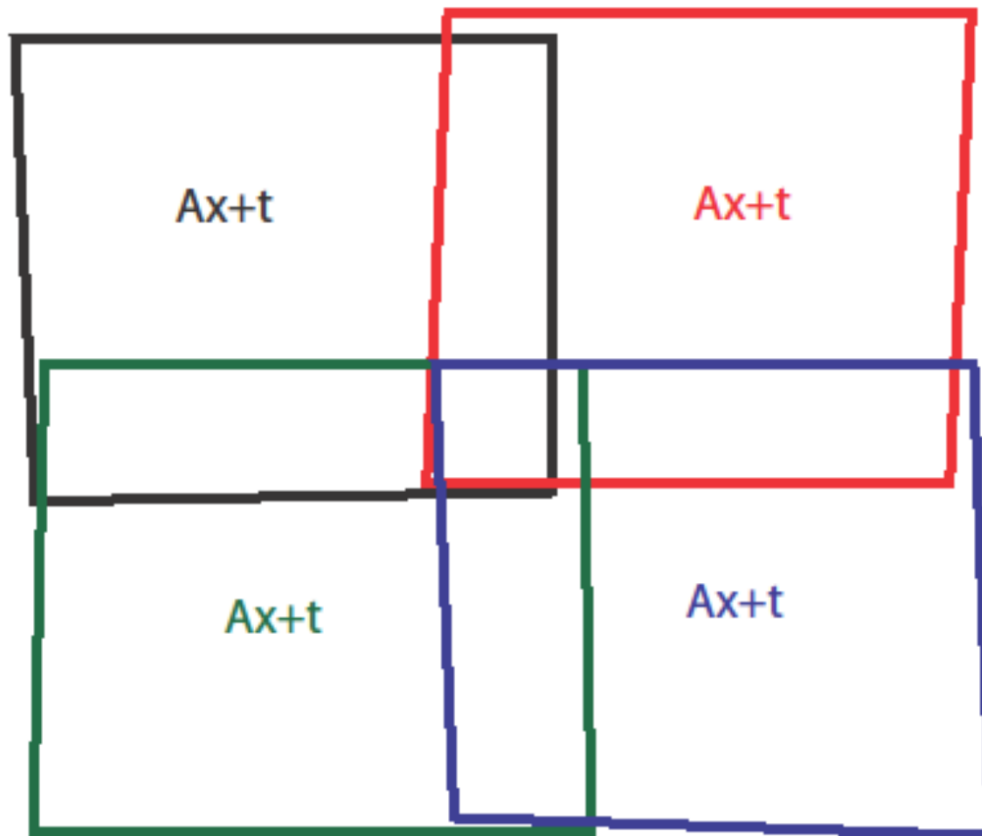
'Klares' typisk med lokale metoder så som feathering.

Her foreslår vi en metode til global radiometrisk kalibrering, i stil med stråle udjævning.

Abstract problem



Abstract problem



Langt større net

Formel apparat

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \mathbf{A}_i \begin{bmatrix} R \\ G \\ B \end{bmatrix} + \mathbf{t}_i = \mathbf{A}_i \mathbf{x} + t_i$$
$$\min_{\mathbf{A}_i, t_i} \sum_{i,j} \sum_k \|(\mathbf{A}_i \mathbf{x}_k + t_i) - (\mathbf{A}_j \mathbf{x}_k + t_j)\|$$

i, j overlap

Formel apparat

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \mathbf{A}_i \begin{bmatrix} R \\ G \\ B \end{bmatrix} + \mathbf{t}_i = \mathbf{A}_i \mathbf{x} + t_i$$

$$\min_{\mathbf{A}_i, t_i} \sum_{i,j} \sum_k \|(\mathbf{A}_i \mathbf{x}_k + t_i) - (\mathbf{A}_j \mathbf{x}_k + t_j)\| + w \sum_i \|\mathbf{A}_i - \mathbf{I}\|$$

i, j overlap

Før

UnWeighted



Resultat

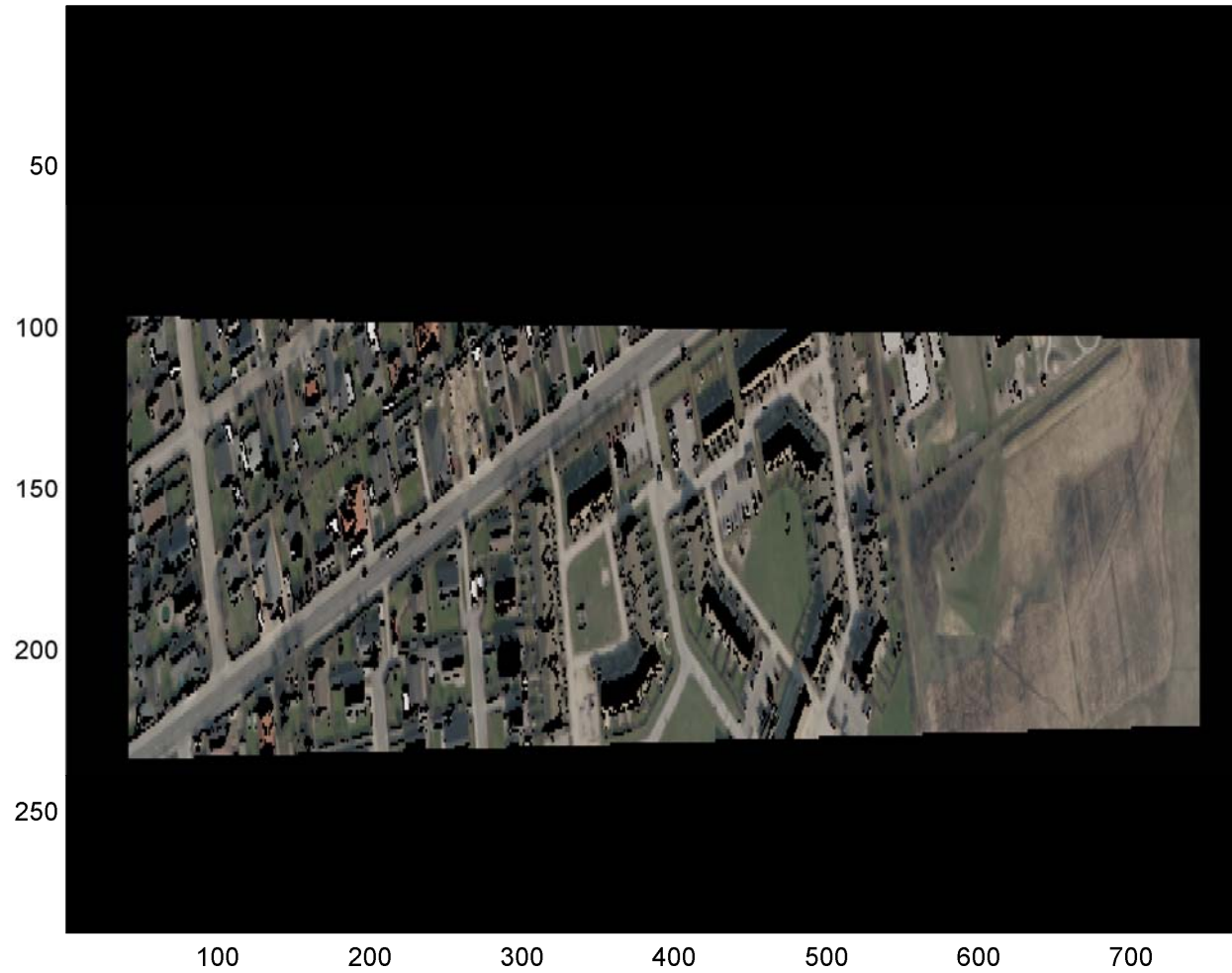
Weighted

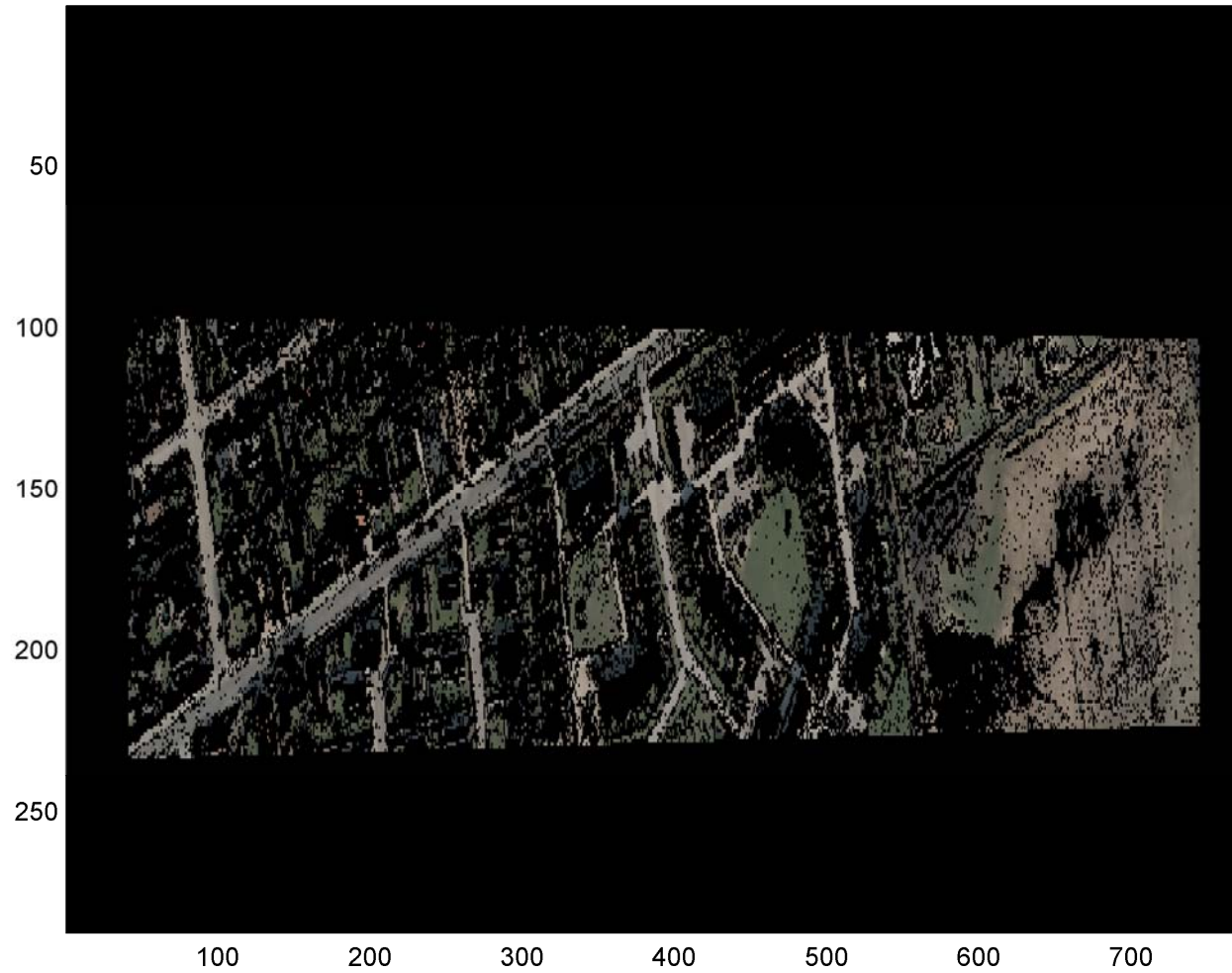


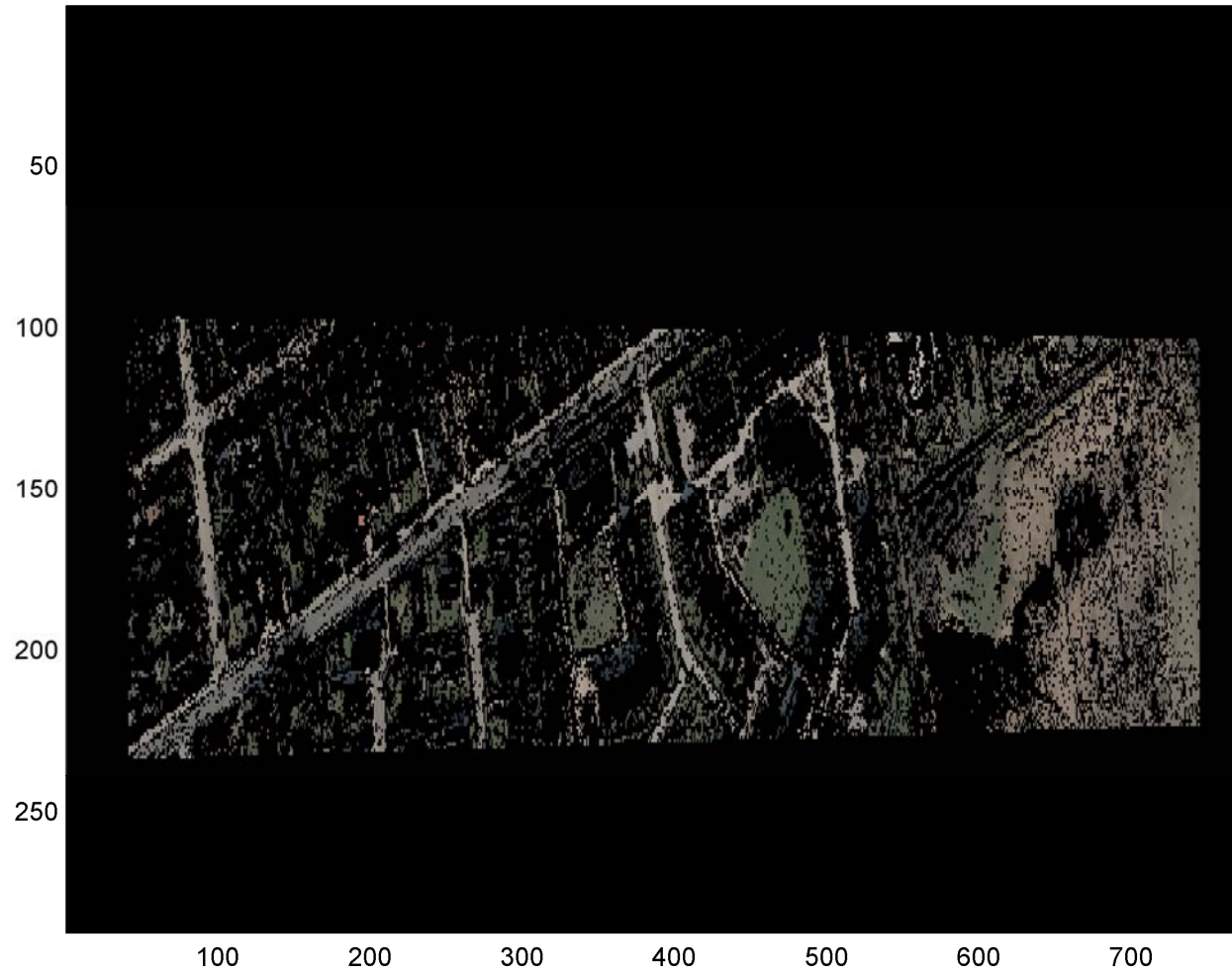
Problem med *ikke ens* pixels

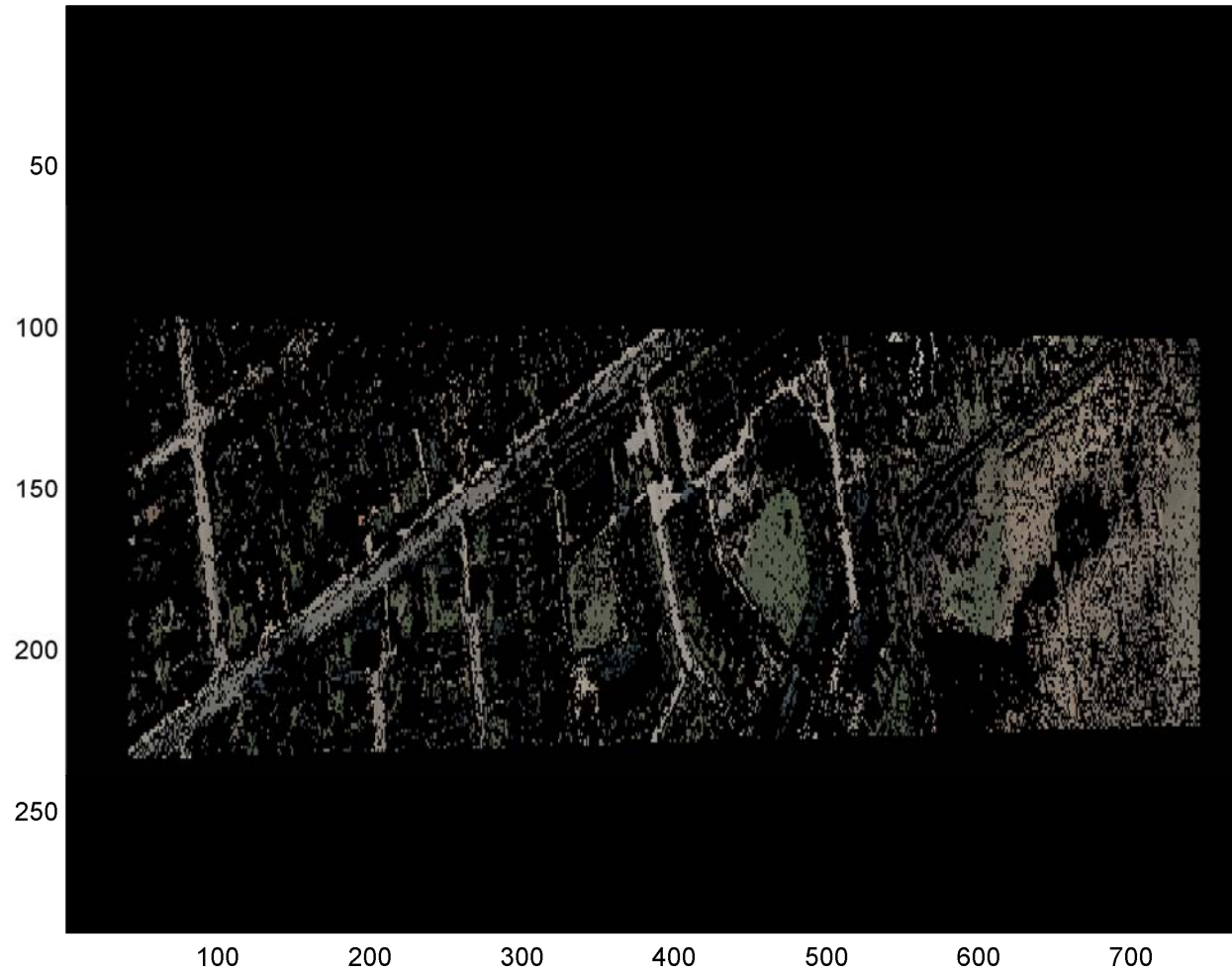
Løsning: Lav statistisk test på om de er ens.

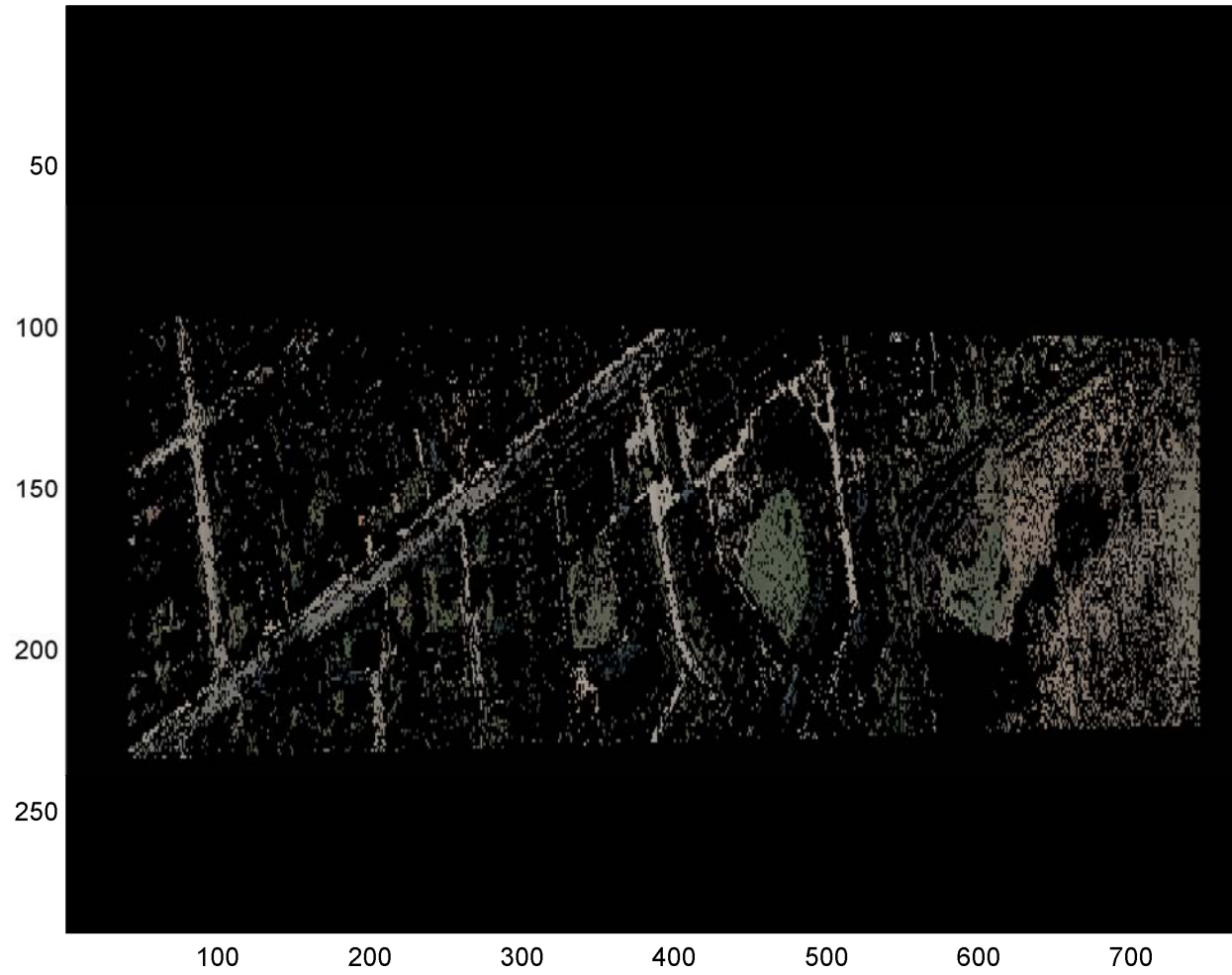


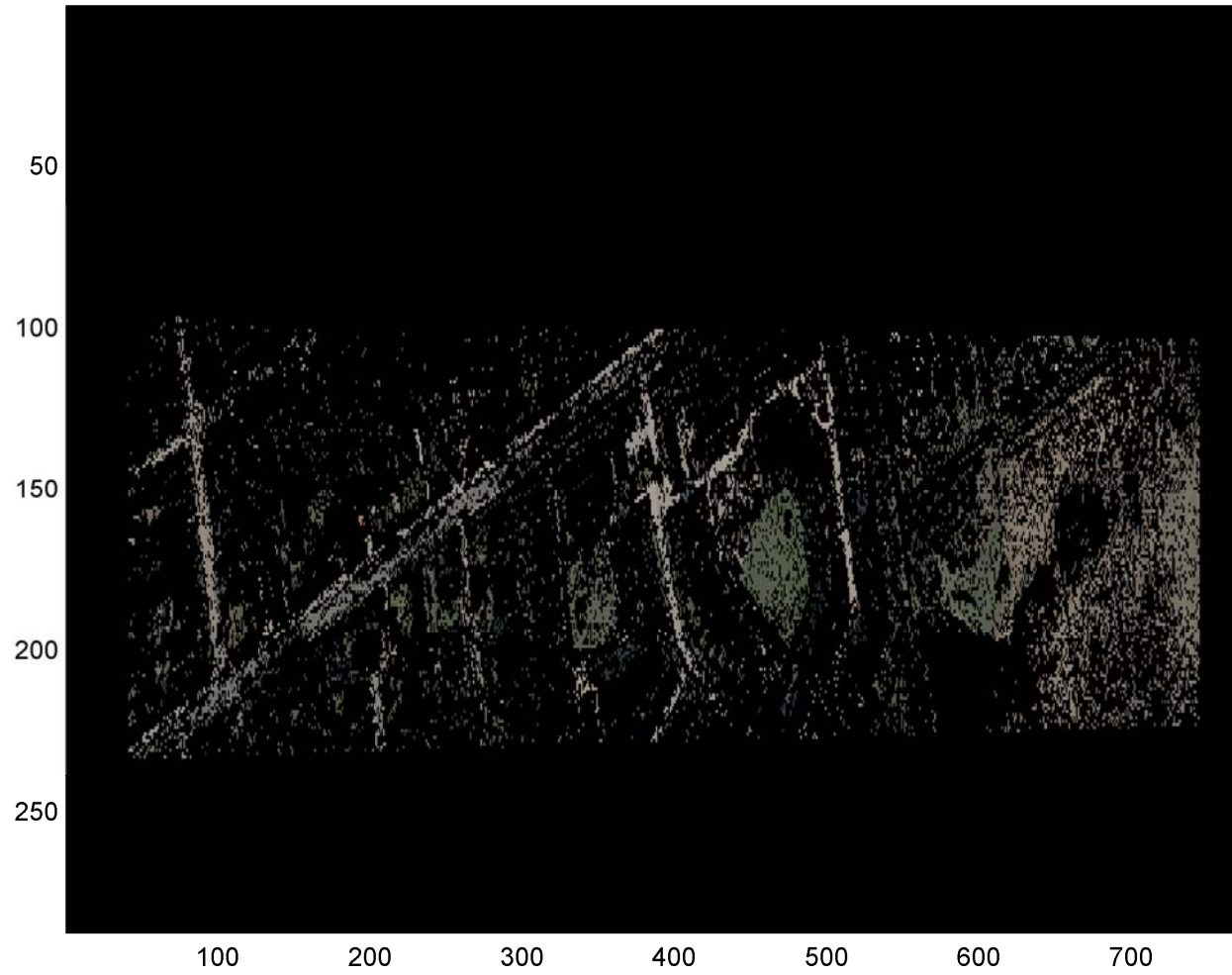


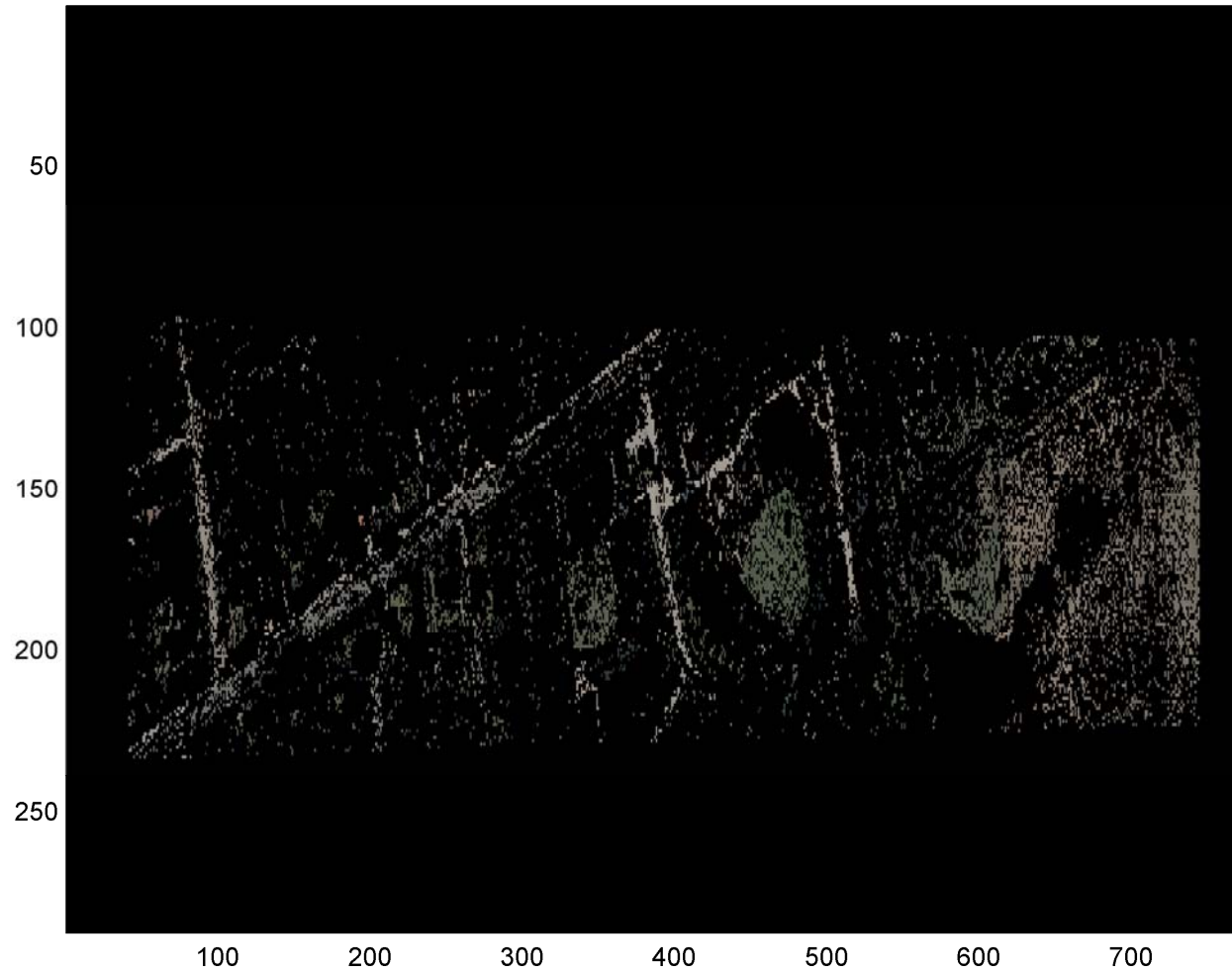


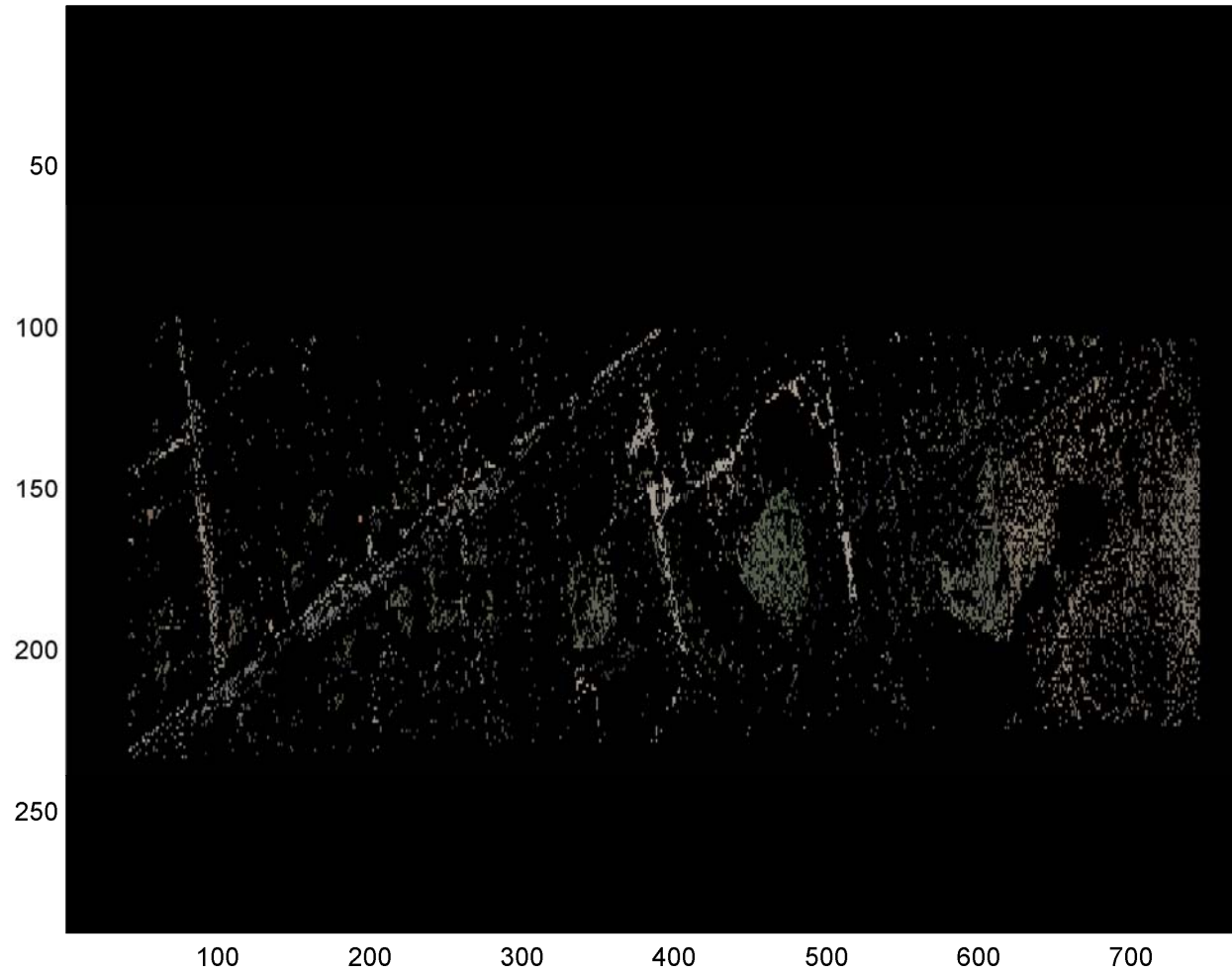


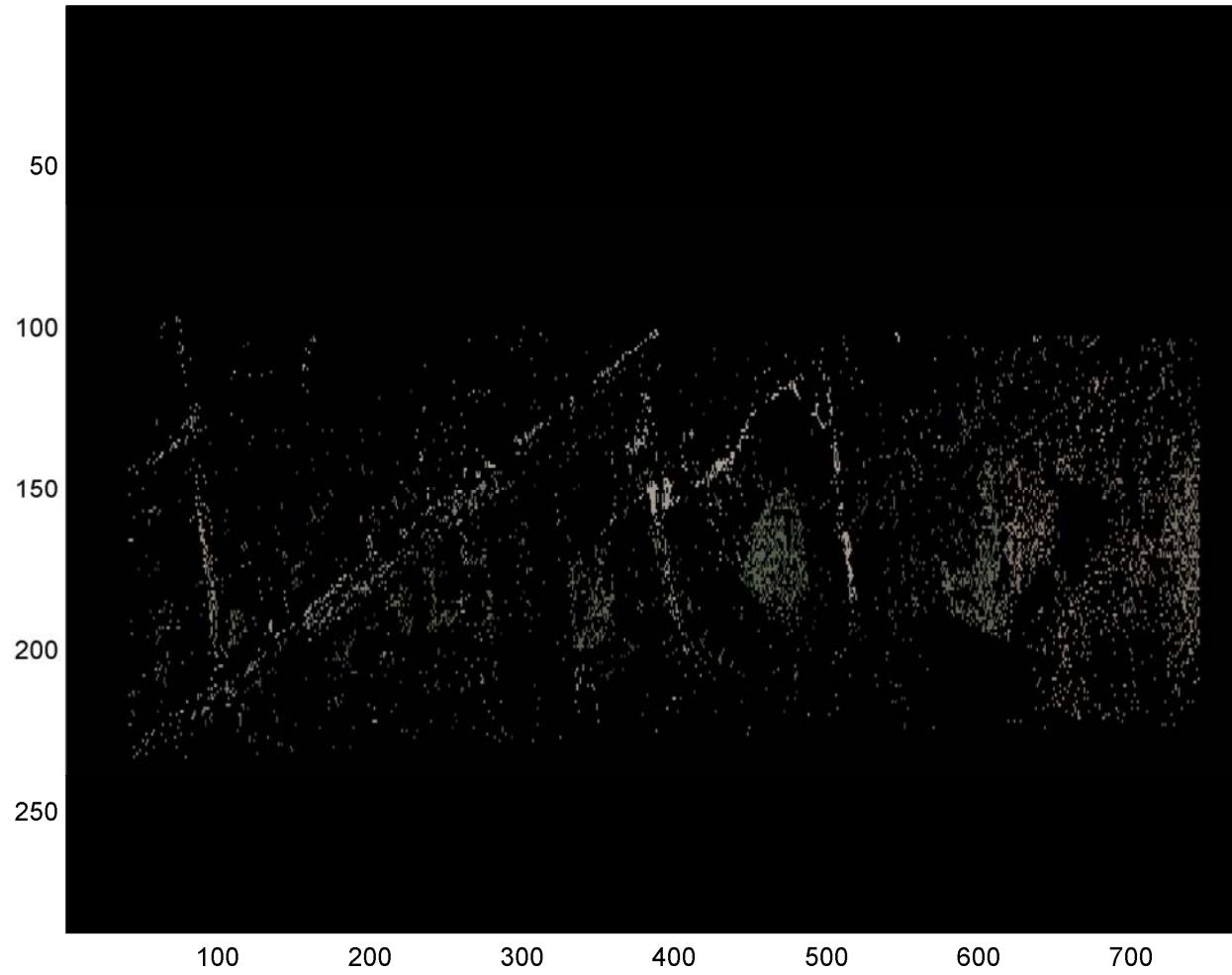


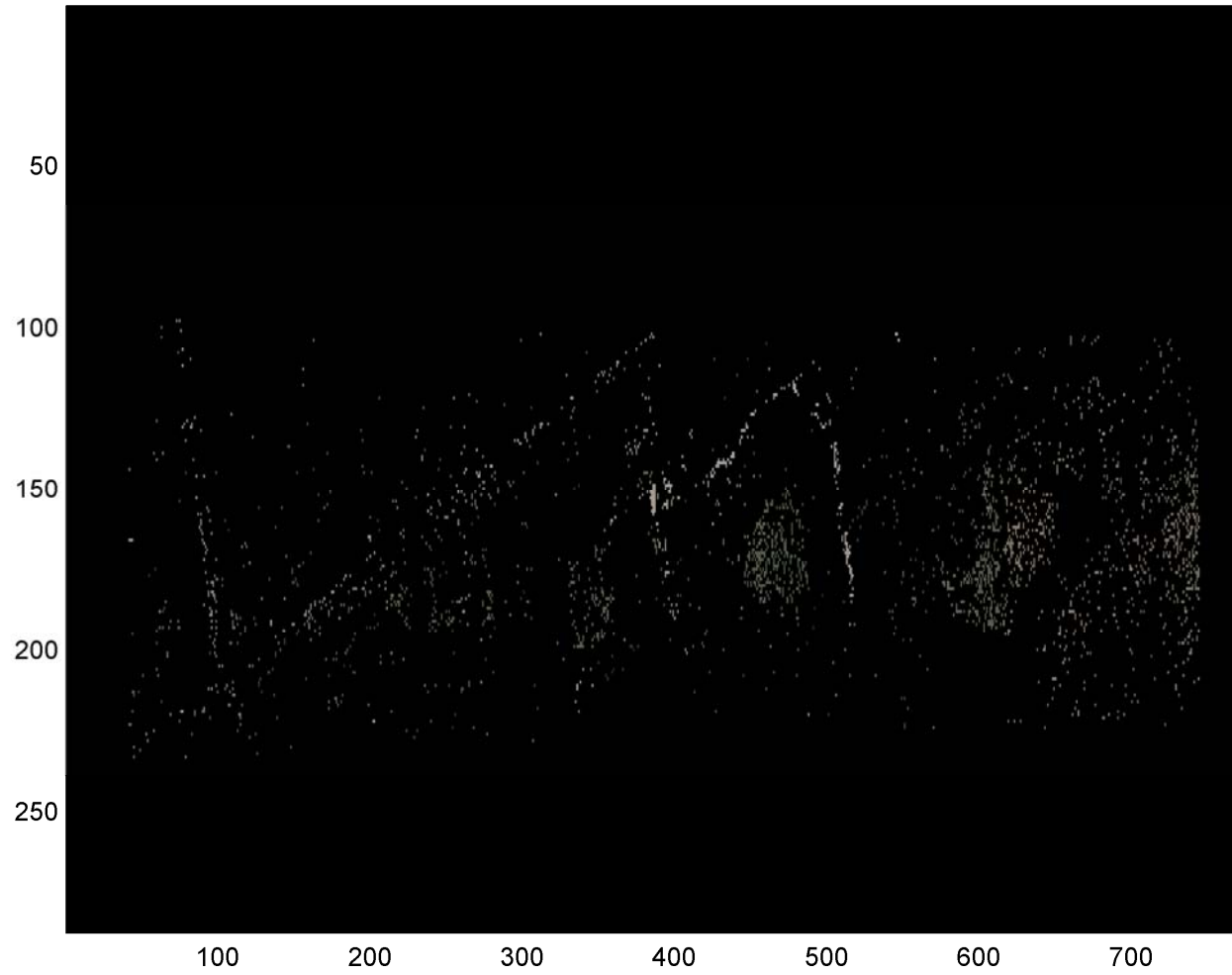












Formel apparat II

$$\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \mathbf{A}_i \begin{bmatrix} R \\ G \\ B \end{bmatrix} + \mathbf{t}_i = \mathbf{A}_i \mathbf{x} + t_i$$

$$\min_{\mathbf{A}_i, t_i} \sum_{i,j} \sum_k \|(\mathbf{A}_i \mathbf{x}_k + t_i) - (\mathbf{A}_j \mathbf{x}_k + t_j)\| + w \sum_i \|\mathbf{A}_i - \mathbf{I}\|$$

i, j overlap

k No – changepixels

Før

UnWeighted

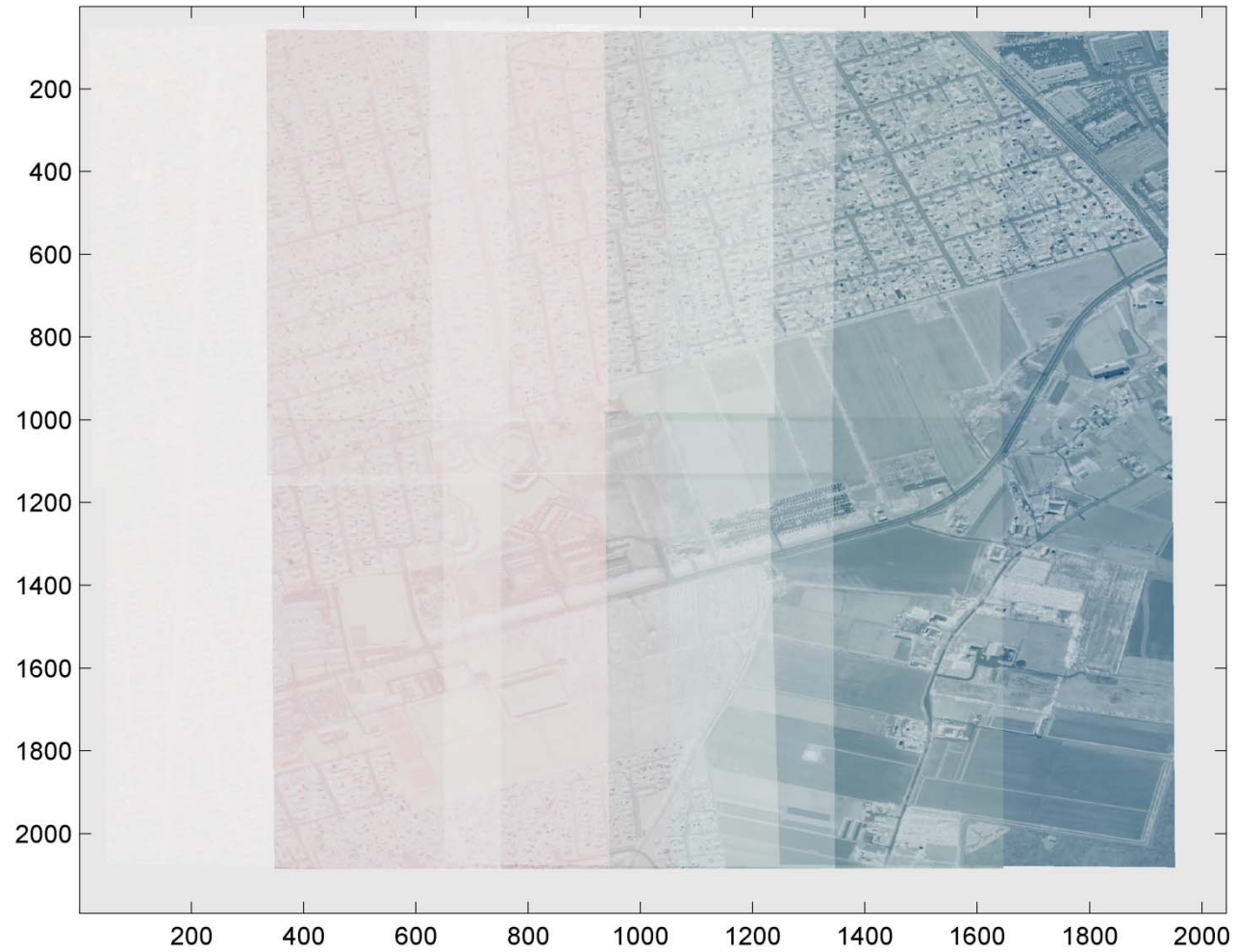


Resultat

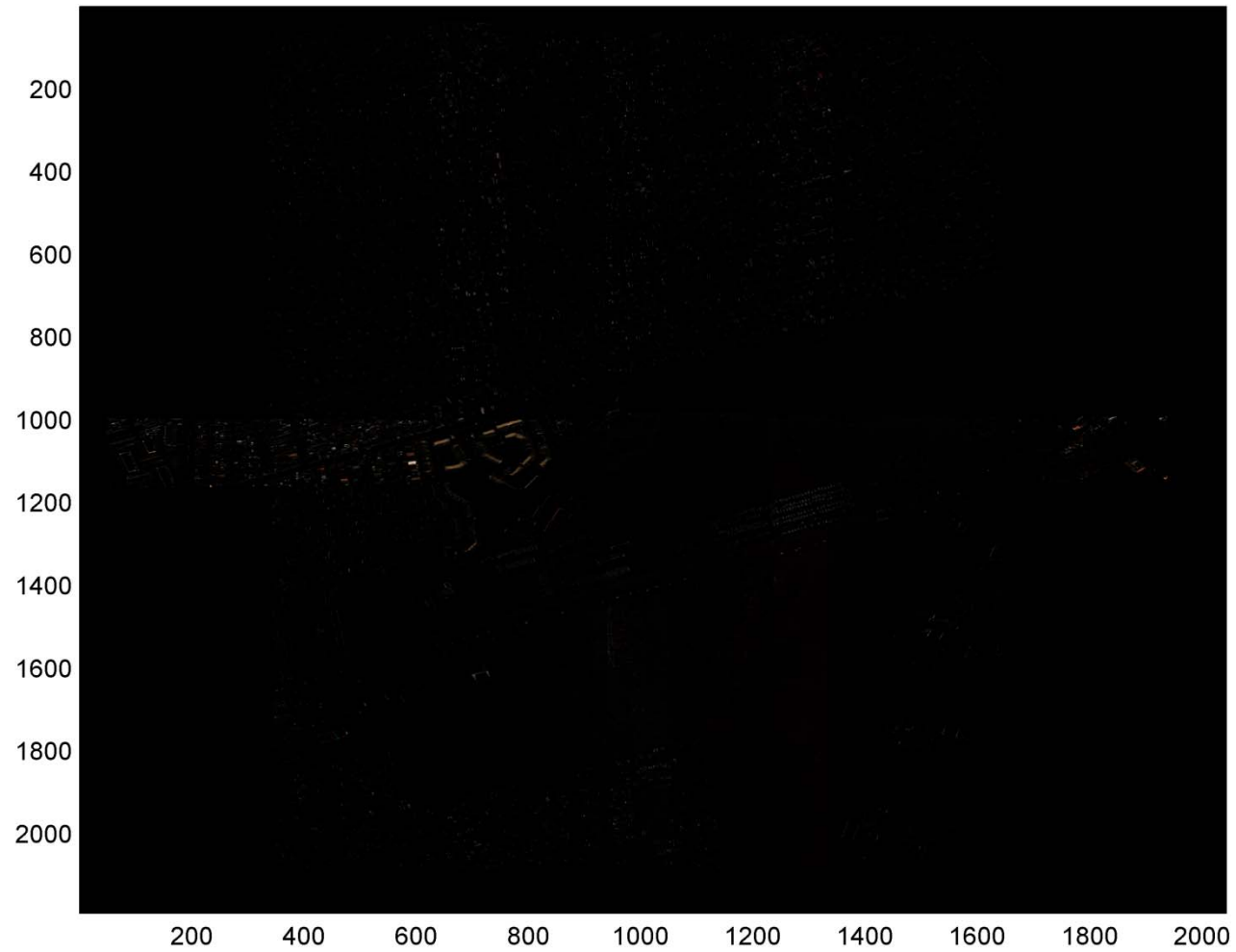
Weighted



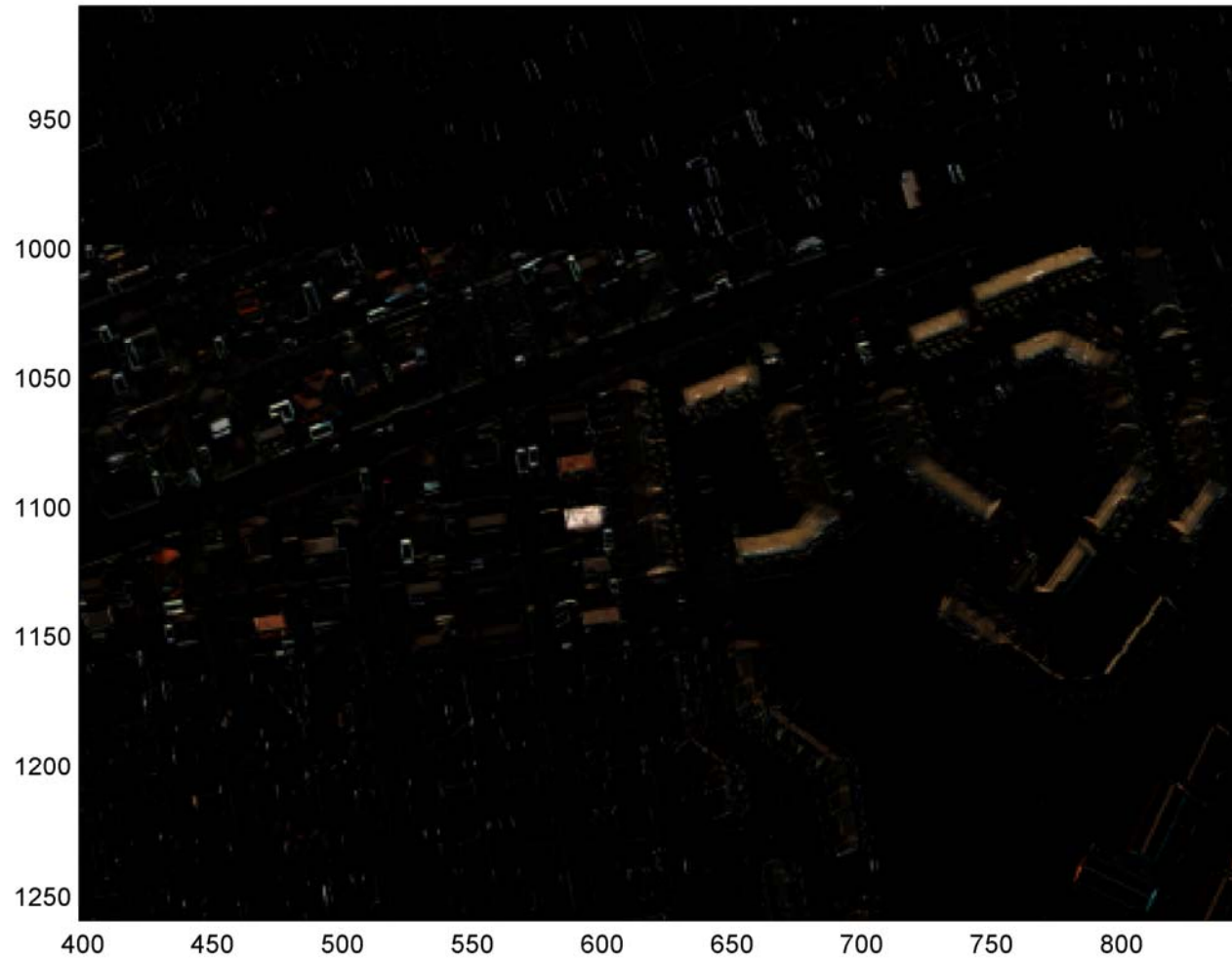
Forskel



Varians



Varians - Zoom



Lighed med stråleudjævning betyder vi også kan indsætte udelige betingelser på farven.

Dette smidiggøre farve diskussionen med kunden.

Kommunal direktørens hus

F.eks.

Weighted



Videre arbejde

- Få flere data
- Seem line detection og udjævning mht., til no change pixels.
- Evt. Andre modeller end den affine.