

### **POVIJEST**

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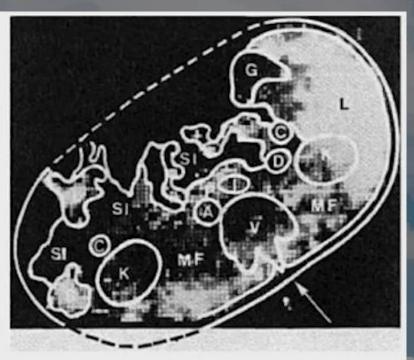
medicinsko oslikavanje dinamičnog srčanog mišića 1970-ih i 80-ih godina

### originalna ideja - smanjenje <mark>šuma u obradi medicinskih</mark> slika



Fig. 1.

Cross-sectional line-scan NMR image through the abdomen at L2-3. Arrow indicates mid-line posterior. Left side lies to the left of the illustration. Bright zones correspond in general to high mobile proton content. See Fig. 2 for labelled details.



F1G. 2.

Labelled image of Fig. 1. A=aorta, C=colon, D=duodenum, G=gall-bladder, I=inferior vena cava, K= kidneys, L=liver, P=pancreas, S=spleen, SI=stomach and intestines, V=vertebra. Abdominal muscles and retroperitoneal fat (MF) are seen adjacent to the vertebra.

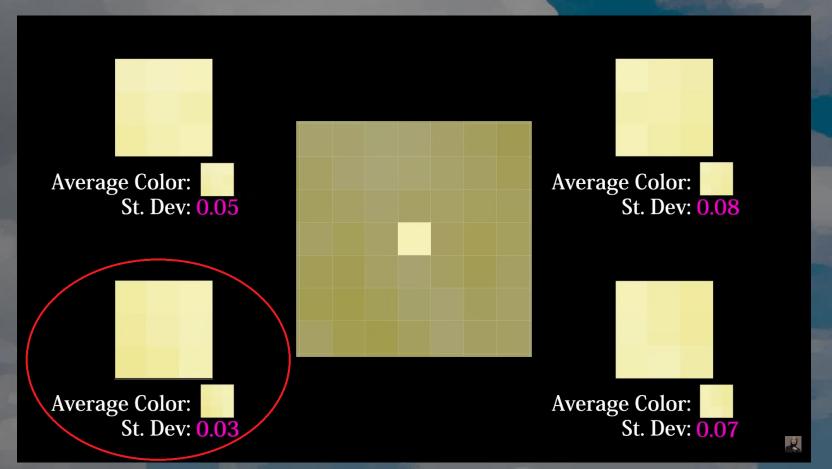


nelinearni filtar

izglađivanje

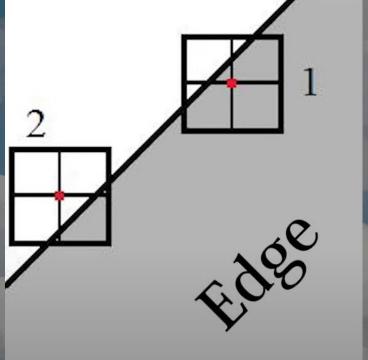
smanjenje šuma

očuvanje rubova



srednja vrijednost podregije s minimalnom varijancom

a	a	a/b	b	b
a	a	a/b	b	b
a/c	a/c	a/b/ c/d	b/d	b/d
С	С	c/d	d	d
С	С	c/d	d	d



#### običan Kuwahra filter sa ker<mark>nel size 9 na slike sa i bez šuma</mark>





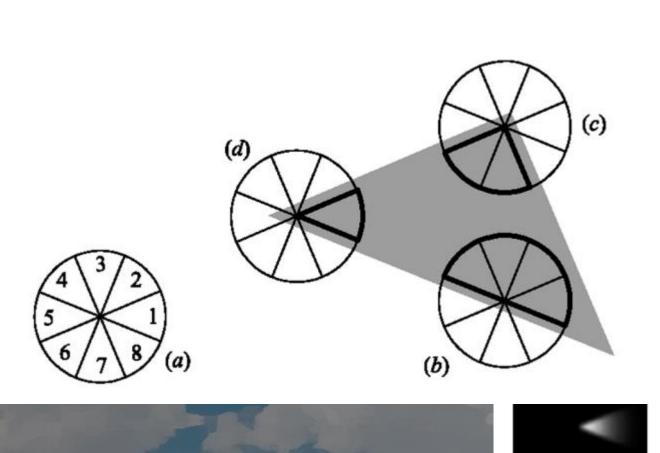
## Generaliziran Kuwahara filter

30 godina kasnije

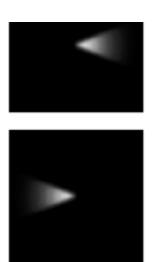
Giuseppe Papari, Nicolai Petkov i Patrizio Campisi

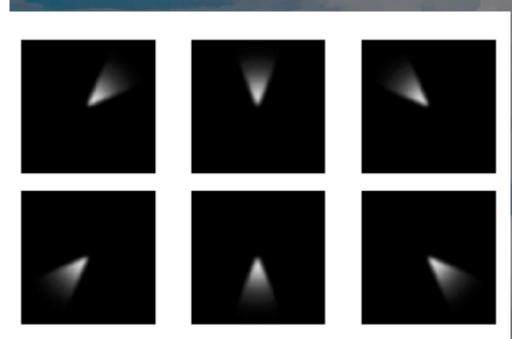
moderniziraju Kuwahara filter

- umanjiti kutijaste artefakte
- rubne linije



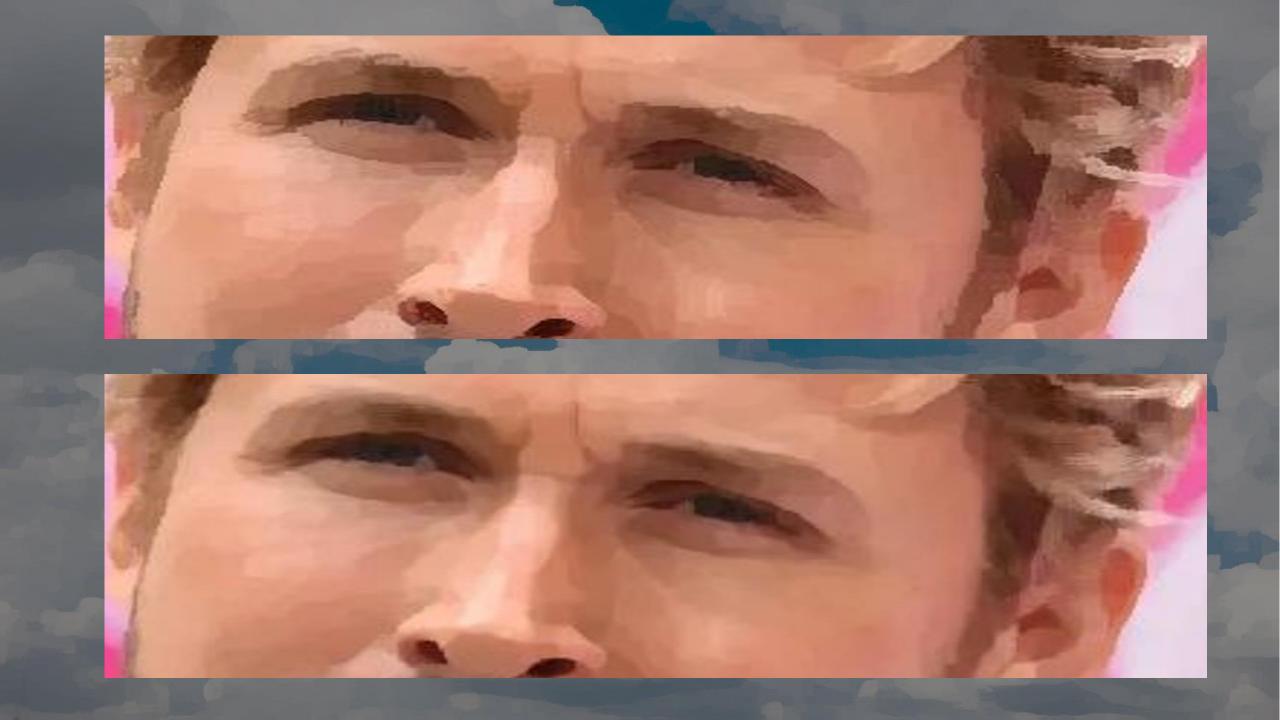
promjena oblika podregija lokalnih prosjek -> Gaussove težinske funkcije





#### običan i generaliziran Kuwahra filter sa kernel size 9



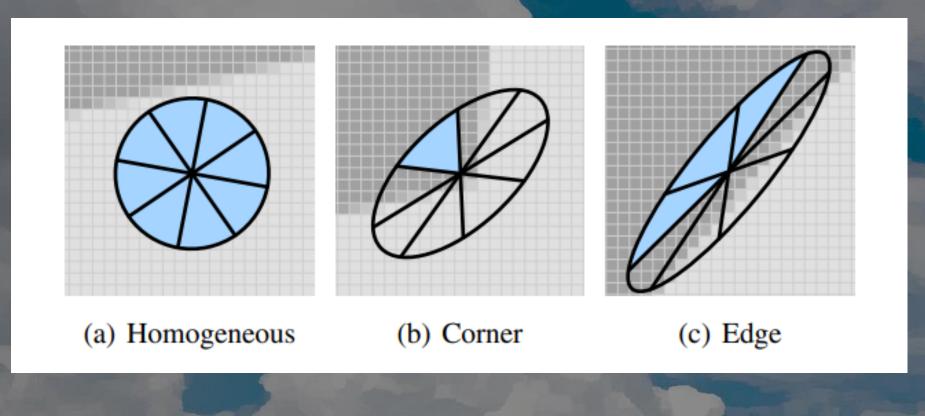


# Anizotropan Kuwahara filter

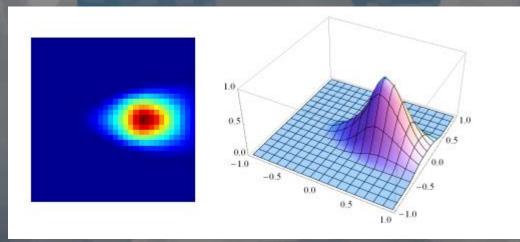
2010. Jan Eric Kyprianidi, Amir Semmo, Henry Kang, Jürgen Döllner

anizotropno - svojstvo obrade slike na način ovisan o smjeru

polinomske funkcije



svojstveni vektori informacije o smjeru slike –
promjena oblika kernela



### Običan, generalizirani i anizotropni Kuwahara filter

