

Concepts of medical image post-processing

WORK & DISCUSSION

RESULTS

Christian Mata

Christian.Mata-Miquel@u-bourgogne.fr

To discuss and work: RESULTS

2

□ IMAGE: U64

Original image



Blured image (sigma=0)



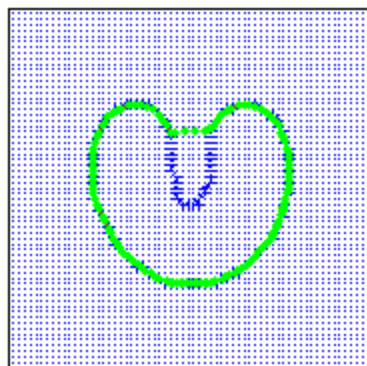
Original image



Blured image (sigma=0)



Standard potencial field



Click on images for magnification

<--Back

Back to the previous menu.

Snake

Run snake iterations.

$[x,y] = \text{snakeinterp}(X_{\text{Snake}}, Y_{\text{Snake}})$

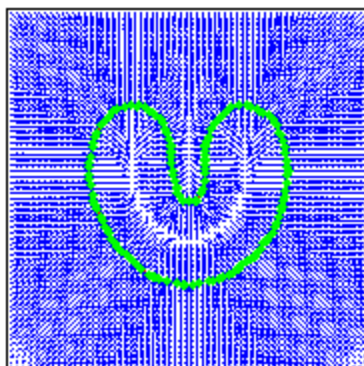
$[x,y] = \text{snakedeform}(x,y, \alpha)$

Alpha

Tension of the snake.

Beta

GVF (mu=0.1 iterations=80)



Click on images for magnification

<--Back

Back to the previous menu.

Snake

Run snake iterations.

$[x,y] = \text{snakeinterp}(X_{\text{Snake}}, Y_{\text{Snake}})$

$[x,y] = \text{snakedeform}(x,y, \alpha)$

Alpha

Tension of the snake.

Beta

<-- Back	Deform
Alpha:	0.5
Beta:	0
Gamma:	1
Kappa:	0.6
Dmin:	0.5
Dmax:	2
Iterat.:	1200
Initial.	Manual
<input type="checkbox"/> Radi...	0.5
<input checked="" type="checkbox"/> Dots	5
Load S.	Save S.

Standard

GVF

Shape Modelling: approaches

3

□ IMAGE: U64

▣ **Standard**

- Doing many iterations is better? → No, It is not a perfect segmentation
- Good initialization
- Modifying Alpha is faster but be careful because should be used just for details

▣ **GVF**

- It is good for “Segment hole, corners...”
- Less iterations VS Standard

▣ **Conclusion**

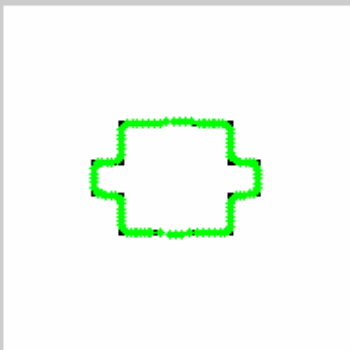
- GVF is better than standard in this case
- It is the “TRUE” example to use GVF

To discuss and work: RESULTS

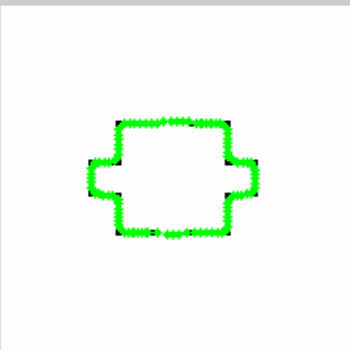
4

□ IMAGE: Room

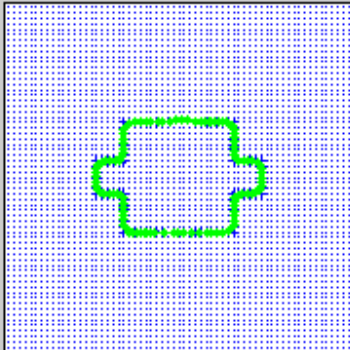
Original image



Blured image (sigma=0)

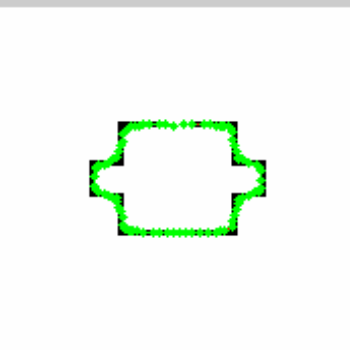


Standard potential field

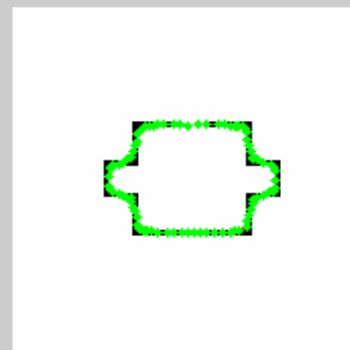


Click on images for magnification.
<-- Back
Back to the previous menu.
Snake
Run snake iterations.
`[x,y] = snakeinterp(XSnake,YSnake)`
`[x,y] = snakedeform(x,y,alpha,beta,`
Alpha
Tension of the snake.
Beta

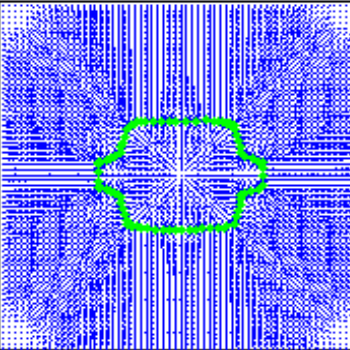
Original image



Blured image (sigma=0)



GVF (mu=0.1 iterations=80)



Click on images for magnification.
<-- Back
Back to the previous menu.
Snake
Run snake iterations.
`[x,y] = snakeinterp(XSnake,YSnake)`
`[x,y] = snakedeform(x,y,alpha,beta,`
Alpha
Tension of the snake.
Beta

<-- Back **Deform**

Alpha: 0.2
Beta: 0
Gamma: 1
Kappa: 0.6
Dmin: 0.5
Dmax: 2
Iterat.: 20

Initial. **Manual**

☐ Radius: 0.5
☒ Dots 5

Load S. **Save S.**

Standard

GVF

Shape Modelling: approaches

5

□ IMAGE: Room

▣ **Standard**

- Good segmentation for a one object!!
- Doing many iterations is better? → > 400 iterations is obtained the same result
- Good initialization? The result is quite similar

▣ **GVF**

- The same than the standard deviation.
- The forces are pushing for the corners!

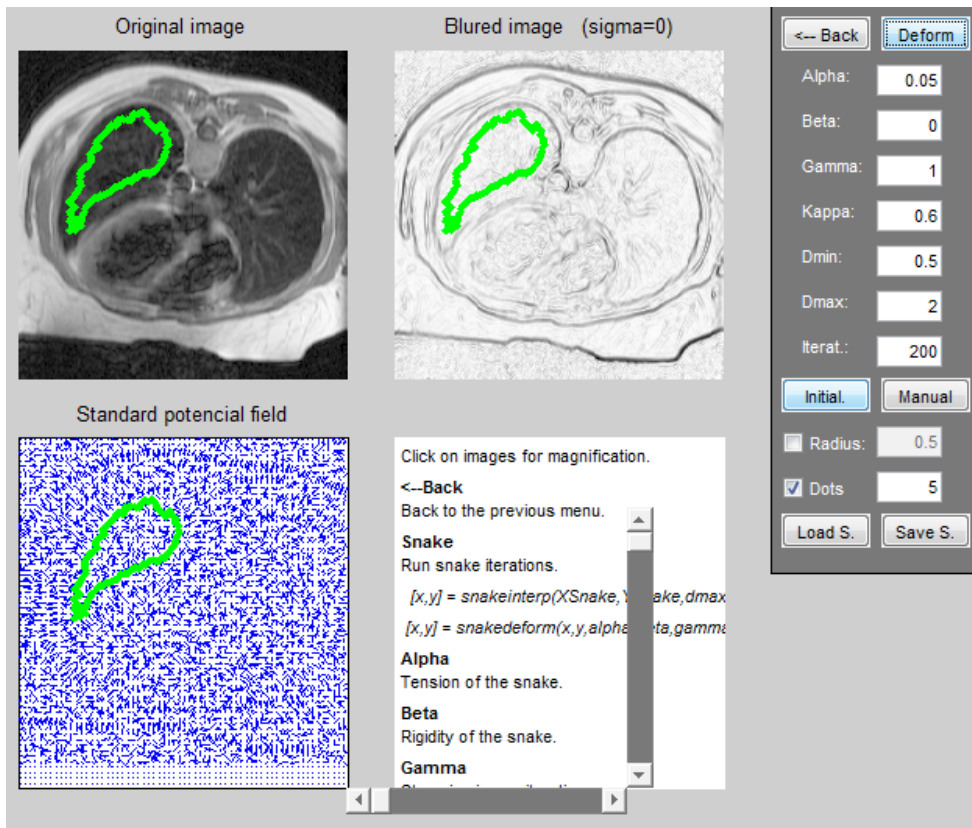
▣ **Conclusion**

- Standard and GVF are the same in this case just for one object.
- Shows that the Snake algorithm has imperfections.

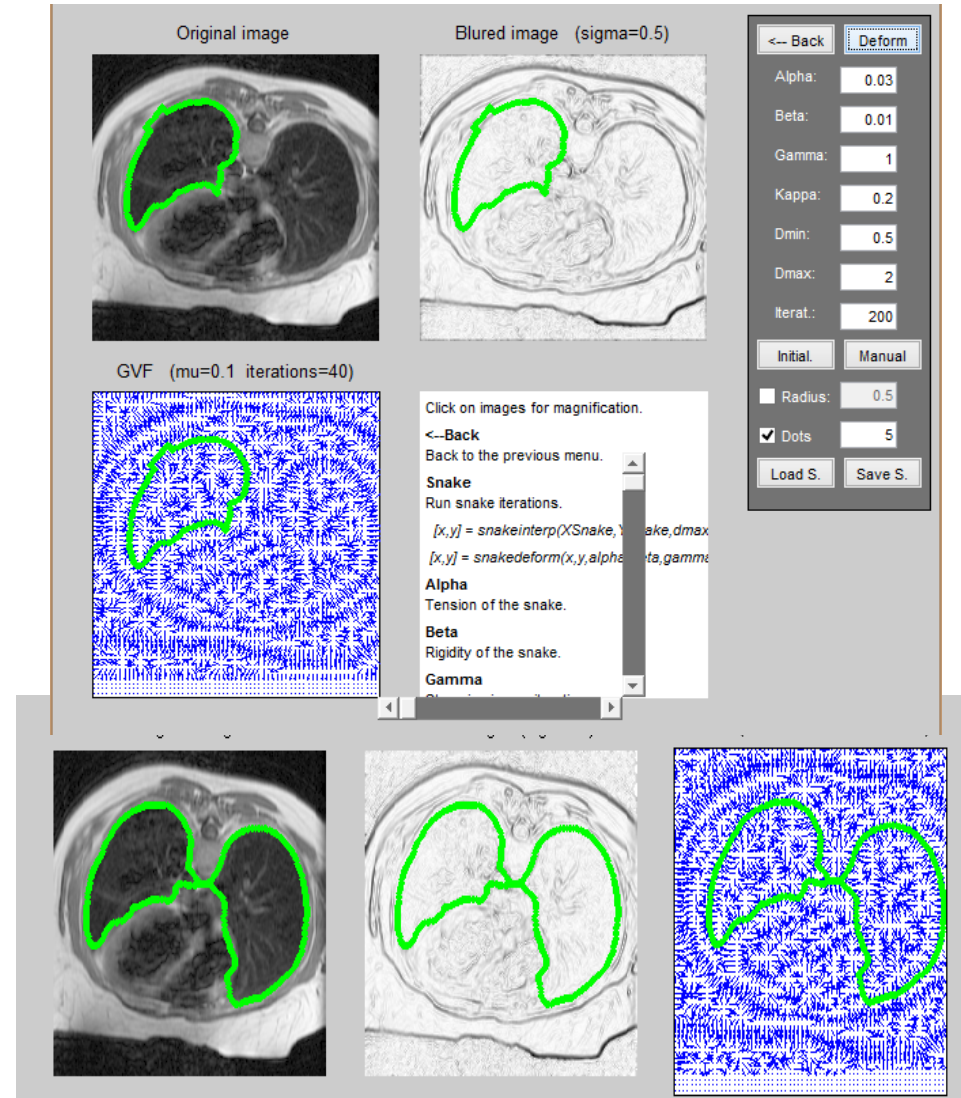
To discuss and work: RESULTS

6

□ IMAGE: Chest



Standard



GVF

Shape Modelling: approaches

7

□ IMAGE: Chest

▣ Standard

- Automatic trace is not good, why? → Many regions and the algorithm cannot detect.
- Manual trace? → Can detect areas but is not also good.
- Forces cannot visualize all the regions and it is a big problem...

▣ GVF

- Using a manual trace can obtain better results in GVF.
- Forces can detect the regions compared with standard.

▣ Conclusion

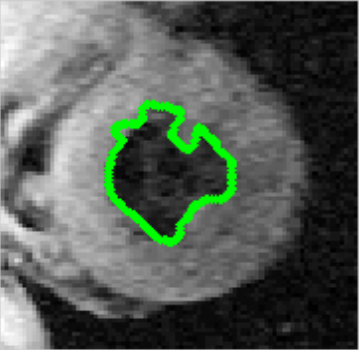
- GVF is good when an image contains many regions and using a manual initialization.

To discuss and work: RESULTS

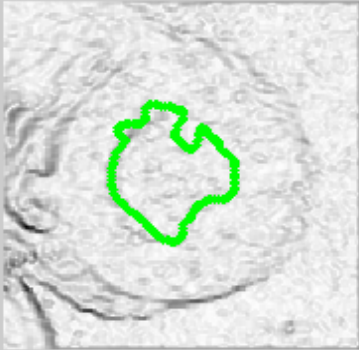
8

□ IMAGE: Heart


Original image



Blured image (sigma=0.5)



Standard potential field



Click on images for magnification.

<--Back
Back to the previous menu.

Snake
Run snake iterations.

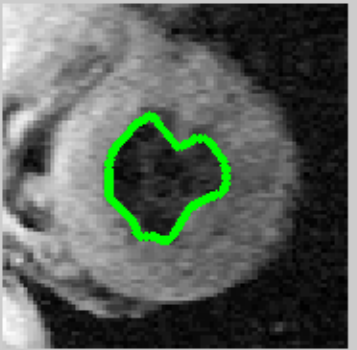
```
[x,y] = snakeinterp(XSnake,YSnake)
```

```
[x,y] = snakedeform(x,y,alpha,beta,
```

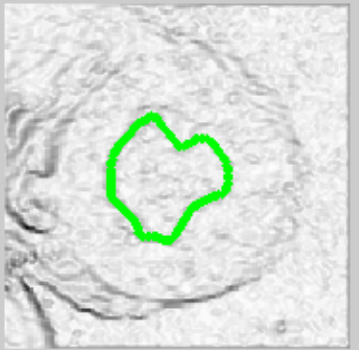
Alpha
Tension of the snake.

Beta

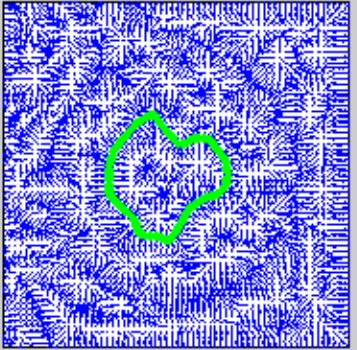
Original image



Blured image (sigma=0.5)



GVF (mu=0.1 iterations=80)



Click on images for magnification.

<--Back
Back to the previous menu.

Snake
Run snake iterations.

```
[x,y] = snakeinterp(XSnake,YSnake)
```

```
[x,y] = snakedeform(x,y,alpha,beta,
```

Alpha
Tension of the snake.

Beta

<-- Back **Deform**

Alpha:

Beta:

Gamma:

Kappa:

Dmin:

Dmax:

Iterat.:

Initial. **Manual**

☐ Radius:

☒ Dots

Load S. **Save S.**

Standard

GVF

Shape Modelling: approaches

9

□ IMAGE: Heart

▣ **Standard**

- Doing a lot of iterations the result is not improved.
- Forces cannot detect the middle part.
- The segmentation is not perfect, not bad

▣ **GVF**

- It is obtained a better results using GVF.
- Forces can detect the main regions.

▣ **Conclusion**

- The manual initialization is important.
- GVF better than standard.