Hi all -- especially non-parametric blob-detection afficianados --

I am looking for help with:
* What are a few good references?
* Putting the ones I know a little about into context!

I began to look for references about several very different approaches I recalled from past workshops.

1/ Clem Karl et al. 2003 from the Multscale workshop (see www.ics.uci.edu/~dvd/MultScaleConf/agenda.html): used a simple Bayesian-ish "Shape" prior requiring a smooth boundary for tomgraphic reconstruction ---- i.e. tracking 3D blobs in space and time with just a few sensors. In his example, the sensors moved a lot (and the blobs evolved somewhat). In Alex's example, the sun moves (and the blobs evolve a lot).

I also recall Becca W. having some cogent comments on the realm of aplicability of Clem Karl's method.

The references I could find on Clem Karls website that looked related included:

Y. Shi and W. C. Karl, ``Tomographic Reconstruction of Dynamic Objects,'' in Computational Imaging, C. A. Bouman and R. L.Stevenson editors, Proc. SPIE, Vol. 5016, SPIE, Santa Clara, CA,January 20-24, 2003.

Y. Shi and W. Karl, ``Object-based Dynamic Tomography,'' invited lecture at the 2003 IEEE AP-S International Symposium and USNC/CNC/URSI National Radio Science Meeting, Columbus, Ohio, June22-27, 2003

A. Litvin and W. C. Karl, ``Shape distributions as priors for image segmentation,'' in Computational Imaging, C. A. Boumanand R. L. Stevenson editors, Proc. SPIE, Vol. 5016, SPIE, SantaClara, CA, January 20-24, 2004.

and:

Y. Shi and W. C. Karl, ``Differentiable Minimin Shape Distance for Maintaining Topology in Curve Evolution,'' SIAM Conference on ImagingScience, 2004.

Also, I see he is doing the "Level Set" method Becca suggested!

But I don't see any handy *.pdf files to look at.

Anyone have reccomendations, and/or access to on-line versions of these? OR comments on their relevance to our problems?

2/ From the Solar Division meeting of the American Astronomical Society, in June 16-20, 2003, Laurel, MD. Valentina V. Zharkova seemed to have rigorously tested a variety of interesting methods (for high resolution optical). She ended up using simpler methods, e.g. "region growing", as I recall.

I see some abstracts of hers about results from the Solar features

catalog (a European Grid of Solar Observations initiative for which she used these methods), but only a litle on methods, like pdf files from:
http://www.cyber.brad.ac.uk/egso/publications/publication.html

How do her methods compare in usefulness, robustness, ability to estimate errors, etc? Anyone have any idea?

3/ Last but not least: What about Hyunsook Lee's "Convex Hull Peeling" technique? (See www.stat.psu.edu/~hlee/PRESENTATION/SAMSI06.pdf) Can it help me define bounadries of shapes, e.g. in (x,y,prob-density) space for my non-parametric "blobs"? It seems to me to be vaguley related to Clem Karl's Shape/Boundary priors, in assuming smoothness and connectivity. It also sounds vaguely like the inverse of Valentina Zharkova's "region growing" methods. True? OR is CHP just not useful in this context?

Anyone have any opinions or reccomendations among all of these?
And/Or how they compare and contrast with muitiscale (i.e. wavelet-like) sorts of feature detection methods?
Not to mention, our ever-aveorite Bayes Blocks?

Also, When and where might "Level Sets" be useful (or not useful)?
(See astrostatistics.psu.edu/samsi06/tutorials/willett_madness.pdf)
Can we get uncertainties out of them? How do they compare with above methods?

With thanks!!
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