

Want to learn Thin Plate Spline

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Dear all:

I used a "smoothing thin plate spline(tps)" for image registration,

and it usually helps to yield good results. But I am not clear about how on earth the close-form solution is obtained from minimizing its bending energy $E(f)$, which is:

$$E(f) = \sum |y - f(x)|^2 + \lambda \int (f_{xx}^2 + f_{xy}^2 + f_{yy}^2) dx dy$$

And if I add additional items to $E(f)$, how can I calculate f again? I am also not wondering if there is any guide/principle for deciding the coefficient λ , except for trying by experiments.

Many paper refer to Wahba's book: *Spline Models for Observational Data* 1990. But it is difficult for me to get one. Can anyone point out another comprehensive reference? A tutorial is most preferred.

Thanks a lot!
Jeff

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