

A NURBS-BASED GRADIENT METHOD FOR SPARSE ANGLE TOMOGRAPHY

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ABSTRACT

In sparse angle tomography one attempts to reconstruct an image from highly undersampled Radon data. The resulting severely ill-posed problem becomes more stable, if the solution is known to be piecewise constant. This has been used in Mumford-Shah-type regularization methods [2, 3], for example, but recently also in [1] where the interfaces in the image are parametrized by NURBS (Non-Uniform Rational B-splines). The latter approach even yields reconstructions in vector-graphics format, but the dependence of the image on the design parameters of the interface curves is non-linear and not differentiable.

In this talk we will see that Radon data, however, remain differentiable almost everywhere and then use gradient-type methods to find NURBS design parameters for the interface curves from sparse angle tomographic data.

REFERENCES

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- [3] M. Storath, A. Weinmann, J. Friel and M. Unser. A splitting approach to Potts regularization of inverse imaging problems. *arXiv:1405.5850v1*, 2014.