

Vector-Valued Image Regularization with PDEs

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Outline

1. Context
2. Image Restoration
3. Image Inpainting
4. Text Removal
5. Image Magnification
6. Flow Visualization

Context

- Techniques for vector-valued image regularization, based on variational methods and PDEs.
- Oriented Laplacian using divergence expressions
- Formulating the divergence form – spectral components
- Building the tensor field!

Image Restoration



Original Image



10% Noise; Zoomed



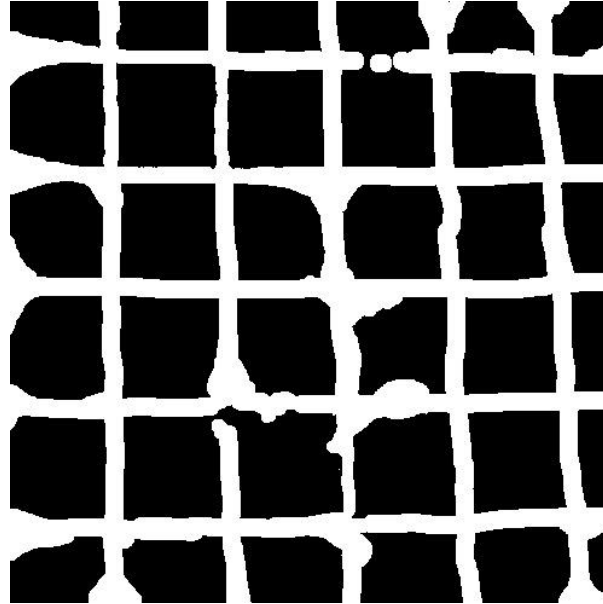
After Regularization (1 iteration)

Image Inpainting



Original Image

+



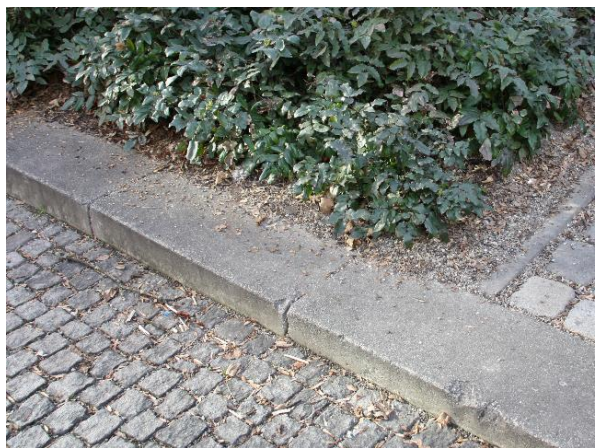
Mask



After Inpainting
(50 Iterations, ~15 minutes)



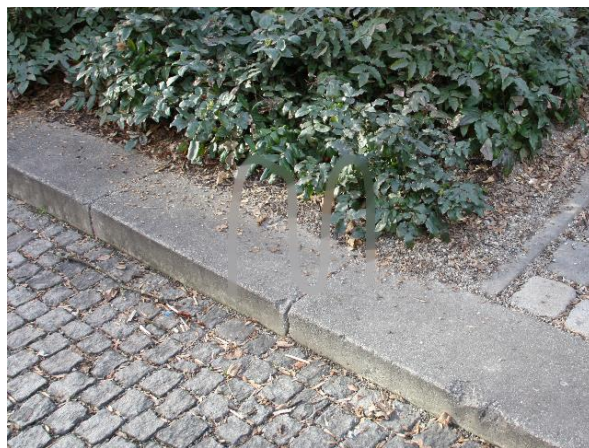
Our Implementation [Tschumperle 2005]



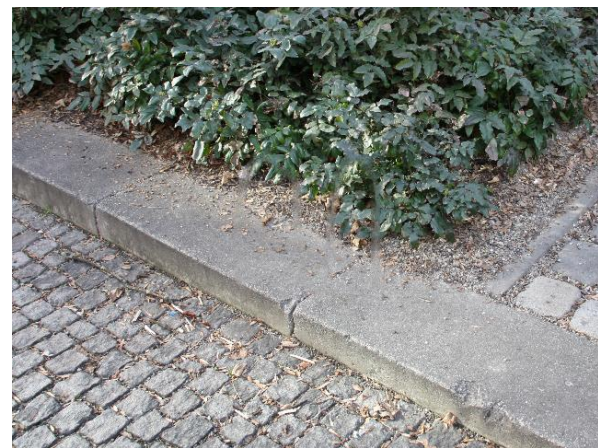
[Bugeau 2010]



[Herling 2012]



[TV 2012]



[Xu 2010]



Our Implementation [Tschumperle 2005]



[Bugeau 2010]



[Herling 2012]



[TV 2012]



[Xu 2010]

Text Removal



Original Image (With Text)



After Text Removal (30 Iterations)

Image Magnification

Bilinear Interpolation



PDE Regularization

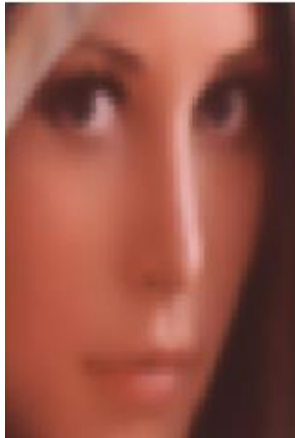


Image Magnification

Bilinear Interpolation



Chota Bheem



PDE Regularization



Bheem

Thank You!