

# Project Details

Pixel Pros

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## 1 Group Members

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## 2 Selected Paper

[Vector-Valued Image Regularization with PDEs: A Common Framework for Different Applications](#)

## 3 Datasets

Verifying on images in the paper and more images with the problems mentioned in experiments

## 4 Analysis and Experiments :

- Analyzing Functional minimization , Divergence expressions, oriented laplacians ,relating them to one another and understanding the geometric significance .
- After coming to a unified expression , modifying it further to a new vector-valued regularization PDE that follows desired local geometric properties
- Numerical implementation of the PDE so far without the need for calculating second derivatives by translating them to gaussian kernels and convolving our image with it .
- Experimenting these kernels to solve real life problems like
  - Color Image Restoration of digital photograph with real noise, due to the bad lighting conditions
  - Improvement of Lossy Compressed Images : To remove undesired bloc artefacts created due to lossy compression algorithms (especially JPEG)
  - Color Image inpainting of images covered with unwanted texts in a structure preserving way
  - Color Image Magnification by linear interpolation of a small image, and applying our PDE and retrieving nonlinear magnified images without jagging or bloc effects

## 5 Verification

Utilizing inbuilt functions in OpenCV to test our results