

# Prokudin-Gorskii Collection

HW1 | Computer Vision

Submitted By:

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GitHub Repository:

<https://github.com/hj2713/CV2/tree/main/HW1>



# Technical Implementation

## Algorithm Pipeline:

1. Load & Preprocess: Images are loaded (checking for 16-bit) and normalized.
2. Channel Splitting: The vertical glass-plate image is split into equal thirds (B, G, R).
3. Feature Extraction: Sobel edges are computed for each channel. This makes the alignment robust to brightness differences between channels.
4. Pyramid Alignment: A 5-level image pyramid is used. Alignment starts at the coarsest level (smallest image) to find approximate offsets, then refines them at each higher resolution.
5. Reconstruction: The Red and Green channels are shifted using the calculated (x, y) offsets to align with the Blue channel.
6. Post-Processing: Borders are auto-cropped (10%) to remove artifacts, and contrast is stretched for better visibility.

# Results Gallery (1)



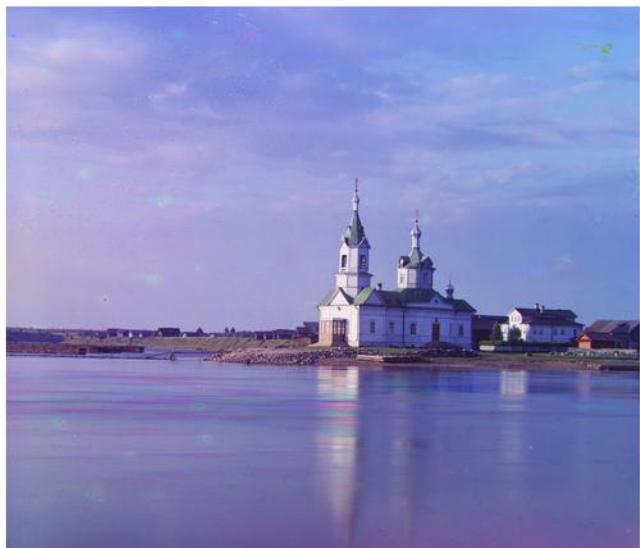
cathedral.jpg  
G: (5, 2), R: (12, 3)



monastery.jpg  
G: (-3, 2), R: (3, 2)



tobolsk.jpg  
G: (3, 3), R: (6, 3)



Church  
G: (25, 4), R: (58, -4)

## Results Gallery (2)



Emir  
G: (49, 24), R: (107, 40)



Harvesters  
G: (60, 17), R: (124, 14)

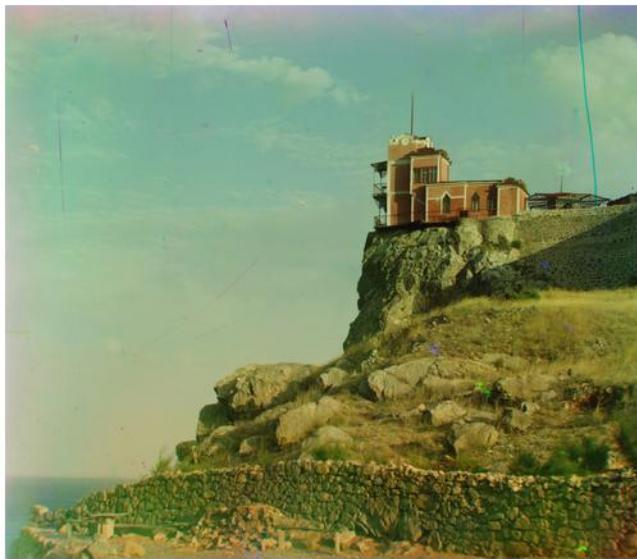


Icon  
G: (42, 17), R: (90, 23)



Italil  
G: (38, 22), R: (77, 36)

## Results Gallery (3)



Lastochikino  
G: (-3, -2), R: (76, -8)



Lugano  
G: (41, -17), R: (92, -29)



Master-Pnp-Prok-00000-00082A  
G: (32, 4), R: (79, 7)

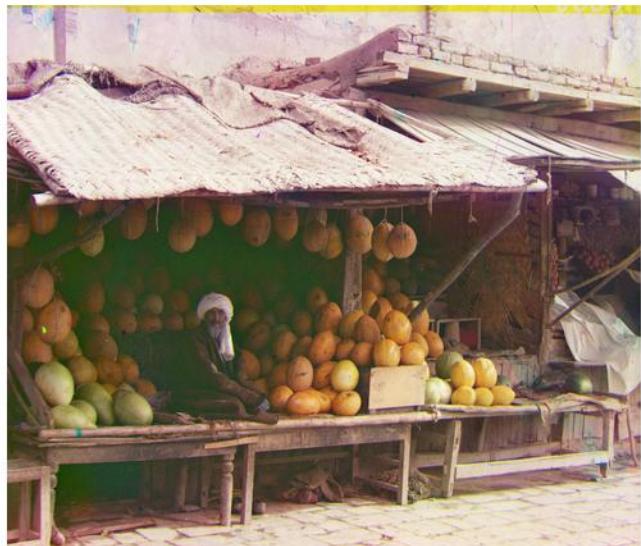


Master-Pnp-Prok-00100-00172A  
G: (39, -1), R: (151, -7)

## Results Gallery (4)



Master-Pnp-Prok-00100-00187A  
G: (33, -11), R: (139, -26)



Melons  
G: (80, 10), R: (177, 13)



Self\_Portrait  
G: (78, 29), R: (176, 37)



Siren  
G: (49, -6), R: (96, -24)

## Results Gallery (5)



Three\_Generations  
G: (54, 12), R: (111, 9)