

Short Report: Ideas to Boost Performance

This report outlines strategies to enhance the keypoint matching solution for satellite images.

1. Use Advanced Detectors

- Replace ORB with SIFT, SURF, or SuperPoint for better robustness and accuracy.

2. Incorporate Deep Learning

- Use models like Siamese Networks or LoFTR for feature matching tailored to satellite imagery.

3. Preprocess Images

- **Contrast Normalization:** Use histogram equalization.
- **Denoising:** Apply filters to reduce noise.

4. Enhance Matching

- Use **Mutual Nearest Neighbors** for high-confidence matches.

5. Optimize Performance

- Leverage **GPU Acceleration** or multi-threading for faster processing.
- Scale down large images to meet GPU memory limits.

6. Augment for Robustness

- Apply **seasonal augmentation** (color, brightness changes) to handle variations.
- Simulate transformations like scaling and rotation during evaluation.

7. Use Geospatial Data

- Utilize geospatial metadata to pre-align images for more efficient matching.
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These enhancements, including seasonal augmentation and image scaling, will improve accuracy, robustness, and processing efficiency for satellite image keypoint matching.