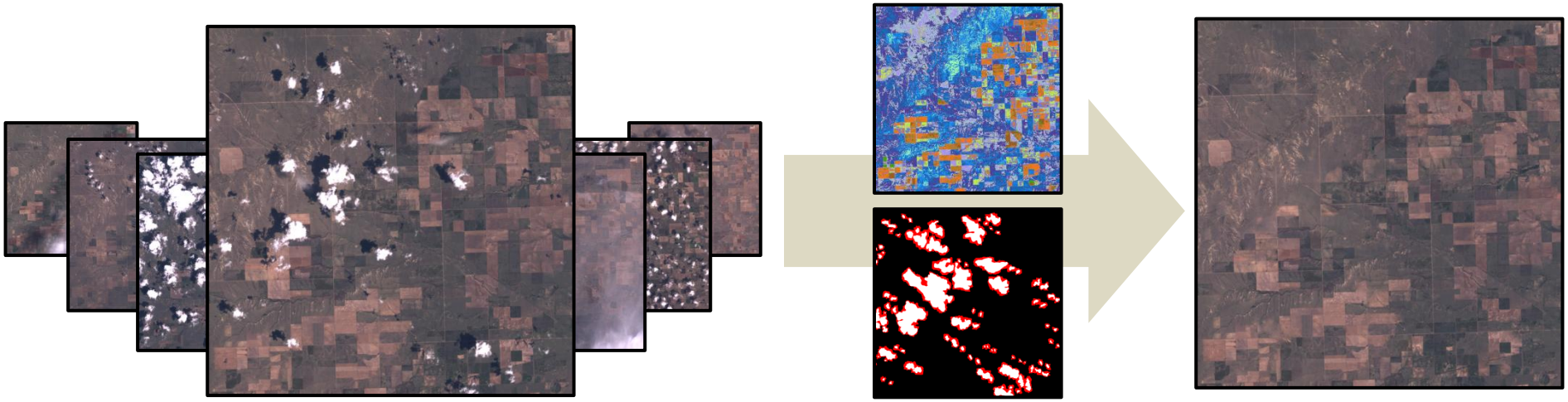
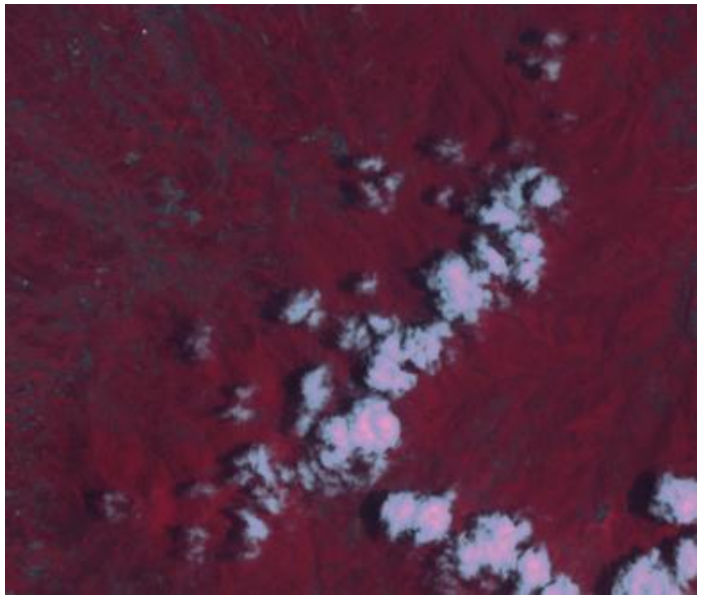
Patch-based Information Reconstruction of Cloud-contaminated Multitemporal Images



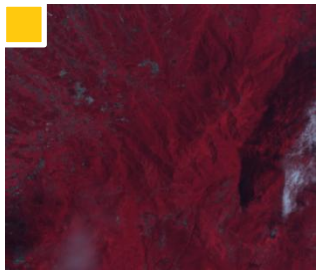
Experiment Results and Analysis

Result of information reconstruction

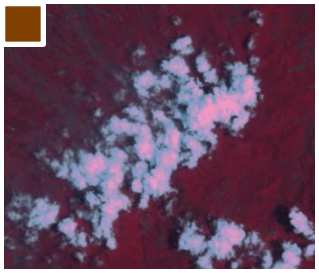
Data I - Mountainous area (Yangmingshan, Taiwan)



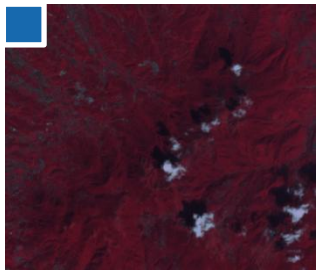
Target image (2002/05/28)



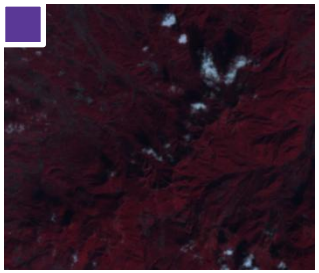
1999/08/08



2001/05/25



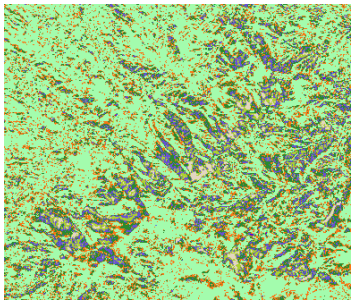
2002/10/03



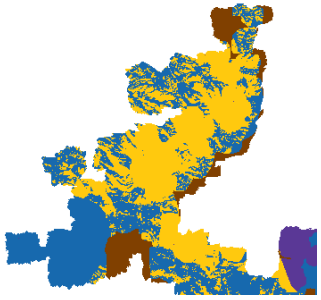
2002/12/06

Reference images

Detected cloud



Partition result



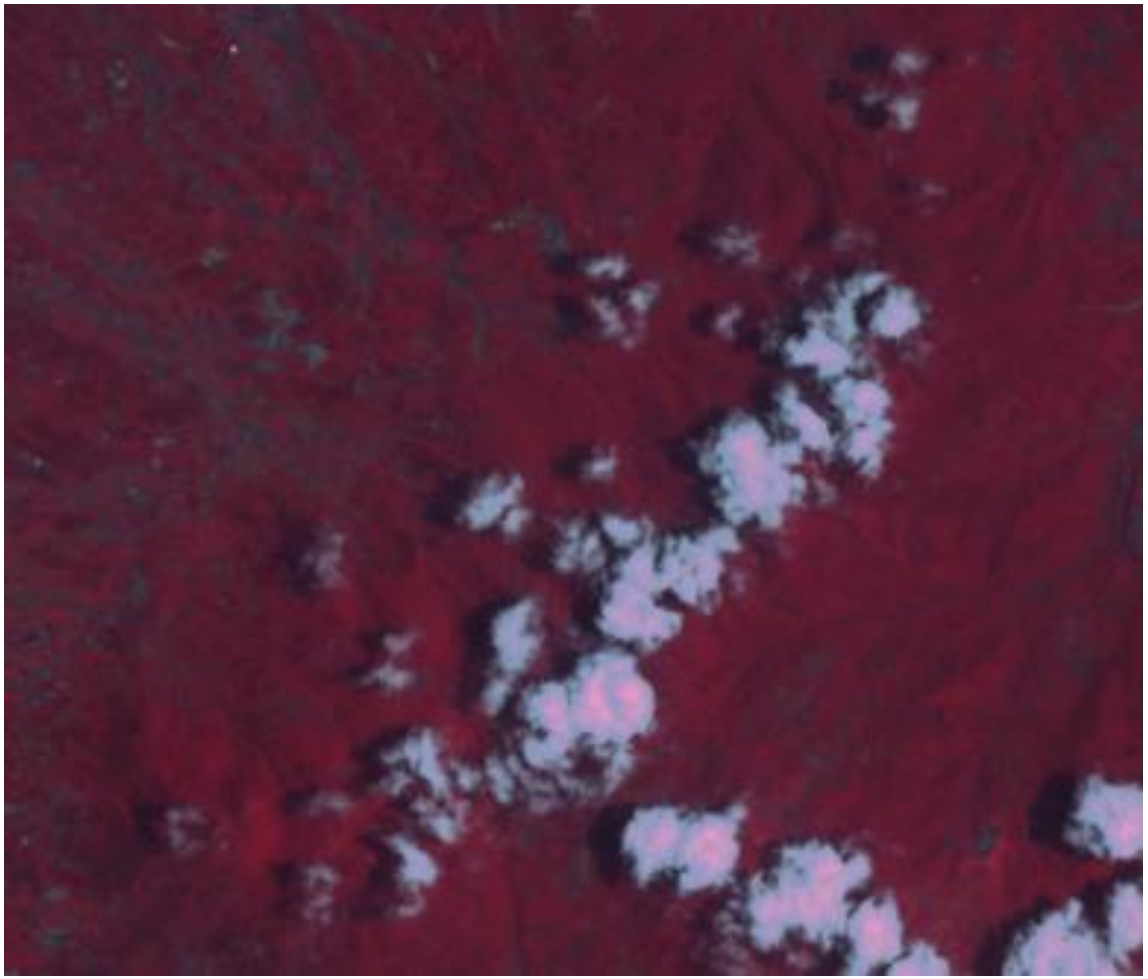
Cloning patches

Optimal Seam

Experiment Results and Analysis

Result of information reconstruction

Data I - Mountainous area (Yangmingshan, Taiwan)

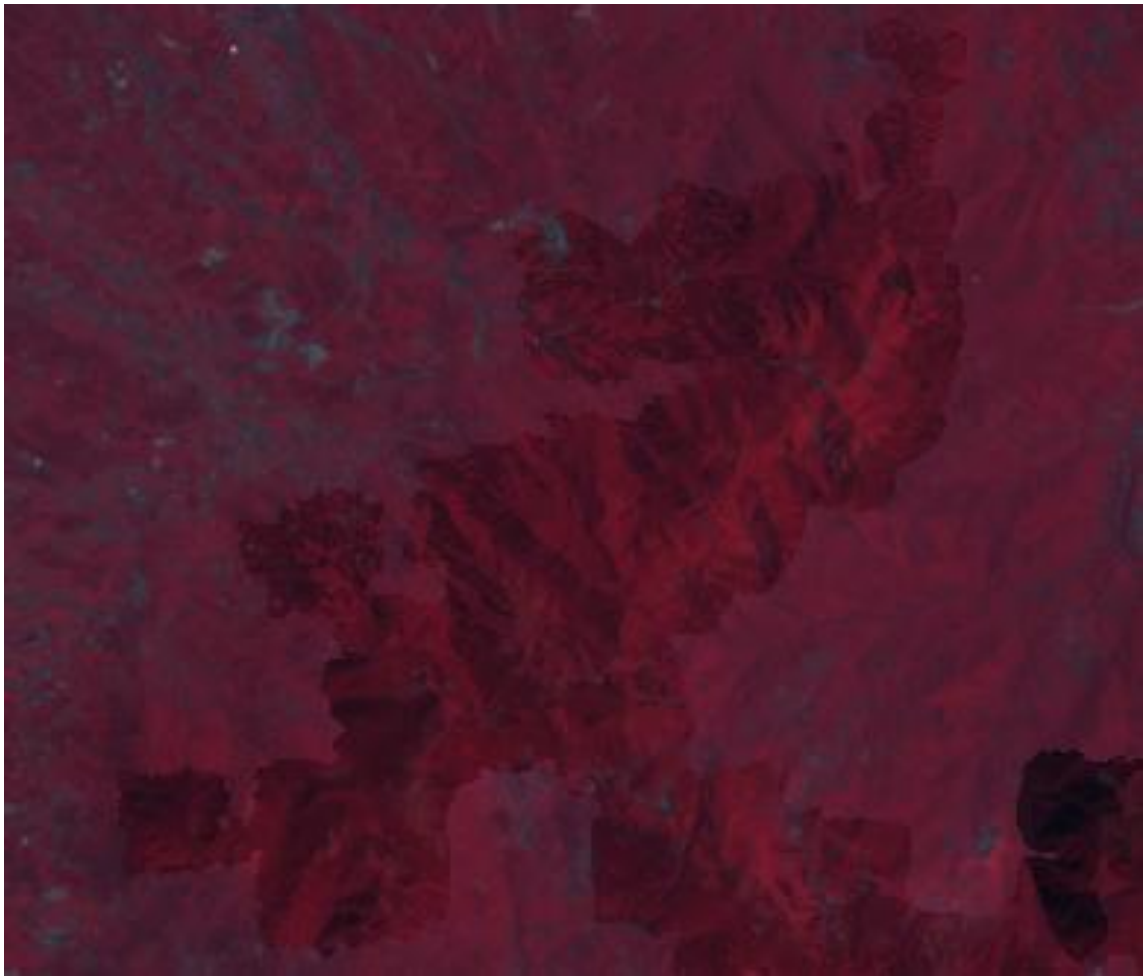


Original Image

Experiment Results and Analysis

Result of information reconstruction

Data I - Mountainous area (Yangmingshan, Taiwan)

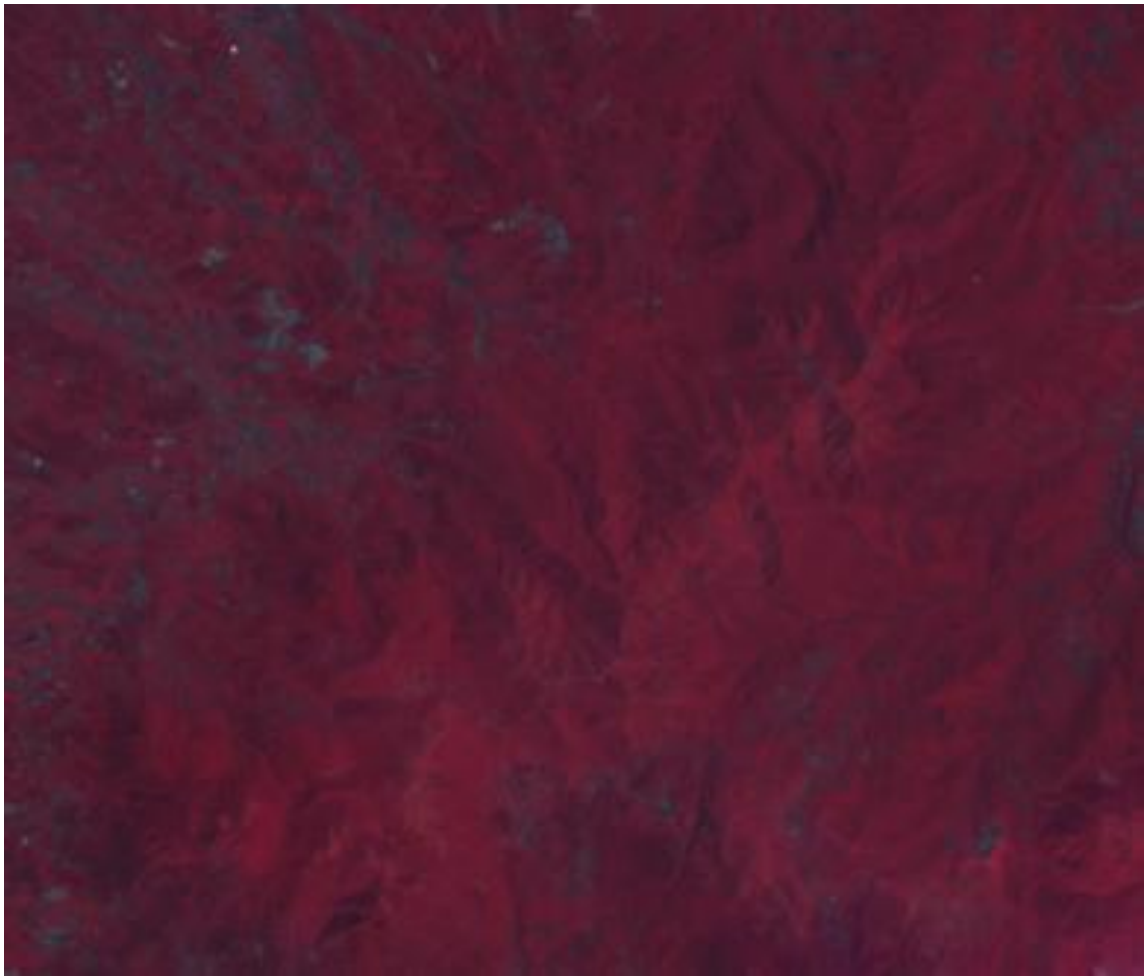


Patch Replacement Result

Experiment Results and Analysis

Result of information reconstruction

Data I - Mountainous area (Yangmingshan, Taiwan)

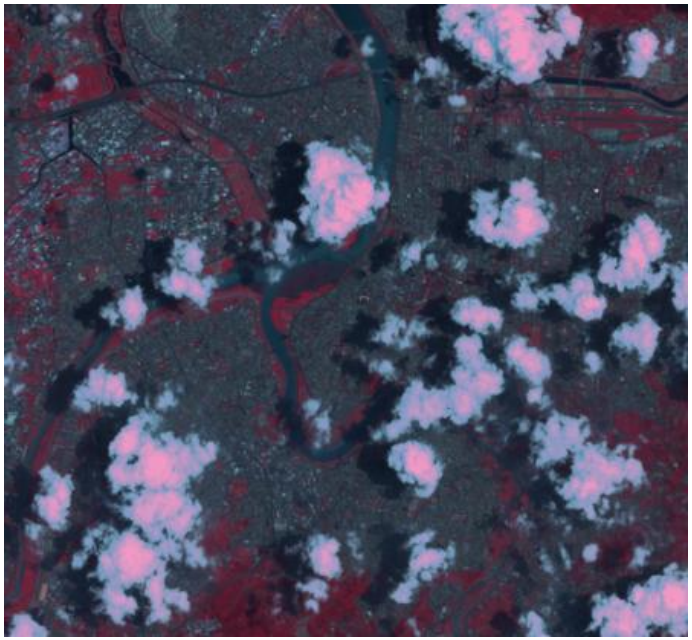


Our Result

Experiment Results and Analysis

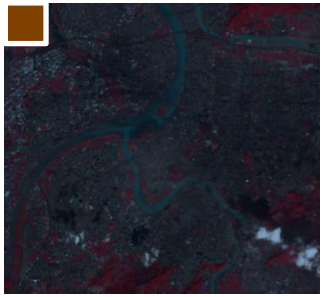
Result of information reconstruction

Data II - Urban area (Taipei, Taiwan)

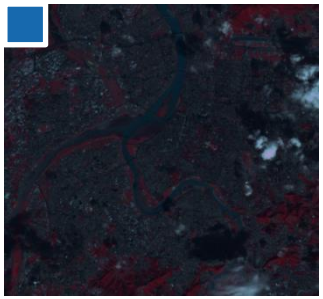


Target image (2001/06/26)

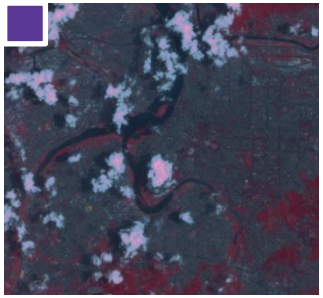
1999/08/08



2000/11/14



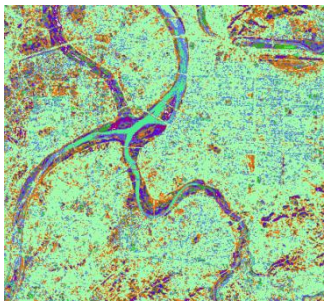
2000/12/16



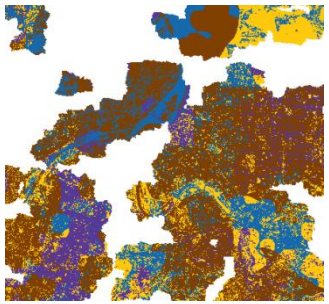
2003/05/31

Reference images

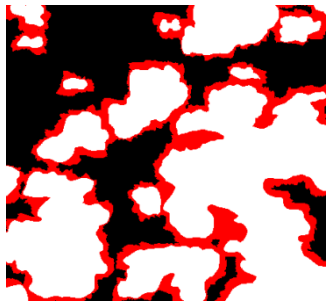
Detected cloud



Partition result



Cloning patches

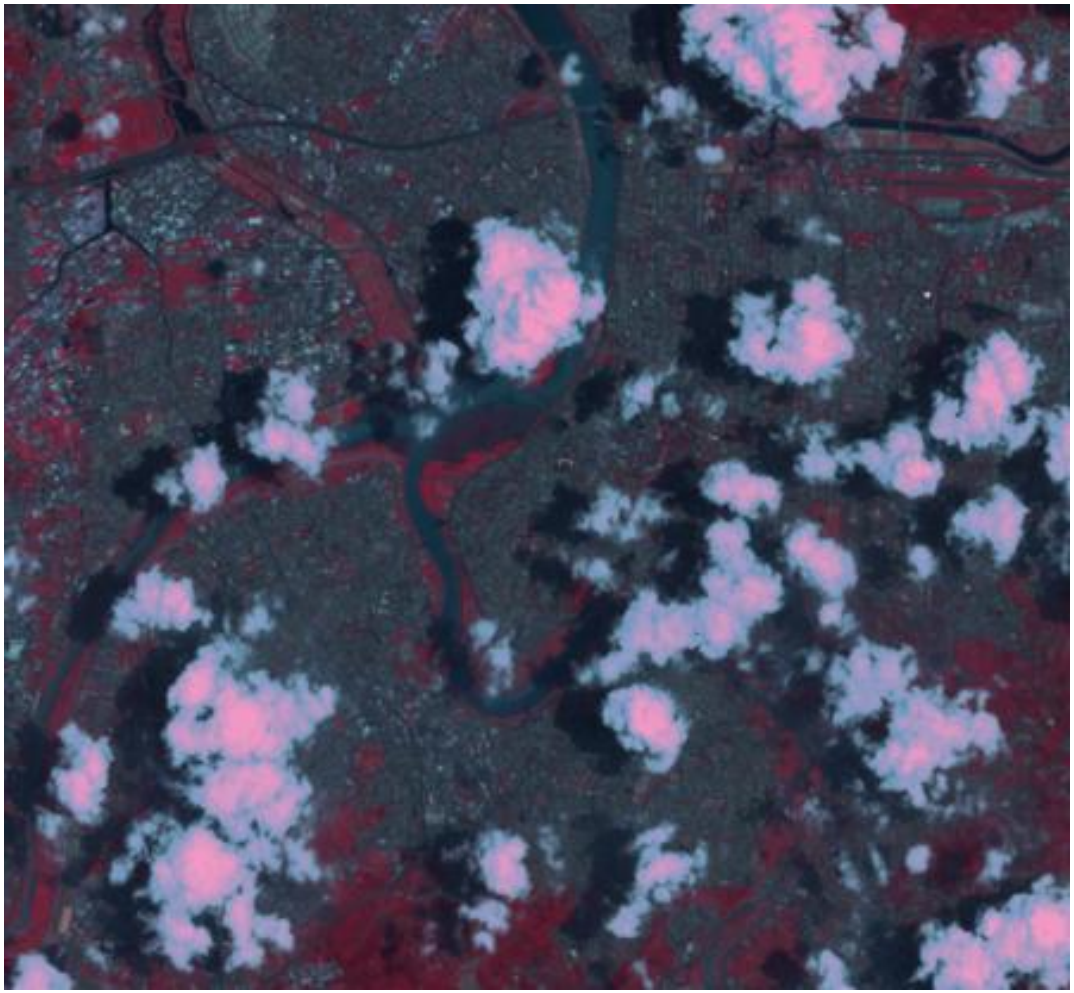


Optimal Seam

Experiment Results and Analysis

Result of information reconstruction

Data II - Urban area (Taipei, Taiwan)

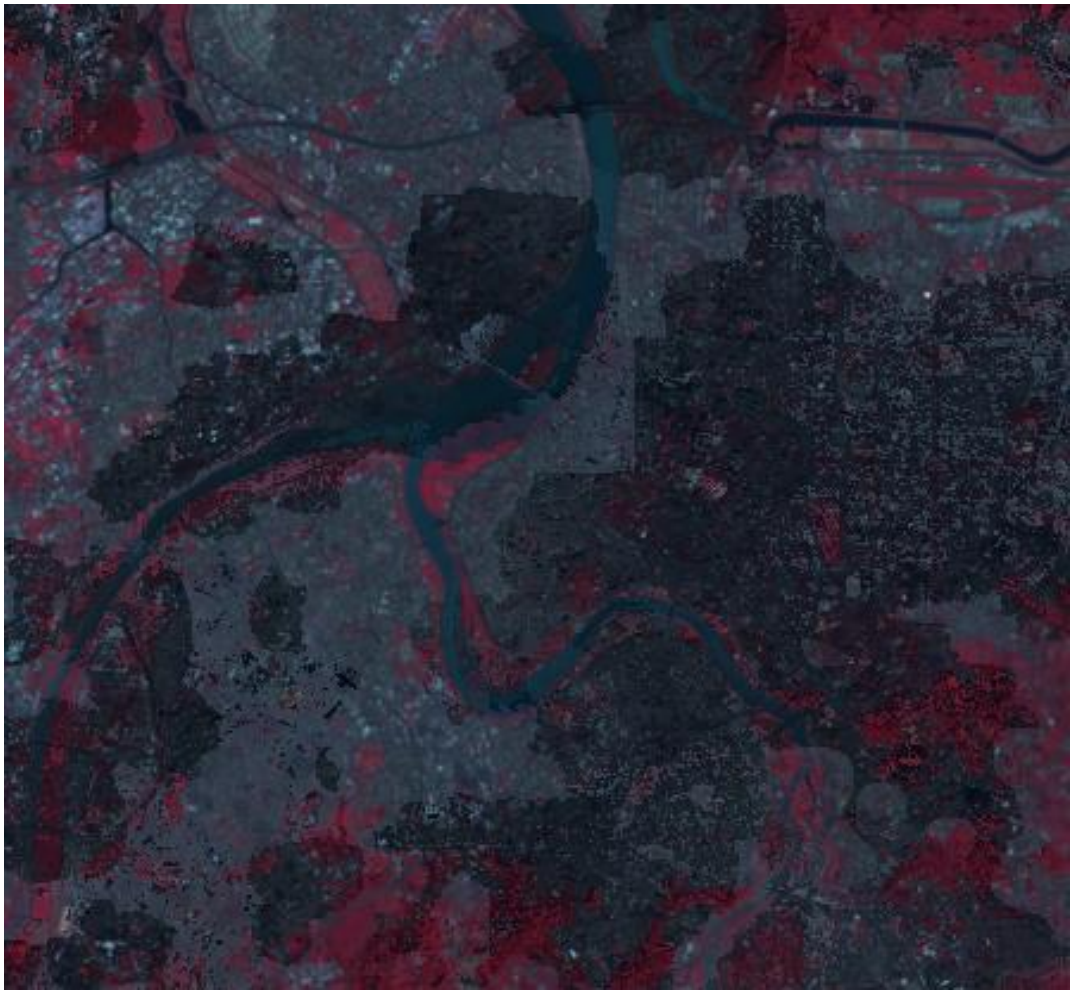


Original Image

Experiment Results and Analysis

Result of information reconstruction

Data II - Urban area (Taipei, Taiwan)

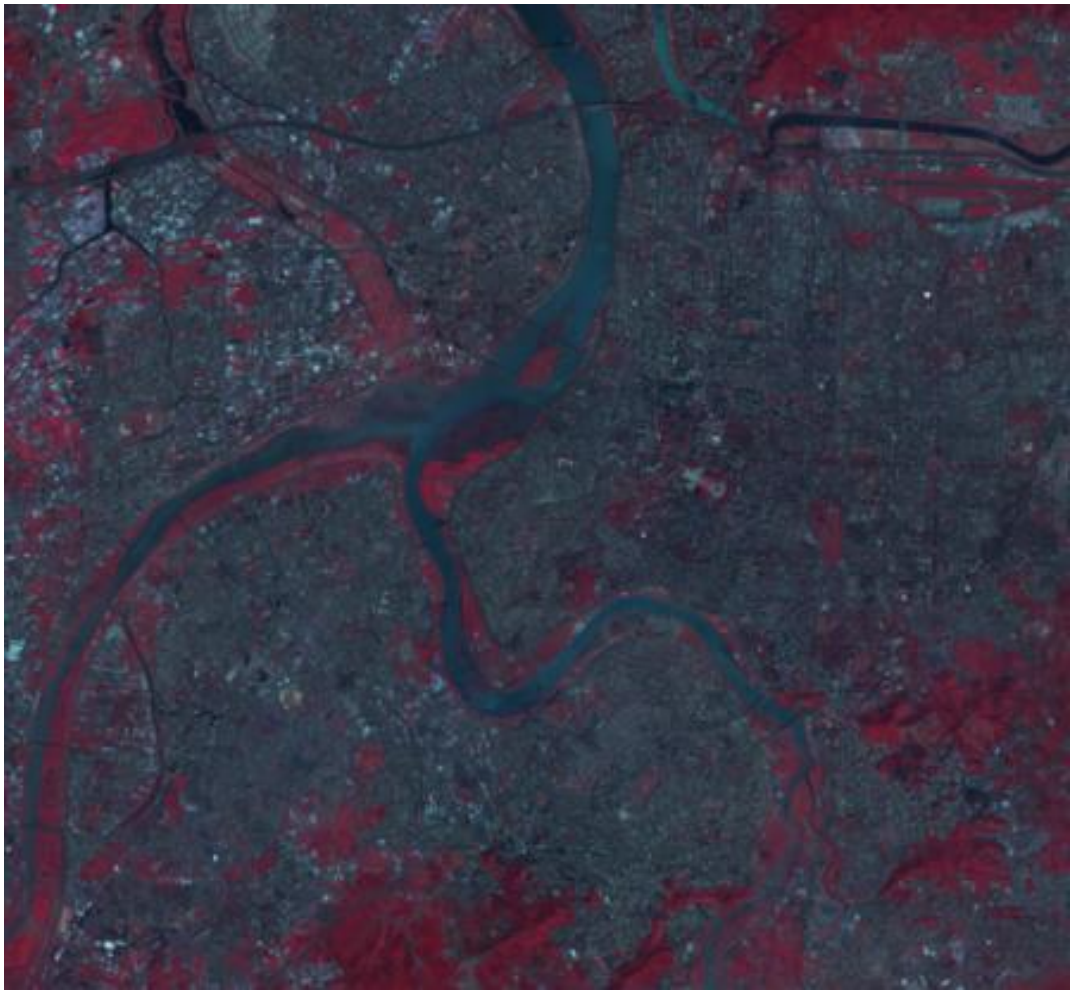


Patch Replacement Result

Experiment Results and Analysis

Result of information reconstruction

Data II - Urban area (Taipei, Taiwan)



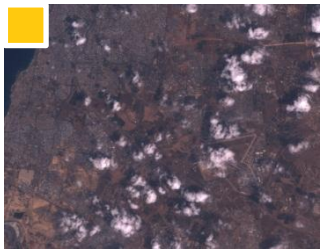
Our Result

Experiment Results and Analysis

Result of information reconstruction

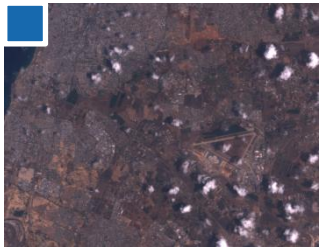
Data III - Urban area (Tel Aviv, Israel)

Target image (2002/04/09)



2000/08/25

2002/01/19

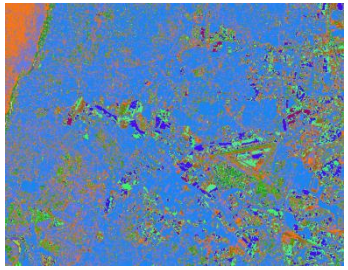


2002/07/14

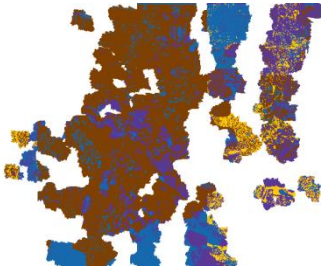
2002/10/18

Reference images

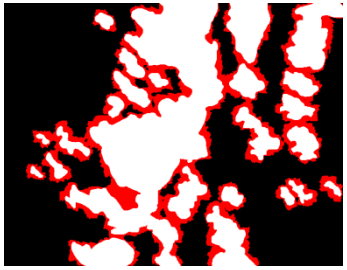
Detected cloud



Partition result



Cloning patches



Optimal Seam

Experiment Results and Analysis

Result of information reconstruction

Data III - Urban area (Tel Aviv, Israel)

Original Image

Experiment Results and Analysis

Result of information reconstruction

Data III - Urban area (Tel Aviv, Israel)

Patch Replacement Result

Experiment Results and Analysis

Result of information reconstruction

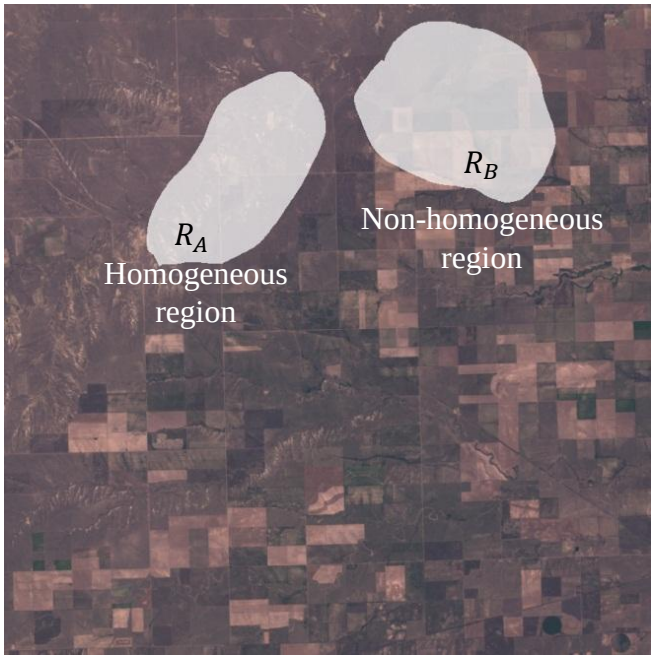
Data III - Urban area (Tel Aviv, Israel)

Our Result

Experiment Results and Analysis

Performance of the proposed approaches

Optimal Seam



Target Image

Reference Image

Method A: without optimal seam ; **Method A'** : with optimal seam

Quality Index		Red band		Green band		Blue band	
		RMSE	AD	RMSE	AD	RMSE	AD
R_A	Method A	4.22	-1.62	2.69	-1.14	2.44	-0.90
	Method A'	**4.04**	**-0.87**	**2.58**	**-0.83**	**2.40**	**-0.79**
R_B	Method A	13.75	1.81	8.49	0.60	7.37	0.65
	Method A'	**13.03**	**1.62**	**8.03**	**0.31**	**6.97**	**0.47**

Experiment Results and Analysis

Performance of the proposed approaches

Optimal Seam

Without Optimal Seam

Experiment Results and Analysis

Performance of the proposed approaches

Optimal Seam

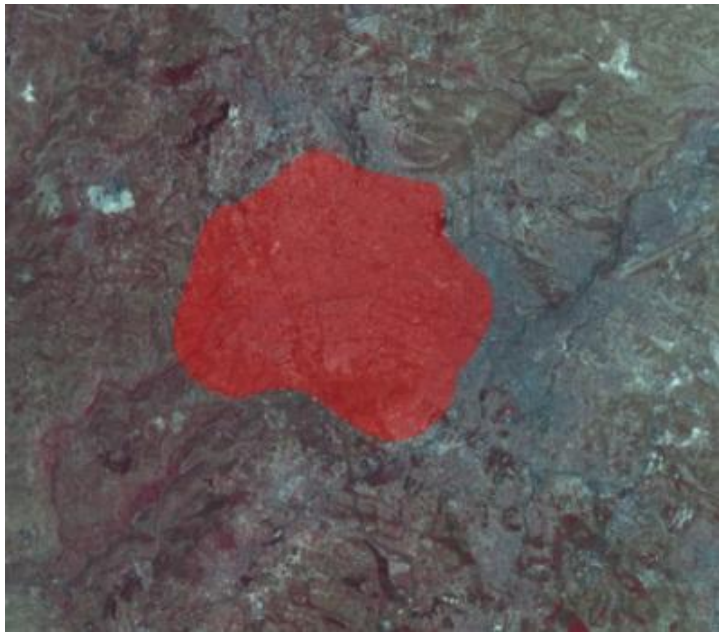
With Optimal Seam

Experiment Results and Analysis

Performance of the proposed approaches

Spatiotemporal Segmentation

Date I



Date II

Method B: without partition ; **Method B'** : with spatiotemporal segmentation (*k*=20)

Quality Index		Red band		Green band		Blue band	
		RMSE	AD	RMSE	AD	RMSE	AD
Case I	Method B	13.08	3.87	7.88	2.24	6.47	1.71
	Method B'	**11.58**	**2.07**	**7.38**	**1.33**	**5.88**	**0.90**
Case II	Method B	6.92	-1.26	11.22	-3.30	9.33	-2.19
	Method B'	**6.78**	**-1.22**	**9.93**	**-2.14**	**8.65**	**-1.45**

Experiment Results and Analysis

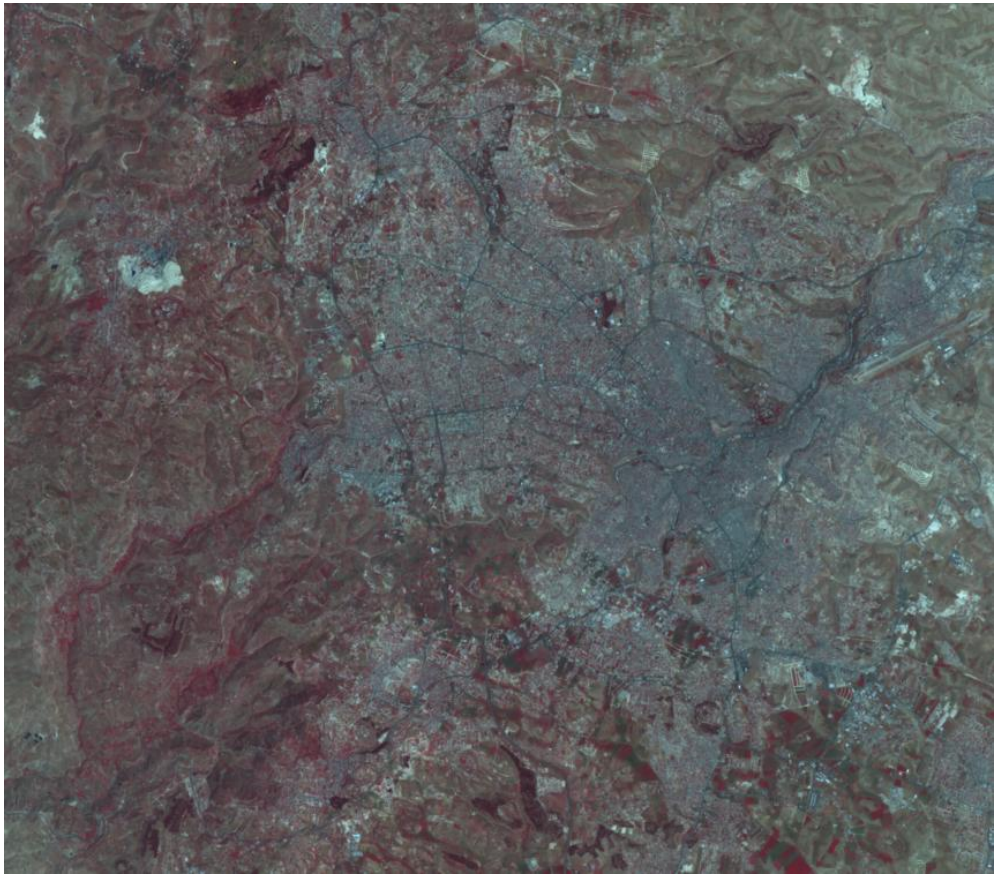
Performance of the proposed approaches

Spatiotemporal Segmentation

Date I

Original Image

Date II



Original Image

Experiment Results and Analysis

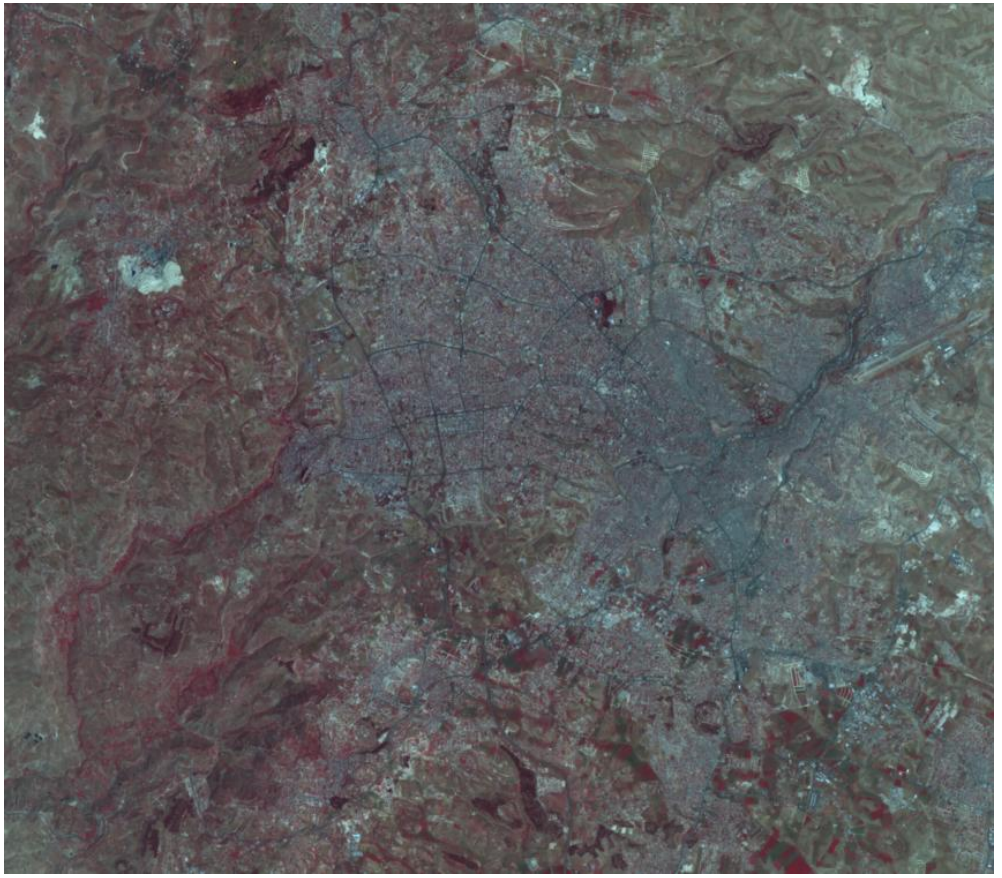
Performance of the proposed approaches

Spatiotemporal Segmentation

Date I

Without Partition

Date II



Without Partition

Experiment Results and Analysis

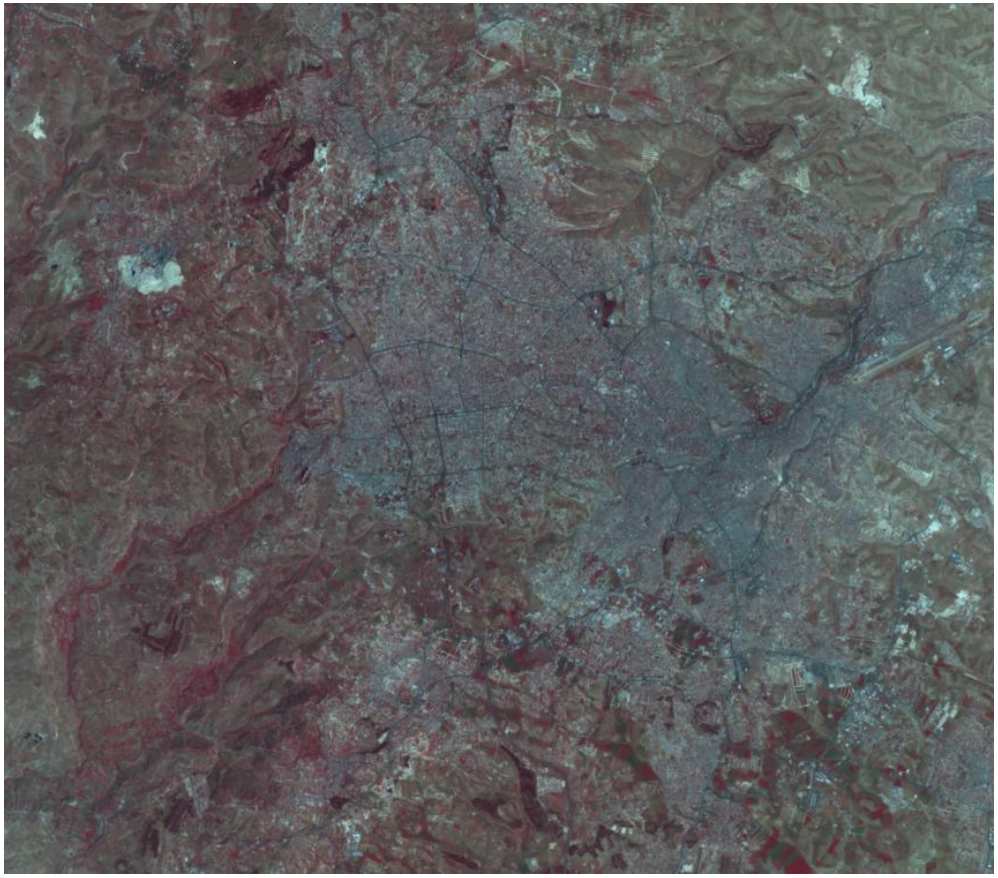
Performance of the proposed approaches

Spatiotemporal Segmentation

Date I

With Partition (k=20)

Date II



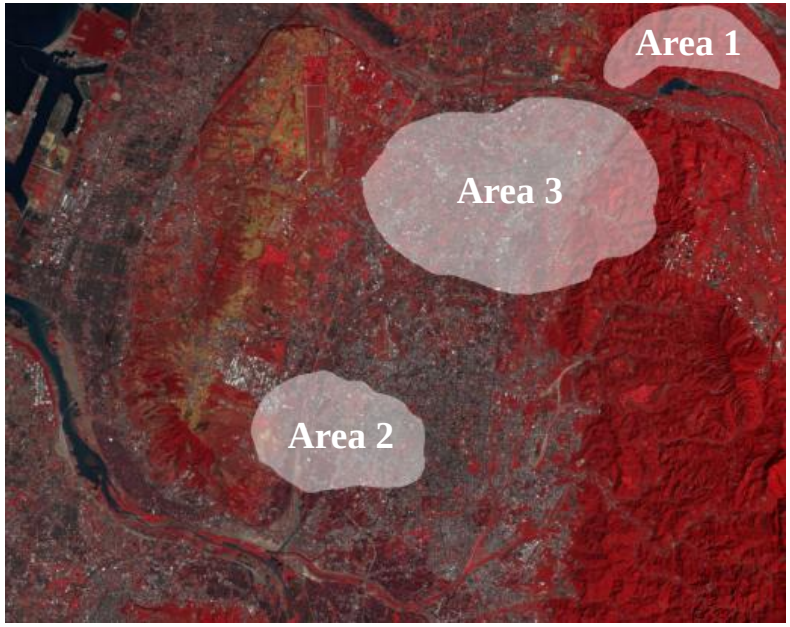
With Partition

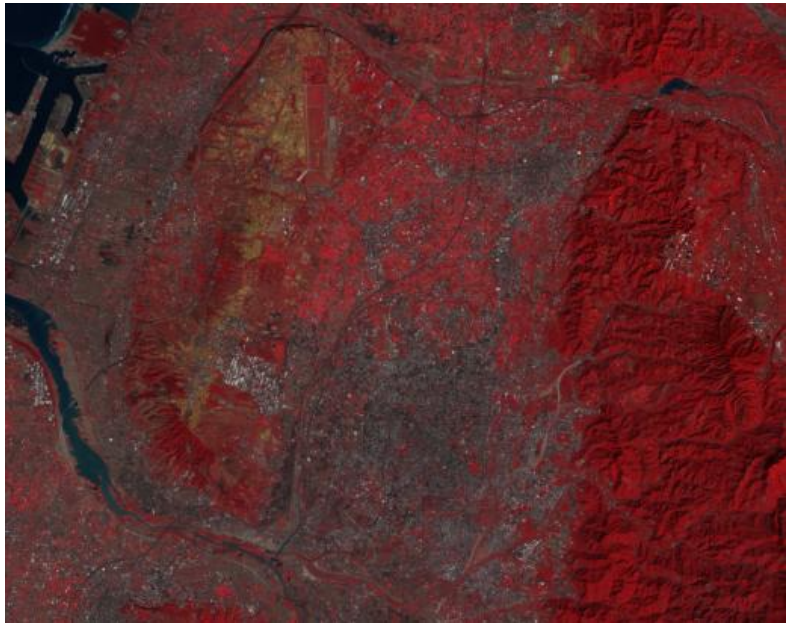
Comparisons

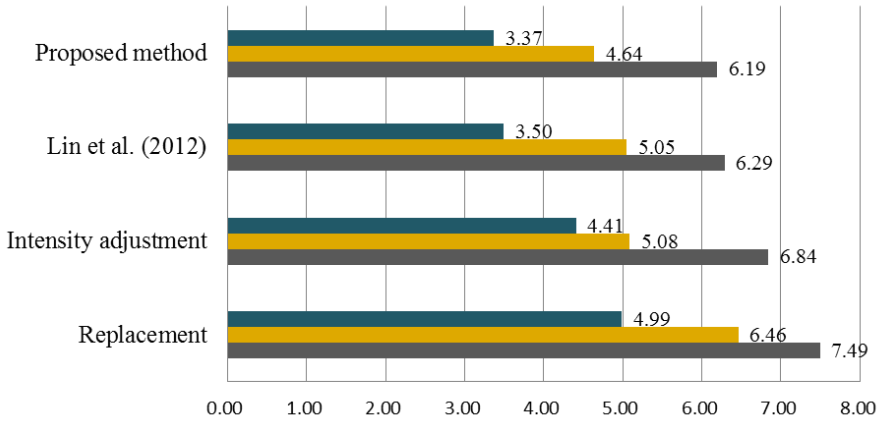
- **Comparison**
  - The proposed method
  - Lin et al. (2012)
  - Intensity adjustment
  - Patch replacement

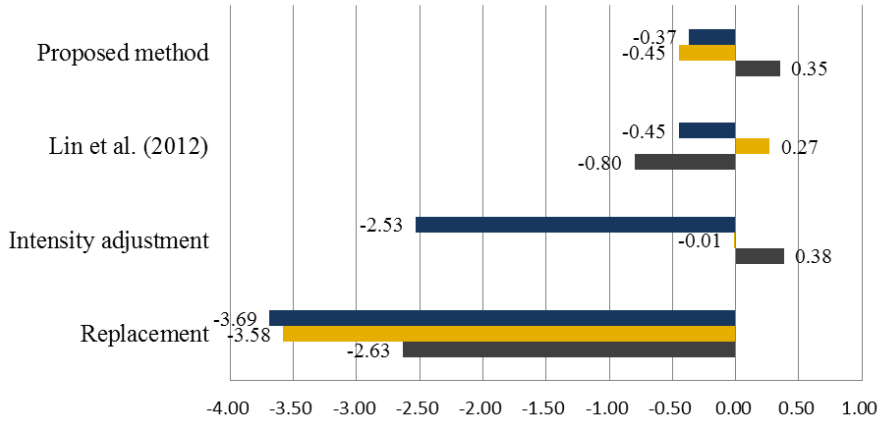
Experiment Results and Analysis

Comparisons



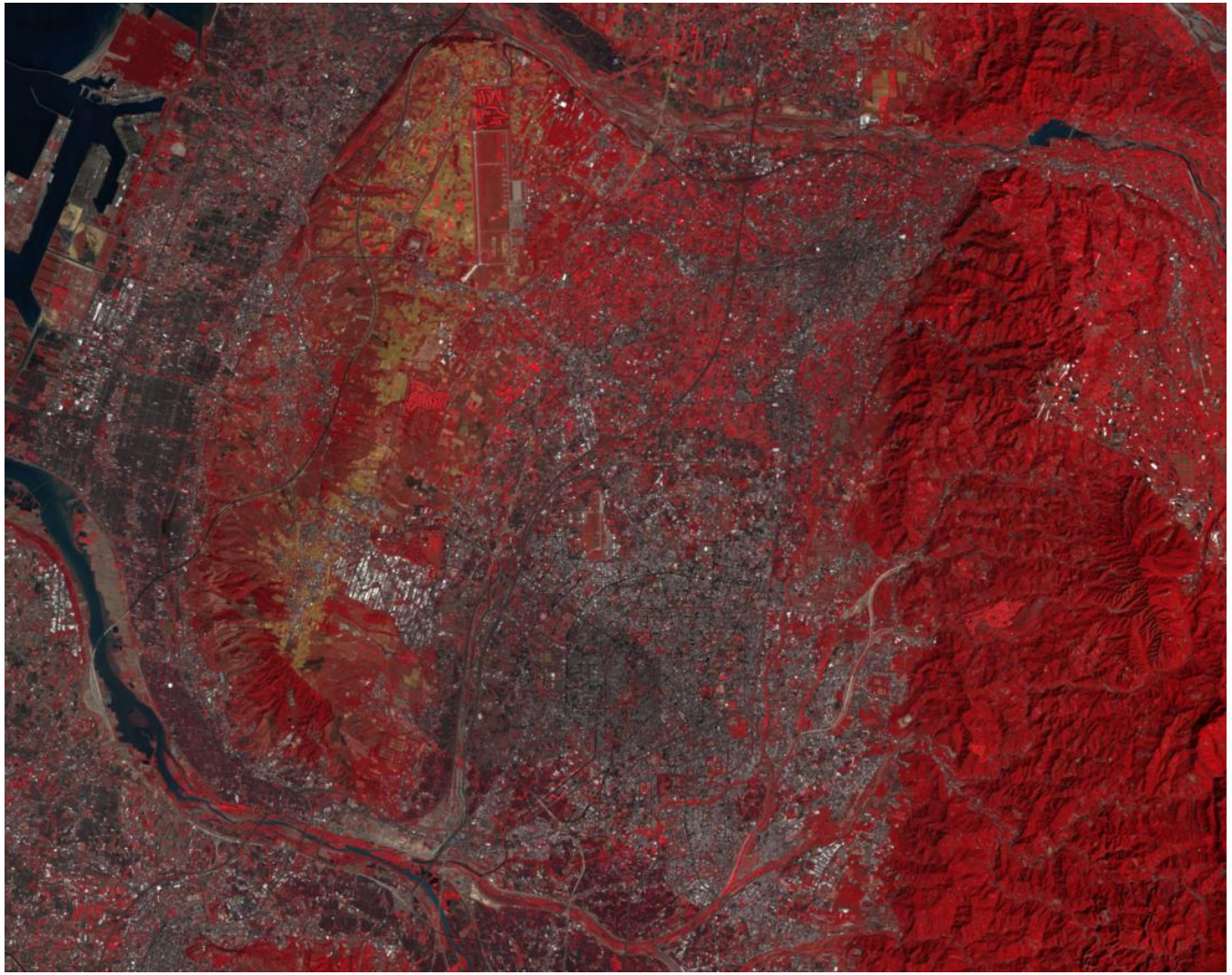






Experiment Results and Analysis

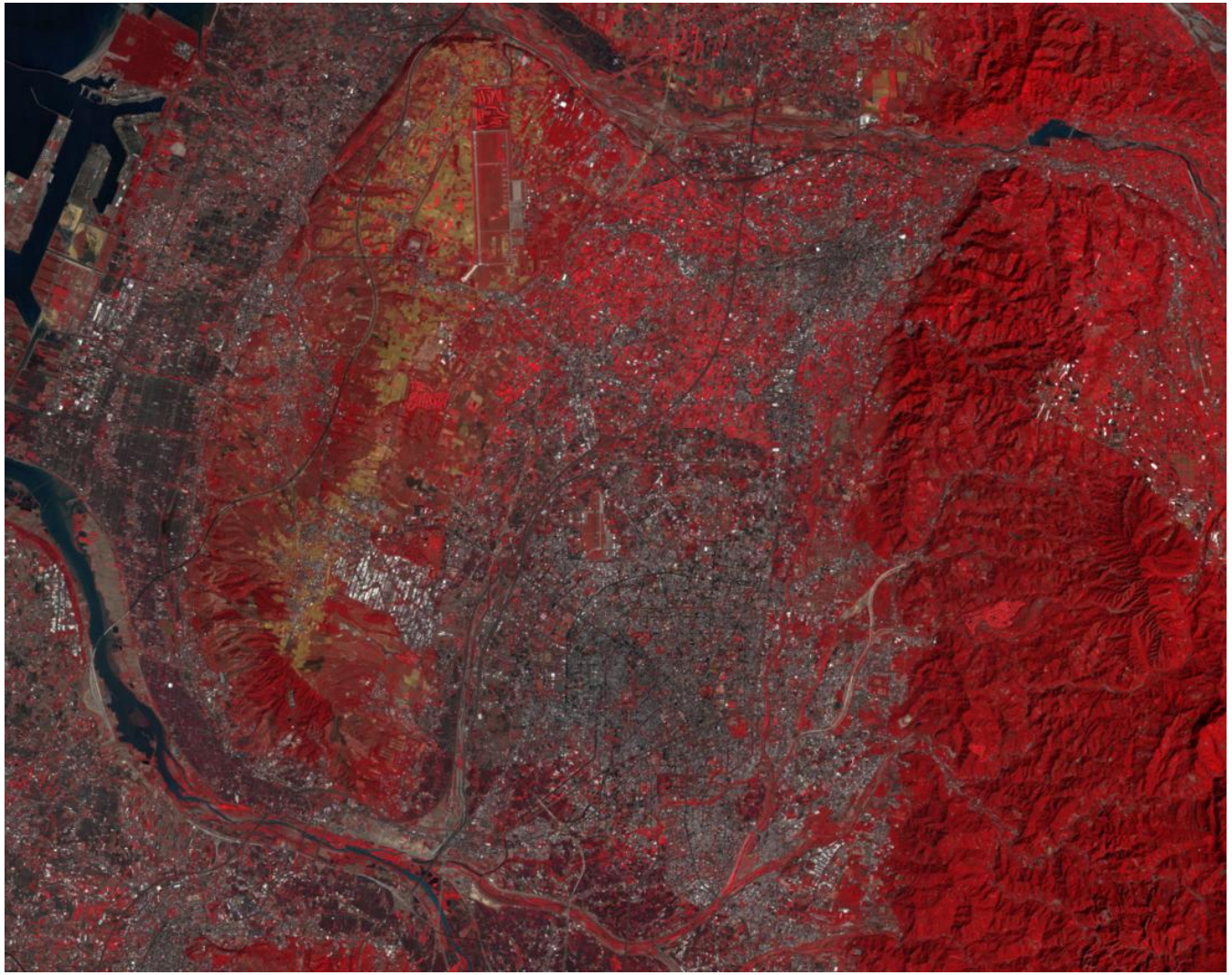
Comparisons



Patch replacement

Experiment Results and Analysis

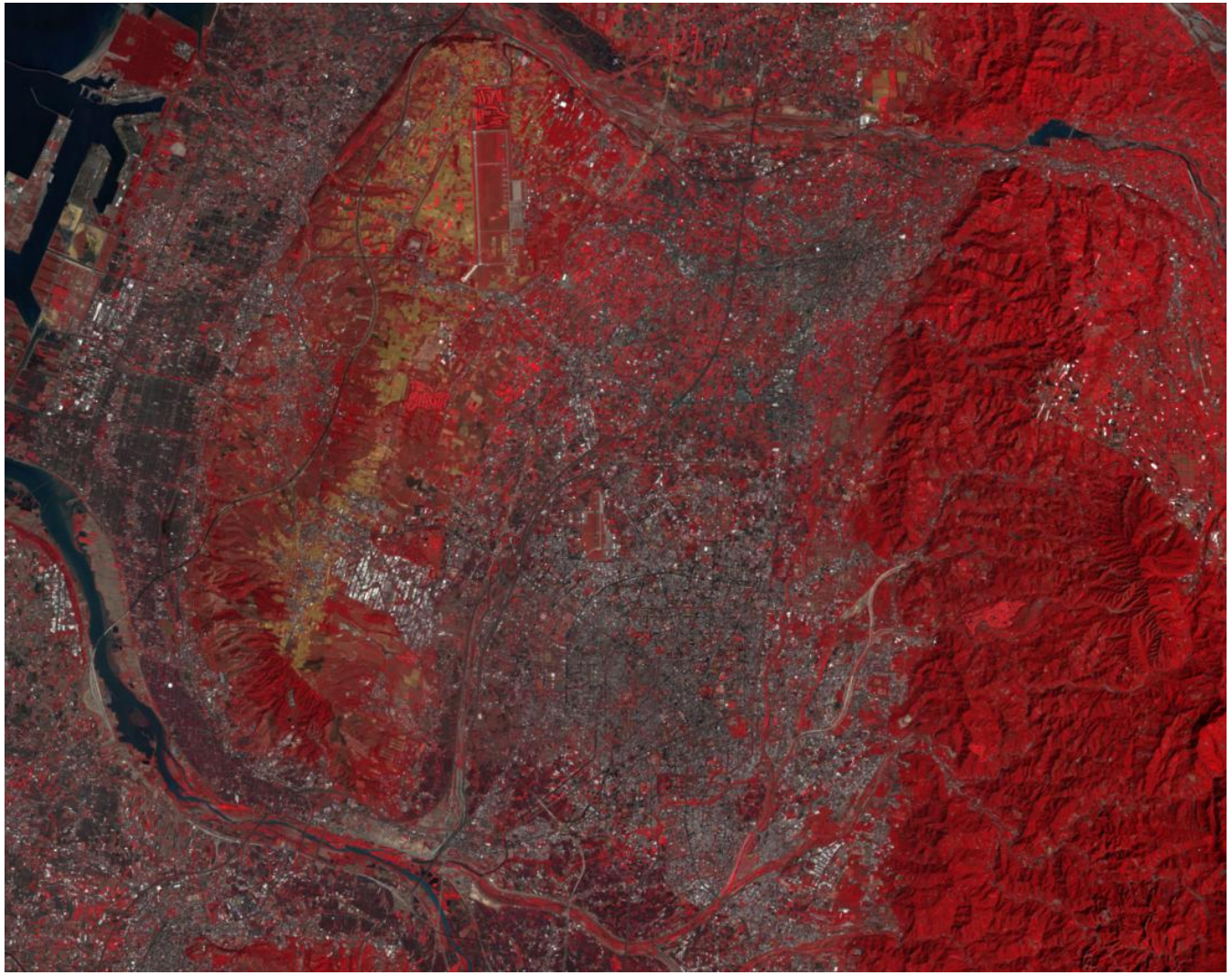
Comparisons



Intensity adjustment

Experiment Results and Analysis

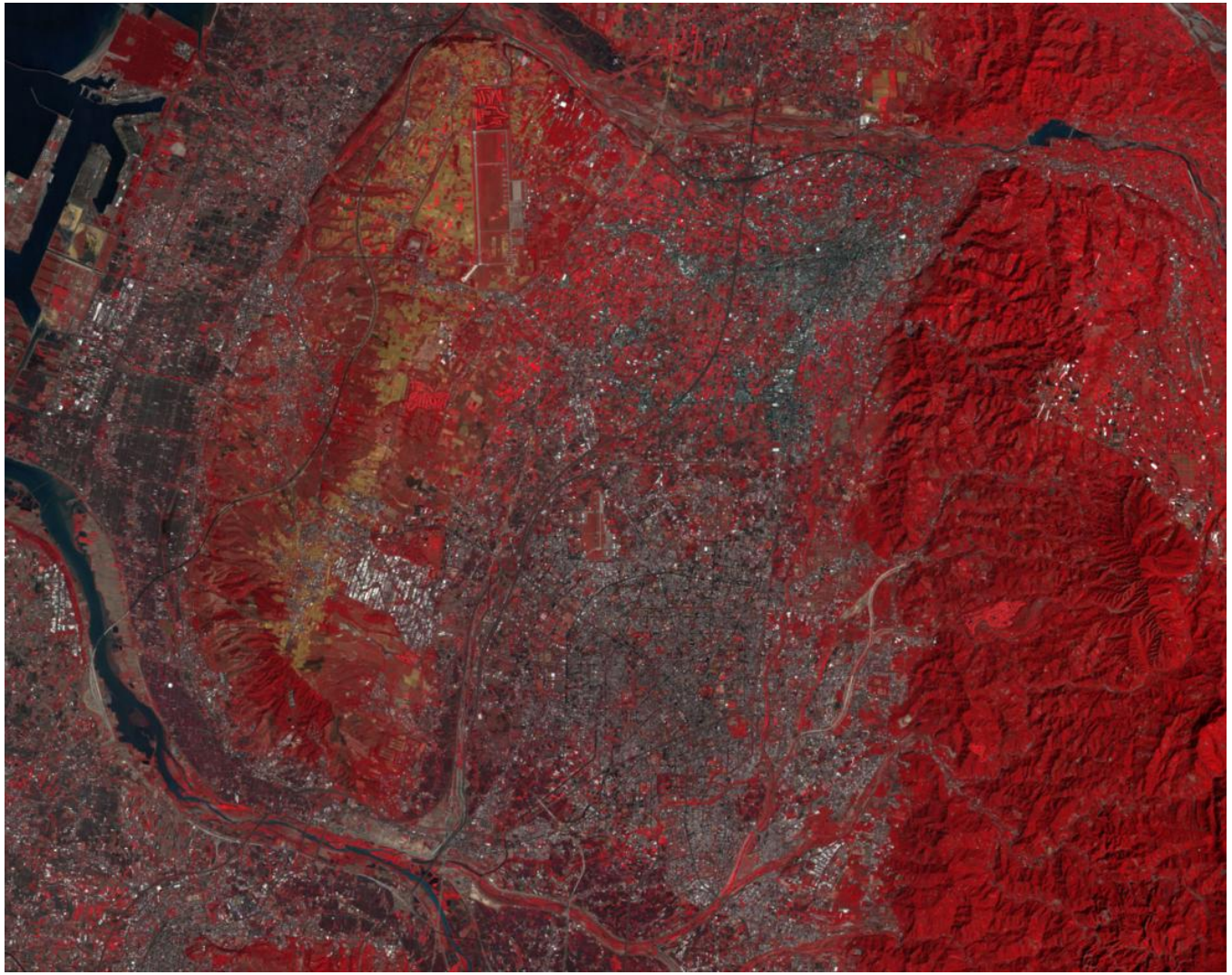
Comparisons



Lin et al. (2012)

Experiment Results and Analysis

Comparisons



Our Method

Thanks You