

**ANALISIS PERBANDINGAN METODE *PREWITT* DAN *SOBEL* PADA  
PROSES SEGMENTASI CITRA DIGITAL**

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Untuk memenuhi sebagian persyaratan

mencapai derajat Sarjana S-1

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Disusun Oleh

**MUHAMAD RAMADHAN**

**10650018**

**PROGRAM STUDI TEKNIK INFORMATIKA  
FAKULTAS SAINS DAN TEKNOLOGI  
UNIVERSITAS ISLAM NEGERI SUNAN KALIJAGA  
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Yang dipersiapkan dan disusun oleh :  
Nama : Muhamad Ramadhan  
NIM : 10650018  
Telah dimunaqasyahkan pada : Selasa, 10 Juni 2014  
Nilai Munaqasyah : A -  
Dan dinyatakan telah diterima oleh Fakultas Sains dan Teknologi UIN Sunan Kalijaga

**TIM MUNAQASYAH :**

Ketua Sidang

Shofwatul Uyun, M.Kom  
NIP. 19820511 200604 2 002

Penguji I

Nasirudin, M.Cs  
NIP.

Penguji II

Ade Ratnasari, M.T  
NIP. 19801217 200604 2 002

Yogyakarta, 18 Juni 2014  
UIN Sunan Kalijaga  
Fakultas Sains dan Teknologi  
Dekan



Prof. Drs. H. Akh. Minhaji, M.A, Ph.D  
NIP. 19580919 198603 1 002



### SURAT PERSETUJUAN SKRIPSI

Hal : Permohonan

Lamp : -

Kepada  
Yth. Dekan Fakultas Sains dan Teknologi  
UIN Sunan Kalijaga Yogyakarta  
di Yogyakarta

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Setelah membaca, meneliti, memberikan petunjuk dan mengoreksi serta mengadakan perbaikan seperlunya, maka kami selaku pembimbing berpendapat bahwa skripsi Saudara:

Nama : MUHAMAD RAMADHAN  
NIM : 10650018  
Judul Skripsi : ANALISIS PERBANDINGAN METODE *PREWITT* DAN  
*SOBEL* PADA PROSES SEGMENTASI CITRA DIGITAL

sudah dapat diajukan kembali kepada Program Studi Teknik Informatika Fakultas Sains dan Teknologi UIN Sunan Kalijaga Yogyakarta sebagai salah satu syarat untuk memperoleh gelar Sarjana Strata Satu dalam Program Studi Teknik Informatika

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Yogyakarta, 06 Juni 2014

Pembimbing,

Shofiwatul Uyun, ST., M.Kom.

NIP: 19820511 200604 2 002

## PERNYATAAN KEASLIAN SKRIPSI

Yang bertanda tangan di bawah ini :

Nama : Muhamad Ramadhan  
Nim : 10650018  
Program Studi : Teknik Informatika  
Fakultas : Sains dan Teknologi

Menyatakan bahwa skripsi dengan judul **ANALISIS PERBANDINGAN METODE *PREWITT* DAN *SOBEL* PADA PROSES SEGMENTASI CITRA DIGITAL** tidak terdapat pada karya yang pernah diajukan untuk memperoleh gelar sarjana di suatu Perguruan Tinggi dan sepengetahuan saya tidak terdapat karya atau pendapat yang pernah ditulis oleh orang lain, kecuali yang secara tertulis diacu dalam naskah ini disebutkan dalam daftar pustaka.

Yogyakarta, 06 Juni 2014

Yang Menyatakan



Muhamad Ramadhan

NIM : 10650018

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NIM : 10650018

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Fakultas Sains dan Teknologi

Universitas Islam Negeri Sunan Kalijaga

Yogyakarta

## MOTTO

*Orang yang berhasil akan mengambil manfaat dari  
kesalahan-kesalahannya dan mencoba lagi dalam suatu  
cara yang berbeda.*

*(Dale Carnegie)*





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# ANALISIS PERBANDINGAN METODE *PREWITT* DAN *SOBEL* PADA PROSES SEGMENTASI CITRA DIGITAL

MUHAMAD RAMADHAN

10650018

## INTISARI

Citra merupakan salah satu komponen multimedia yang memiliki peranan penting yaitu sebagai suatu bentuk informasi visual. Meskipun begitu, dalam proses pengambilan citra, terkadang mengalami penurunan mutu, misalnya mengandung derau (*noise*), kurang tajamnya sebuah citra dan sebagainya. Citra semacam ini menjadi lebih sulit diinterprestasikan sebagai citra digital untuk pengolahan lebih lanjut, oleh sebab itu pengolahan citra diperlukan supaya citra yang mengalami penurunan mutu tersebut dapat diproses dalam pengolahan citra lebih lanjut.

Segmentasi citra merupakan salah satu metode digital *image processing* (pengolahan citra digital) yang membagi citra ke dalam daerah intensitasnya masing-masing sehingga bisa membedakan antara objek dan *background*-nya. Penelitian ini menggunakan 4 jenis citra yaitu medis, real, sintesis dan aerial. Proses yang terdapat dalam penelitian ini yaitu *processing* dan analisis. Pada tahap *processing* dilakukan dengan segmentasi menggunakan metode *prewitt* dan *sobel*. Sedangkan tahap analisisnya dengan menggunakan 3 parameter pembandingan yaitu *timing run*, *signal to noise ratio* (SNR) dan histogram.

Percobaan dilakukan tanpa melalui proses *pre-processing* dengan maksud mendapatkan hasil analisis yang obyektif. Hasil percobaan pada keseluruhan citra didapat bahwa metode yang paling baik jika ditinjau dari parameter *SNR* dan histogram adalah metode *prewitt* untuk jenis citra medis, citra real, citra sintesis dan citra aerial. Sedangkan jika ditinjau dari parameter *timing run* metode yang paling baik adalah metode *sobel* untuk jenis citra medis, citra real dan citra sintesis, sedangkan untuk jenis citra aerial jika ditinjau dari segi *timing run* metode yang paling baik digunakan adalah metode *prewitt*.

**Kata Kunci** : Citra Segmentasi, Metode *Prewitt*, Metode *Sobel*, *Timing Run*,  
SNR, Histogram

**COMPARATIVE ANALYSIS BETWEEN METHOD *SOBEL* AND  
*PREWITT* ON DIGITAL IMAGE SEGMENTATION PROCESS**

**MUHAMAD RAMADHAN**

**10650018**

**ABSTRACT**

The image is one of the multimedia components that have an important role is as a form of visual information. Even so, the image retrieval process, sometimes severely degraded, for example, contains *noise (noise)*, a less sharp image, and so on. Such imagery is becoming more difficult to be interpreted as a digital image processing further, therefore the image processing is required in order to decrease the quality of the image can be processed in further image processing.

Segmentation image is one method of digital *image processing* that divides the image into regions so that the intensity of each can distinguish between the object and its *background*. This research using four image data that is medical image, real, synthesis and aerial. Process contained in this research that *processing* and analysis. At this stage of *processing* carried out by segmentation using method *prewitt* and *Sobel*. While the analysis phase by using three parameters comparison is *timing run*, *signal to noise ratio (SNR)* and histogram.

That Experiments were carried out without *pre-processing* in order to gain an objective analysis of the results. The experimental results obtained on the overall image that the best method if the terms of the SNR parameter and histogram is *prewitt* method for medical image types, real image, synthesis image and aerial image. Meanwhile, if the terms of the timing run parameters is the best method *sobel* for medical image types, real image and synthesis image, whereas for the type of aerial images when viewed in terms of the timing run is best used *prewitt* method.

**Keywords** : Image Segmentation, *Prewitt* Method, *Sobel* Method, *Timing Run*, SNR, Histogram



# BAB I

## PENDAHULUAN

### 1.1. LATAR BELAKANG

Citra atau image merupakan salah satu komponen multimedia yang memiliki peranan penting yaitu sebagai suatu bentuk informasi visual. Meskipun begitu, dalam proses pengambilan citra, terkadang mengalami penurunan mutu, misalnya mengandung derau (*noise*), kurang tajamnya sebuah citra dan sebagainya. Citra semacam ini menjadi lebih sulit diinterpretasikan untuk pengolahan citra digital lebih lanjut, oleh sebab itu pengolahan citra diperlukan supaya citra yang mengalami penurunan mutu tersebut dapat diinterpretasikan. Pengolahan citra yang sering dilakukan diantaranya penyaringan (*filtering*), penskalaan (*scaling*), *feature extraction*, *pattern recognition* atau *motion estimation* dan juga segmentasi citra. Segmentasi citra memiliki beberapa manfaat, misalnya di bidang kedokteran sebagai identifikasi penyakit diabetes mellitus melalui citra kelopak mata, dibidang pertanian untuk mengidentifikasi kematangan buah tomat dan dibidang telekomunikasi untuk pencarian database orang melalui foto orang (Kadir, 2103).

Salah satu teknik pengolahan citra adalah deteksi tepi (*edge detection*). Deteksi tepi sangat penting dalam pengolahan citra karena pendeteksian tepi mencirikan batas-batas objek dan karena itu tepi berguna untuk proses segmentasi dan identifikasi objek dalam citra. Tujuan operasi pendeteksi tepi adalah untuk meningkatkan penampakan garis batas suatu daerah atau objek di dalam citra dan. Menurut Hambali (2011) bahwa “Deteksi tepi yaitu proses untuk menentukan

lokasi titik-titik yang merupakan tepi obyek”. Disisi lain tepi sesungguhnya mengandung informasi yang sangat penting, informasi yang diperoleh dapat berupa bentuk maupun ukuran objek (Kadir, 2013).

Dalam penggunaannya, deteksi tepi menggunakan operator berbasis turunan pertama dan turunan kedua. Beberapa metode yang termasuk dalam operator berbasis turunan pertama diantaranya adalah metode *Roberts*, *Sobel* dan *Prewitt*. Sedangkan metode yang termasuk dalam operator berbasis turunan kedua diantaranya adalah *Laplacian of Gaussian* (LoG) dan *Canny*. Metode deteksi tepi yang akan dibahas pada penelitian ini adalah Metode *Prewitt* dan *Sobel*. Alasan digunakannya kedua metode tersebut, karena penelitian sebelumnya yang dilakukan oleh Amelia (2013) pernah menggunakan metode *Sobel* dibandingkan dengan metode *Robert*, tetapi kernel kedua metode berbeda. Hasil dari penelitian tersebut membuktikan bahwa metode *Sobel* menghasilkan citra lebih jelas dan pendeteksian tepi yang lebih jelas dibanding dengan metode *Robert*.

Penelitian ini mencoba membandingkan metode *Sobel* dengan metode yang memiliki kernel sama, yaitu metode *Prewitt* dengan berfokus pada analisis perbandingan metode mana yang lebih baik digunakan dalam pendeteksian tepi citra berdasarkan parameter waktu/kecepatan, distribusi penyebaran nilai intensitas pixel (*histogram*) dan *Signal to Noise Ratio* (*SNR*). Proses analisis menggunakan ketiga parameter tersebut, karena sering digunakan dalam analisis citra berdasarkan penelitian sebelumnya sehingga menghasilkan data yang akurat.

## 1.2. RUMUSAN MASSALAH

Berdasarkan latar belakang yang telah diuraikan, maka rumusan masalah dalam penelitian ini adalah bagaimana perbandingan kinerja antara metode *Prewitt* dan *Sobel* dalam proses segmentasi citra dengan parameter *timing run*, *Signal to Noise Ratio* (SNR) dan histogram.

## 1.3. BATASAN MASALAH

Penelitian ini memiliki batasan masalah agar pembahasan dan penyusunan penelitian dapat dilakukan secara terarah, sehingga tujuan penelitian dapat tercapai. Adapun batasan masalah dalam penelitian ini adalah :

1. Jenis citra digital yang digunakan adalah citra *grayscale*.
2. Data citra yang digunakan adalah citra medis, citra real, citra sintetis dan citra aerial.
3. Format citra yang digunakan berekstensi *\*.jpg* dan *\*.png* dengan resolusi antara *160x240 pixel* sampai *1600x987 pixel*.
4. Pengimplementasian aplikasi ini dibuat dengan menggunakan program Matlab versi 7.1
5. Penelitian ini tidak membahas proses pengambilan citra.

## 1.4. TUJUAN PENELITIAN

Adapun tujuan dari penelitian ini adalah untuk mengetahui perbandingan kinerja antara metode *Prewitt* dan *Sobel* dalam proses segmentasi citra dengan parameter *timing run*, *Signal to Noise Ratio* (SNR) dan histogram.

## **1.5. MANFAAT PENELITIAN**

Hasil-hasil dari penelitian ini diharapkan dapat memberikan manfaat:

1. Pada bidang ilmu pengolahan citra digital dapat digunakan sebagai acuan dalam menentukan metode-metode deteksi tepi yang paling cocok untuk keempat jenis citra pada proses segmentasi.
2. Pada pendidikan dapat digunakan sebagai bahan referensi dalam pengembangan IPTEK, khususnya pada pengembangan metode pendeteksian tepi citra dan pengembangan keilmuan pengolahan citra digital.

## **1.6. KEASLIAN SKRIPSI**

Penelitian mengenai segmentasi citra real, sintesis, aerial dan medis serta perbandingan metode segmentasi sudah pernah dilakukan. Akan tetapi, perlu penelitian lebih lanjut mengenai perbandingan metode segmentasi citra untuk mendapatkan metode segmentasi yang cocok digunakan pada citra real, sintesis, aerial dan medis dengan parameter pembanding untuk menganalisa citra tersebut.

## **1.7. SISTEMATIKA PENULISAN**

Untuk memberikan gambaran dan kerangka yang jelas mengenai pokok bahasan dalam setiap bab dalam penelitian ini, maka diperlukan sistematika penulisan. Berikut gambaran sistematika penulisan pada masing-masing bab:

### **BAB I : PENDAHULUAN**

Bab ini berisi latar belakang masalah, rumusan masalah, batasan masalah, tujuan penelitian, manfaat penelitian, keaslian skripsi, dan sistematika penulisan.

**BAB II : TINJUAN PUSTAKA**

Bab dua menjelaskan tentang tinjauan pustaka dan landasan teori yang berhubungan dengan permasalahan penelitian yang akan dibahas.

**BAB III : METODE PENELITIAN**

Pada bab ini akan dibahas tentang metodologi dari penelitian yang akan dilakukan serta jalannya penelitian ini.

**BAB IV : HASIL DAN PEMBAHASAN**

Meliputi hasil yang dicapai dari perancangan aplikasi sampai implementasi aplikasi sehingga dapat ditarik suatu kesimpulan.

**BAB V : PENUTUP**

Berisi kesimpulan dan saran berdasarkan hasil yang telah dicapai sehingga dapat digunakan sebagai bahan pertimbangan bagi pihak-pihak yang berkepentingan serta kemungkinan pengembangannya.



## **BAB V**

### **PENUTUP**

#### **5.1. KESIMPULAN**

Dari hasil simulasi dan analisis tentang pengolahan citra medis, citra real, citra sintesis dan citra aerial menggunakan metode *Prewitt* dan *Sobel* dengan parameter pembandingan *timing run*, SNR dan Histogram yang telah diuraikan, maka dapat ditarik kesimpulan bahwa metode yang paling baik jika ditinjau dari parameter *SNR* dan histogram adalah metode *prewitt* untuk jenis citra medis, citra real, citra sintesis dan citra aerial. Sedangkan jika ditinjau dari parameter *timing run* metode yang paling baik adalah metode *sobel* untuk jenis citra medis, citra real dan citra sintesis, sedangkan untuk jenis citra aerial jika ditinjau dari segi *timing run* metode yang paling baik digunakan adalah metode *prewitt*.

#### **5.2.SARAN**

Algoritma yang dirancang masih dapat dikembangkan lebih jauh lagi untuk memperoleh hasil yang lebih baik. Beberapa hal yang perlu dikembangkan untuk penelitian lebih lanjut antara lain :

1. Mencoba dengan banyak metode deteksi tepi lainnya sehingga dapat mengetahui apakah ada metode segmentasi yang lebih baik lagi untuk memproses citra medis, citra real, citra sintesis dan citra aerial.
2. Pengujian algoritma sebaiknya dikembangkan dengan menggunakan lebih banyak data serta piranti pengujian, baik perangkat lunak maupun perangkat keras yang lebih baik.

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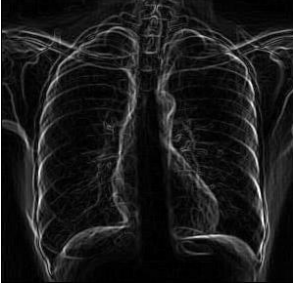
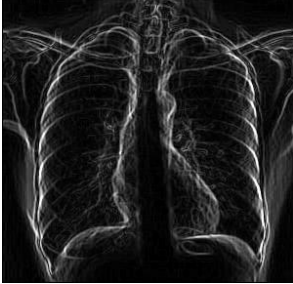









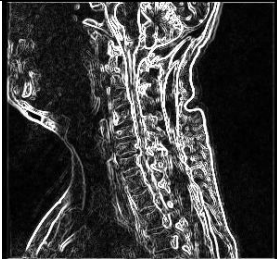





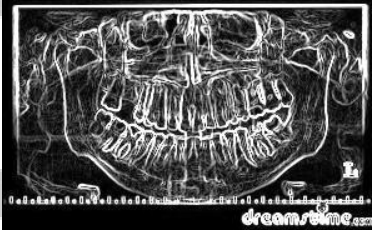






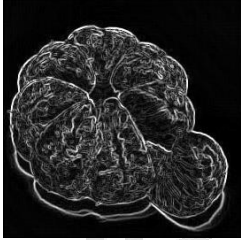
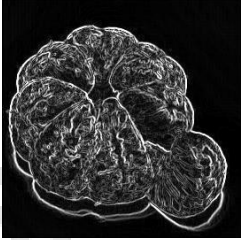
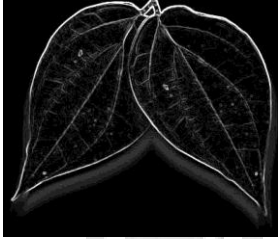
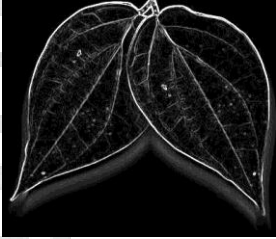










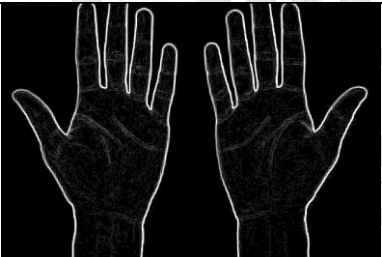
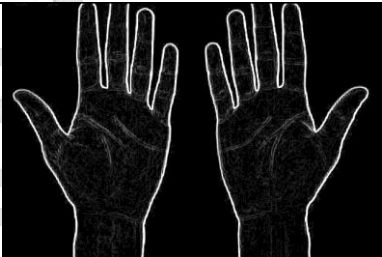
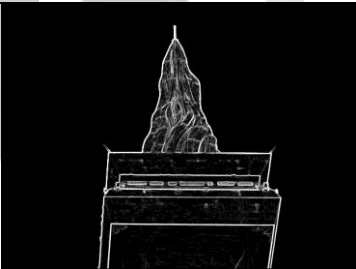
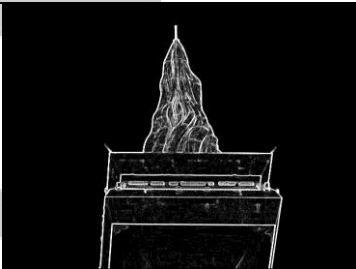
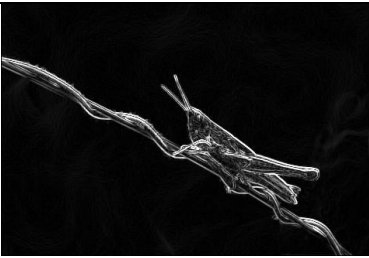
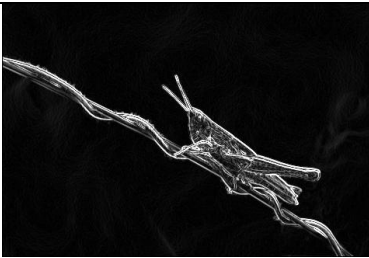
**LAMPIRAN 1**  
**Hasil *Processing* Segmentasi Citra**

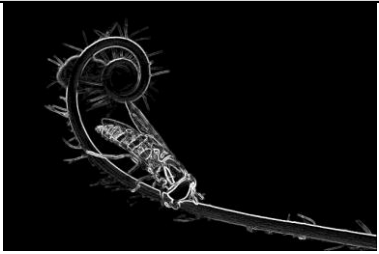
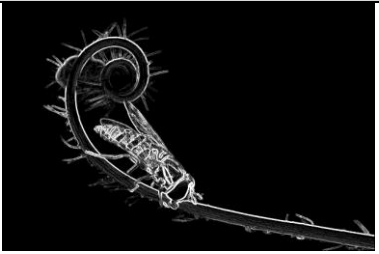
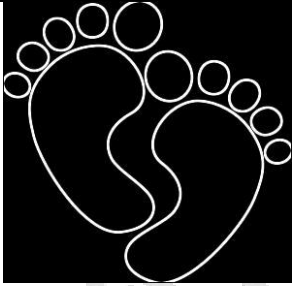



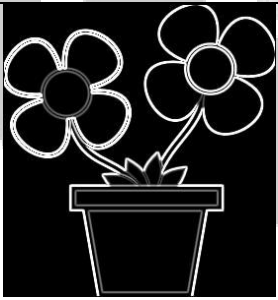
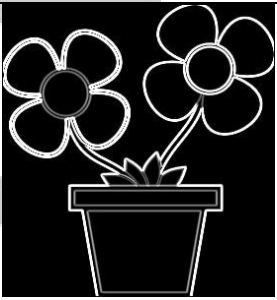
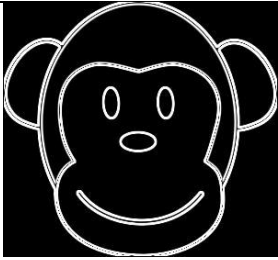
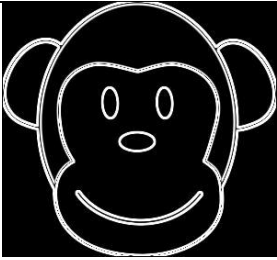
### Hasil Citra *Processing*

No	Jenis Citra	Hasil <i>Processing</i>	
		Citra Hasil <i>Prewitt</i>	Citra Hasil <i>Sobel</i>
1	Citra Medis		
2	Citra Medis		
3	Citra Medis		
4	Citra Medis		

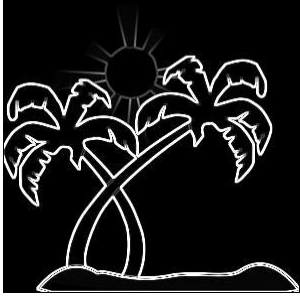
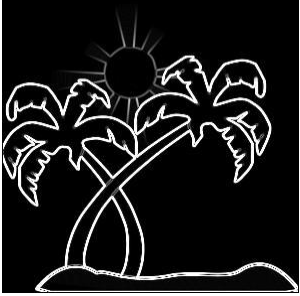
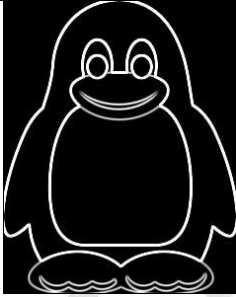
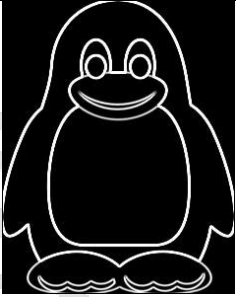

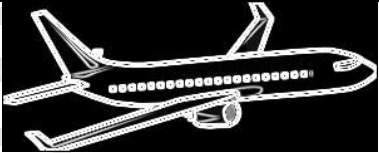



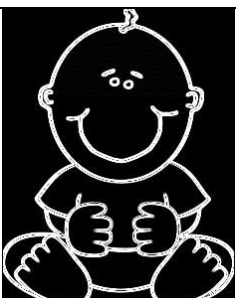
No	Jenis Citra	Hasil Processing	
		Citra Hasil Prewitt	Citra Hasil Sobel
5	Citra Medis		
6	Citra Medis		
7	Citra Medis		
8	Citra Medis		
9	Citra Medis		




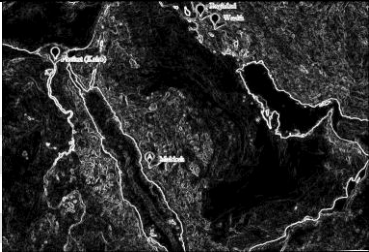


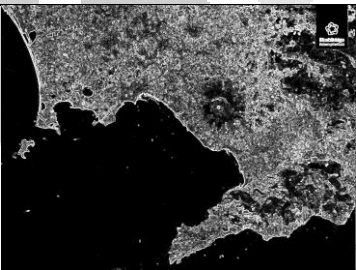
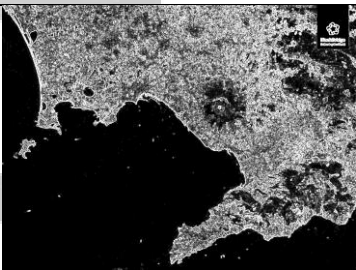
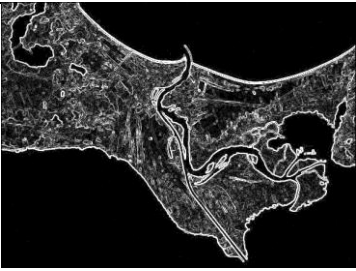
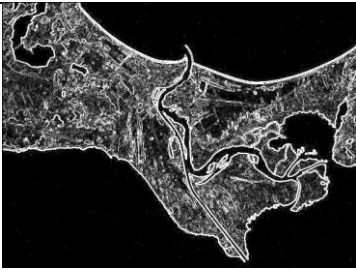
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		Citra Hasil Prewitt	Citra Hasil Sobel
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11	Citra Real		
12	Citra Real		
13	Citra Real		
14	Citra Real		

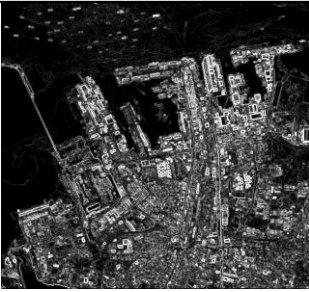

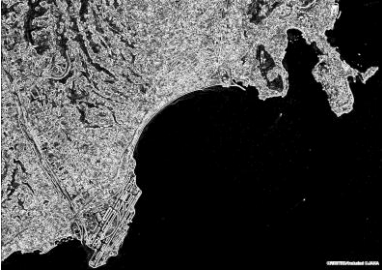
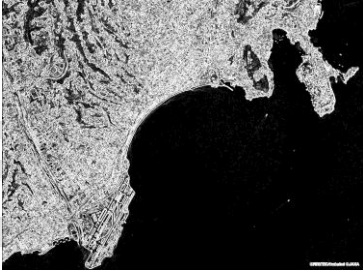


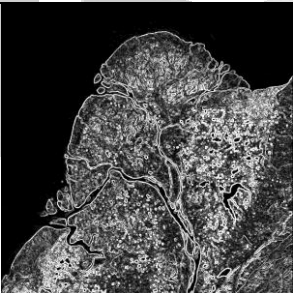
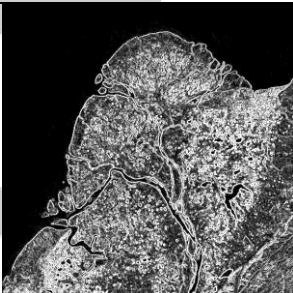


No	Jenis Citra	Hasil Processing	
		Citra Hasil Prewitt	Citra Hasil Sobel
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16	Citra Real		
17	Citra Real		
18	Citra Real		
19	Citra Real		

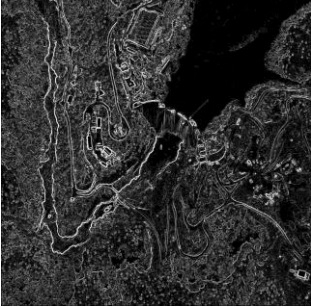
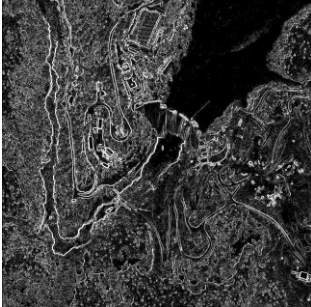
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		Citra Hasil Prewitt	Citra Hasil Sobel
20	Citra Real		
21	Citra Sintesis		
22	Citra Sintesis		
23	Citra Sintesis		
24	Citra Sintesis		



No	Jenis Citra	Hasil Processing	
		Citra Hasil Prewitt	Citra Hasil Sobel
25	Citra Sintesis		
26	Citra Sintesis		
27	Citra Sintesis		
28	Citra Sintesis		
29	Citra Sintesis		

No	Jenis Citra	Hasil Processing	
		Citra Hasil Prewitt	Citra Hasil Sobel
30	Citra Sintesis		
31	Citra Aerial		
32	Citra Aerial		
33	Citra Aerial		
34	Citra Aerial		

No	Jenis Citra	Hasil Processing	
		Citra Hasil Prewitt	Citra Hasil Sobel
35	Citra Aerial		
36	Citra Aerial		
37	Citra Aerial		
38	Citra Aerial		
39	Citra Aerial		



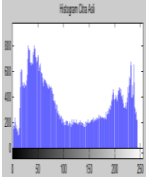
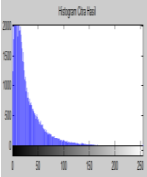
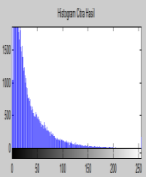


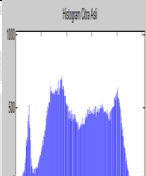
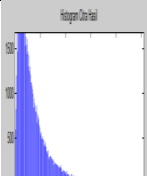
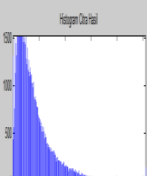

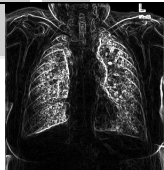
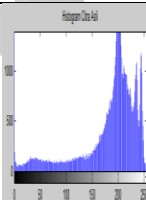
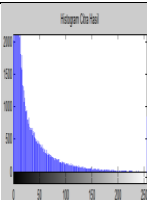
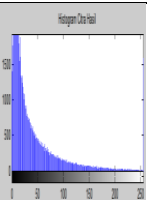
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		Citra Hasil <i>Prewitt</i>	Citra Hasil <i>Sobel</i>
40	Citra Aerial		



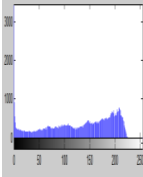
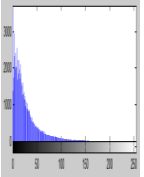
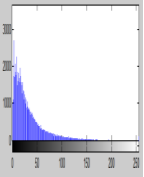


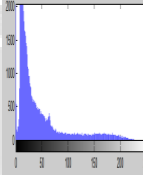
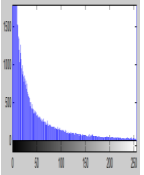
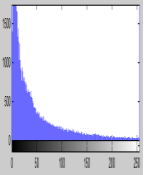
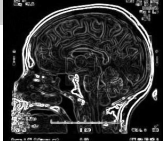

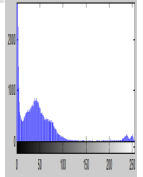
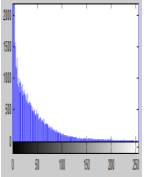
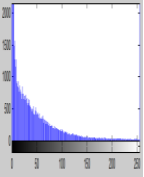


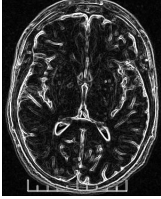
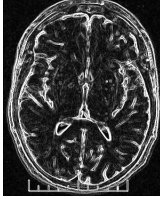
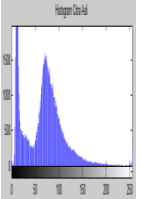
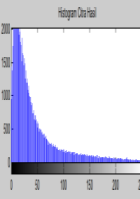
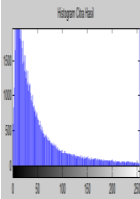


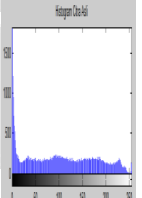
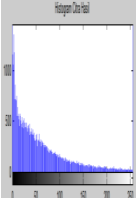
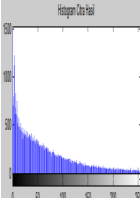
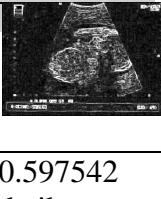
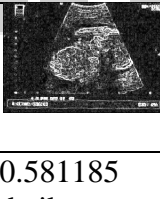
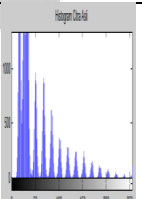
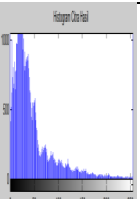
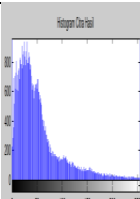


**LAMPIRAN 2**  
**Hasil Analisis Citra**



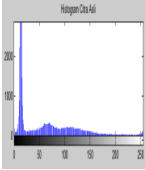
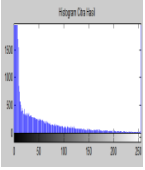
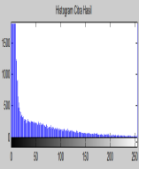
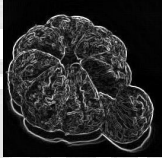
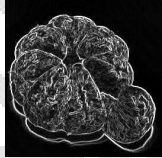
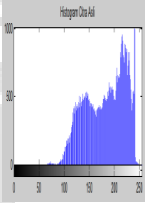
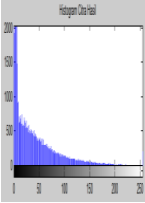
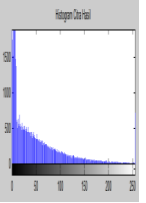


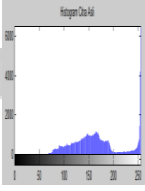
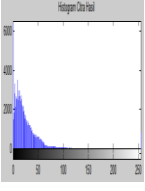
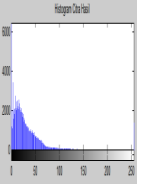
### Hasil Analisis Citra



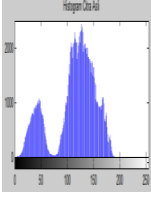
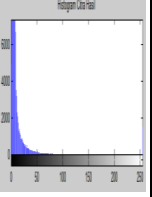
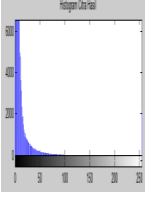


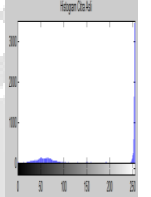
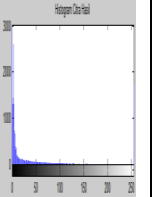
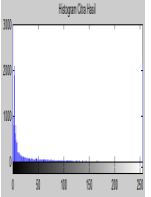

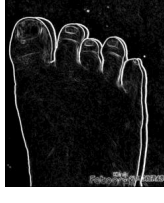
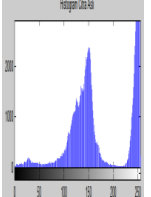
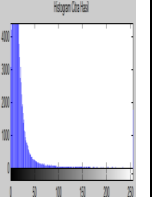
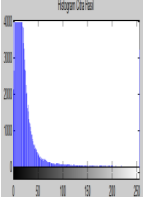
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
1	Citra Medis	Citra					
		Timing run	0.620319 Detik	0.582092 detik			
		SNR (dB)	9.27924	8.35389			
2	Citra Medis	Citra					
		Timing run	0.658995 detik	0.623976 detik			
		SNR (dB)	9.04492	8.09154			
3	Citra Medis	Citra					
		Timing run	0.633582 detik	0.593858 detik			
		SNR (dB)	7.44364	6.78345			



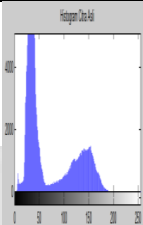
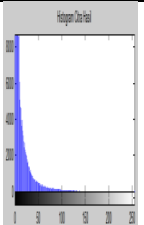
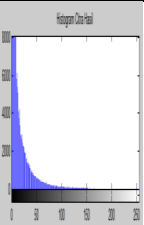


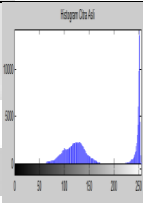
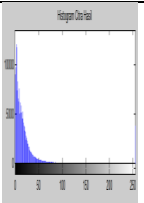
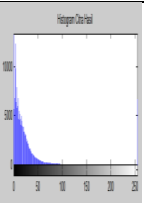
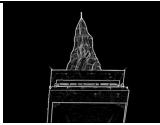
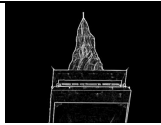
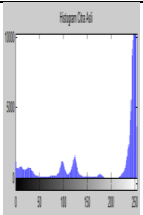
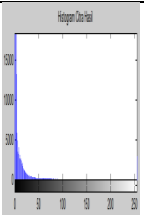
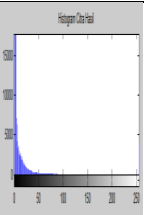
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
4	Citra Medis	Citra					
		Timing run	0.592444 detik	0.607379 detik			
		SNR (dB)	9.03323	8.40554			
5	Citra Medis	Citra					
		Timing run	0.61125 detik	0.595859 detik			
		SNR (dB)	5.82329	5.36674			
6	Citra Medis	Citra					
		Timing run	0.580431 detik	0.585016 detik			
		SNR (dB)	5.86973	5.55933			

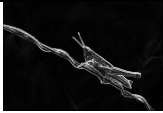
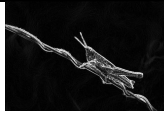
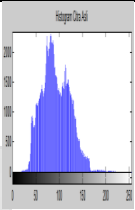
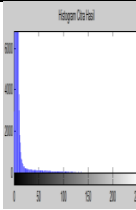
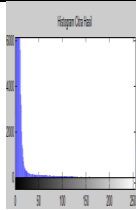


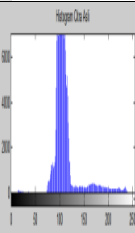
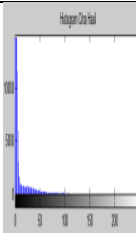
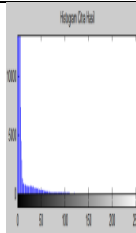

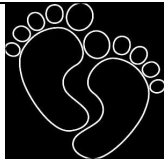
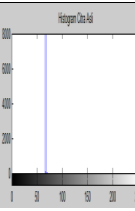
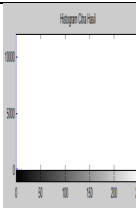
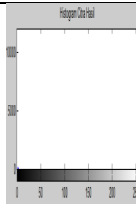
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
7	Citra Medis	Citra					
		Timing run	0.60138 detik	0.600458 detik			
		SNR (dB)	6.21585	5.72178			
8	Citra Medis	Citra					
		Timing run	0.632438 detik	0.624201 detik			
		SNR (dB)	5.54871	5.1168			
9	Citra Medis	Citra					
		Timing run	0.597542 detik	0.581185 detik			
		SNR (dB)	6.72441	6.39645			



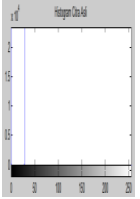
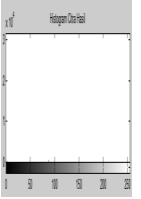

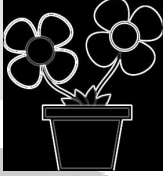

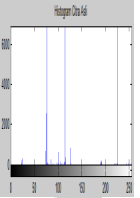
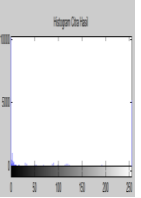
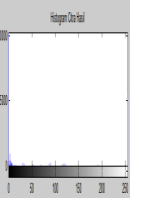
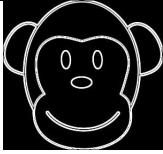
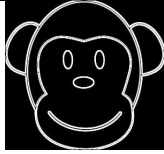
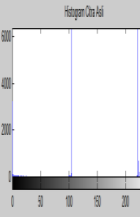
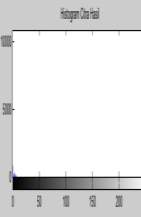
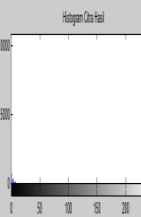




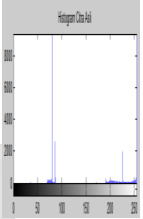
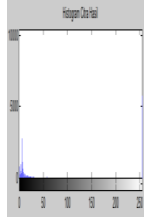
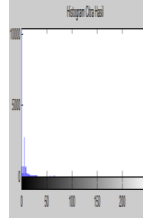
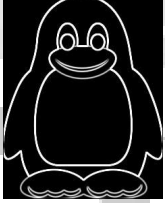
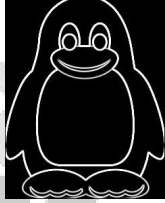
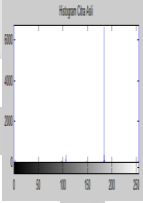
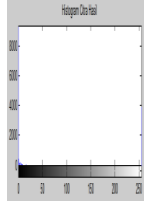
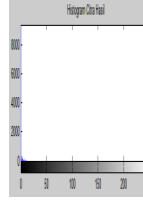


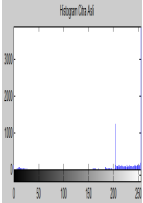
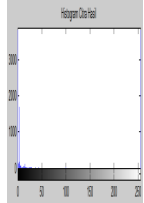
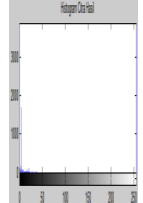
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
10	Citra Medis	Citra					
		Timing run	0.609999 detik	0.577999 detik			
		SNR (dB)	5.60257	5.34666			
11	Citra Real	Citra					
		Timing run	0.563107 detik	0.553452 detik			
		SNR (dB)	7.5399	6.72355			
12	Citra	Citra					
		Timing run	0.639154 detik	0.662095 detik			
		SNR (dB)	8.60408	8.05712			



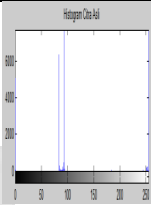
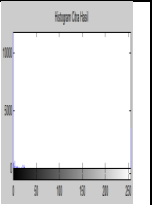
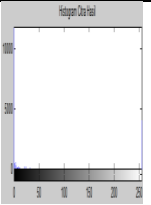


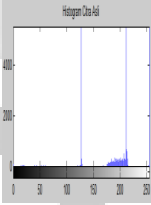
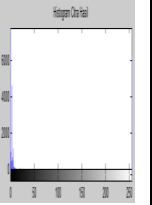
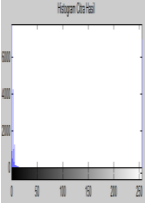


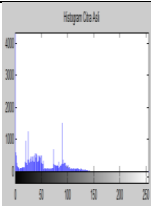
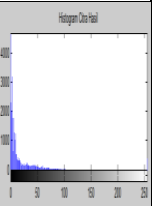
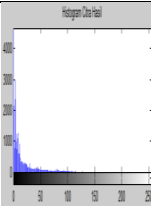
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
13	Citra Real	Citra					
		Timing run	0.710911 detik	0.687596 detik			
		SNR (dB)	8.93032	8.52275			
14	Citra Real	Citra					
		Timing run	0.566897 detik	0.624574 detik			
		SNR (dB)	5.97874	5.68464			
15	Citra Real	Citra					
		Timing run	0.68422 detik	0.700332 detik			

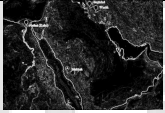
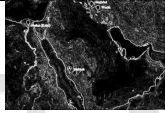
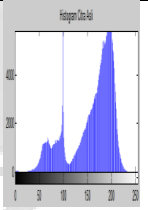
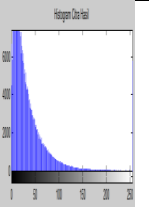
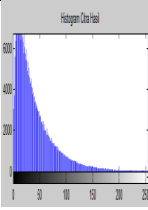


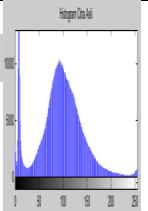
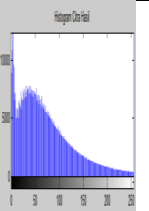
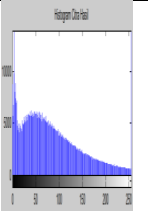
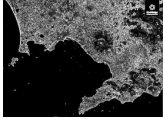
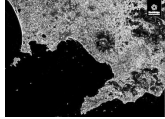
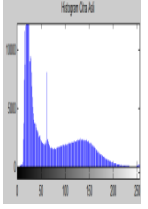
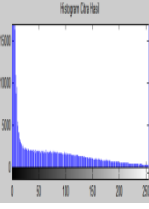
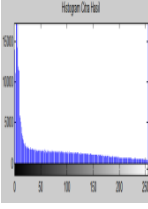
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
		SNR (dB)	8.06313	7.55673			
16	Citra Real	Citra					
		Timing run	0.832128 detik	0.752896 detik			
		SNR (dB)	9.67519	8.70878			
17	Citra Real	Citra					
		Timing run	0.763508 detik	0.764996 detik			
		SNR (dB)	7.71602	7.22955			
18	Citra Real	Citra					
		Timing run	0.774984 detik	0.82895 detik			

No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
		SNR (dB)	8.34233	7.9569			
19	Citra Real	Citra					
		Timing run	0.826178 detik	0.648307 detik			
		SNR (dB)	8.74357	8.2544			
20	Citra Real	Citra					
		Timing run	0.759656 detik	0.781763 detik			
		SNR (dB)	8.63632	8.07522			
21	Citra Sintesis	Citra					
		Timing run	0.581514 detik	0.578462 detik			
		SNR (dB)	6.1514	6.12768			

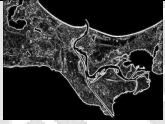
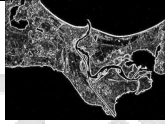
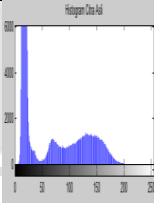
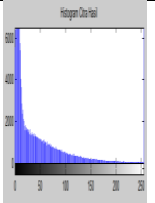
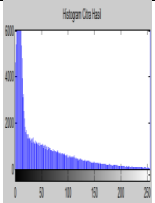
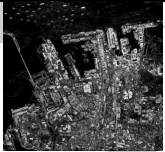
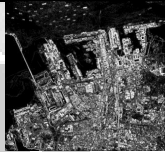
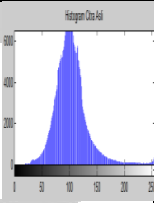
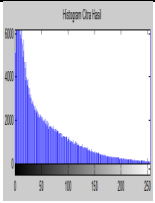
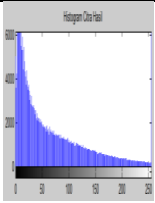
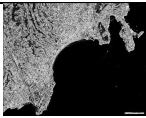
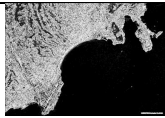
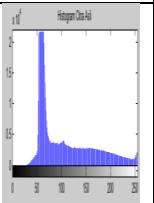
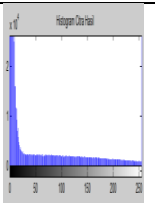
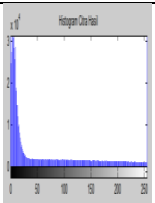
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
22	Citra Sintesis	Citra					
		Timing run	0.865565 detik	0.771122 detik			
		SNR (dB)	8.86576	9.9669			
23	Citra Sintesis	Citra					
		Timing run	0.605107 detik	0.594347 detik			
		SNR (dB)	5.6566	5.56776			
24	Citra Sintesis	Citra					
		Timing run	0.742339 detik	0.628775 detik			

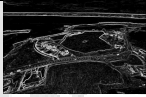

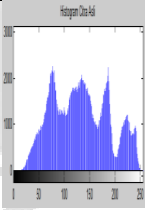
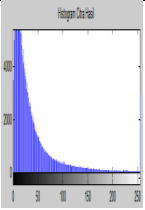
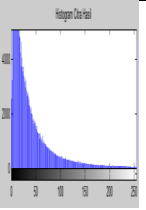
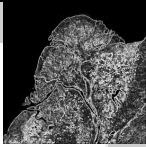
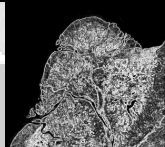
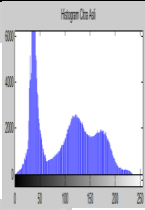
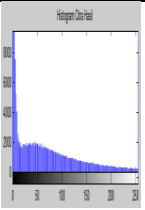
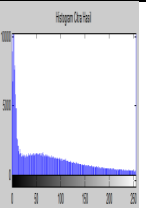
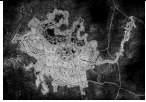

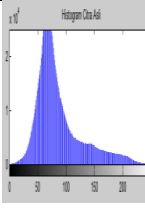
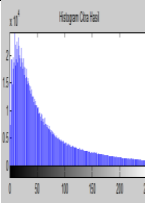
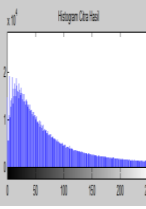
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
		SNR (dB)	5.31205	5.24384			
25	Citra Sintesis	Citra					
		Timing run	0.595992 detik	0.673206 detik			
		SNR (dB)	5.68834	5.63415			
26	Citra Sintesis	Citra					
		Timing run	0.701374 detik	0.585506 detik			
		SNR (dB)	5.79938	5.71396			
27	Citra Sintesis	Citra					
		Timing run	0.536302 detik	0.59767 detik			

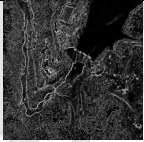
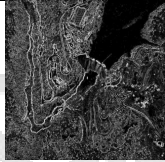
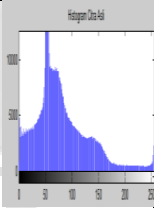
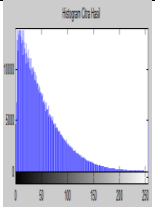
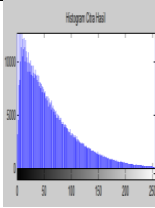
No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
		SNR (dB)	4.40285	4.34742			
28	Citra Sintesis	Citra					
		Timing run	0.719085 detik	0.589465 detik			
		SNR (dB)	6.50115	6.40243			
29	Citra Sintesis	Citra					
		Timing run	0.597206 detik	0.572278 detik			
		SNR (dB)	5.06373	4.94906			
30	Citra Sintesis	Citra					

No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
		Timing run	0.689252 detik	0.591156 detik			
		SNR (dB)	8.26623	7.74032			
31	Citra Aerial	Citra					
		Timing run	0.992157 detik	0.852498 detik			
		SNR (dB)	7.54258	7.01093			
32	Citra Aerial	Citra					
		Timing run	1.36289 detik	1.30685 detik			
		SNR (dB)	5.94276	5.4224			
33	Citra Aerial	Citra					
		Timing run					
		SNR (dB)					



No	Jenis Citra	Nilai	<i>Processing</i>				
			<i>Prewitt</i>	<i>Sobel</i>	Histogram		
					Citra Asli	Citra Hasil <i>Prewitt</i>	Citra Hasil <i>Sobel</i>
		Timing run	1.0515 detik	1.19366 detik			
		SNR (dB)	5.35752	4.72777			
34	Citra Aerial	Citra					
		Timing run	0.784129 detik	0.731616 detik			
		SNR (dB)	6.20975	5.67507			
35	Citra Aerial	Citra					
		Timing run	0.821942 detik	1.03702 detik			
		SNR (dB)	6.1049	5.49382			
36	Citra Aerial	Citra					
		Timing run					
		SNR (dB)					

No	Jenis Citra	Nilai	Processing				
			Prewitt	Sobel	Histogram		
					Citra Asli	Citra Hasil Prewitt	Citra Hasil Sobel
		Timing run	1.3972 detik	1.41668 detik			
		SNR (dB)	4.62275	4.18208			
37	Citra Aerial	Citra					
		Timing run	0.764307 detik	0.916153 detik			
		SNR (dB)	7.16968	6.81099			
38	Citra Aerial	Citra					
		Timing run	0.868895 detik	0.858626 detik			
		SNR (dB)	5.27567	4.73318			
39	Citra Aerial	Citra					

No	Jenis Citra	Nilai	<i>Processing</i>				
			<i>Prewitt</i>	<i>Sobel</i>	Histogram		
					Citra Asli	Citra Hasil <i>Prewitt</i>	Citra Hasil <i>Sobel</i>
		Timing run	1.96608 detik	2.10489 detik			
		SNR (dB)	5.56059	5.11498			
40	Citra Aerial	Citra					
		Timing run	1.47319 detik	1.50995 detik			
		SNR (dB)	7.45959	6.6741			



**LAMPIRAN 3**  
**Perbandingan Hasil *Timing Run***

**Perbandingan Hasil *Timing Run***

No	Jenis Citra	Nama	Timing Run Segmentasi (detik)	
			<i>Prewitt</i>	<i>Sobel</i>
1	Medis	262068_chest_xray	0.620319	0.582092
2		10058749-black-and-white-medical-radiograph-of-thorax	0.658995	0.623976
3		a503b6b3be9c11e6924989f9f200cc93	0.633582	0.593858
4		13630964-collection-of-x-ray	0.592444	0.607379
5		C6-C7-disc-herniation-cevical-mri-scan	0.61125	0.595859
6		4365908-magnetic-resonance-image-mri-of-the-brain	0.580431	0.585016
7		MRI_T2_Brain_axial_image	0.60138	0.600458
8		panorama-x-ray-image-of-a-human-jaw-thumb22704476	0.632438	0.624201
9		sonogram-human-foetal-fetal-ultrasound-scan-at-22-weeks-mono-2-ANON	0.597542	0.581185
10		Usg	0.609999	0.577999
<b>Rata-Rata timing run Citra Medis</b>			<b>0.613838</b>	<b>0.597202</b>
11	Real	food-backgrounds-peras	0.563107	0.553452
12		manfaat-daun-sirih	0.639154	0.662095
13		35290e50d7ff3029aa524e8668eba056	0.710911	0.687596
14		5685316518_d9bc430c91_m	0.566897	0.624574
15		aW1hZ2VzL3Nma19waG90b3Mvc2ZrX3Bob3Rvc18xMjkyNDc0ODQwX3Fpb3dOUENMLmpwZw==	0.68422	0.700332
16		aW1hZ2VzL3Nma19waG90b3Mvc2ZrX3Bob3Rvc18xMjkyNzMwNTI4X0g2NzRGSDVtLmpwZw==	0.832128	0.752896
17		Tangan	0.763508	0.764996
18		rumahku1	0.774984	0.82895
19		forum-message-21058-Belalang-dan-alur-batang	0.826178	0.648307
20		tips-fotografi-makro	0.759656	0.781763
<b>Rata-Rata timing run Citra Real</b>			<b>0.7120743</b>	<b>0.700496</b>
21	Sintesis	23321-baby-feet-clip-art	0.581514	0.578462
22		24877-walking-man-blue-design	0.865565	0.771122
23		22408-flower4-clip-art	0.605107	0.594347

No	Jenis Citra	Nama	Timing Run Segmentasi (detik)	
			<i>Prewitt</i>	<i>Sobel</i>
24		18782-blue-monkey-designs-clip-art	0.742339	0.628775
25		13312-double-palm-beach-clip-art	0.595992	0.673206
26		13074-penguin-clip-art	0.701374	0.585506
27		13228-airplane-clip-art	0.536302	0.59767
28		11389-green-bird-house-clip-art	0.719085	0.589465
29		21694-baby-sitting-clip-art	0.597206	0.572278
30		942-cherries-fruit-clip-art	0.689252	0.591156
<b>Rata-Rata timing run Citra Sintesis</b>			<b>0.6633736</b>	<b>0.618199</b>
31	<b>Aeria I</b>	minggu-kiblat_peta-semenanjung	0.992157	0.852498
32		landsat-tm	1.36289	1.30685
33		Sampel	1.0515	1.19366
34		tr3z9eq9	0.784129	0.731616
35		surabaya_msi_june2_2004_dg	0.821942	1.03702
36		ALOS	1.3972	1.41668
37		aerial-photo-loughill-colimerick	0.764307	0.916153
38		670109main-yukon-delta-jpg_185732	0.868895	0.858626
39		2 Aerial 1	1.96608	2.10489
40		8269_10152132681086289_797889358_n	1.47319	1.50995
<b>Rata-Rata timing run Citra Aerial</b>			<b>1.148229</b>	<b>1.192794</b>



**LAMPIRAN 4**  
**Perbandingan Hasil SNR**

### Perbandingan Hasil SNR

No	Jenis Citra	Nama	SNR (dB)	
			<i>Prewitt</i>	<i>Sobel</i>
1	Medis	262068_chest_xray	9.27924	8.35389
2		10058749-black-and-white-medical-radiograph-of-thorax	9.04492	8.09154
3		a503b6b3be9c11e6924989f9f200cc93	7.44364	6.78345
4		13630964-collection-of-x-ray	9.03323	8.40554
5		C6-C7-disc-herniation-cevical-mri-scan	5.82329	5.36674
6		4365908-magnetic-resonance-image-mri-of-the-brain	5.86973	5.55933
7		MRI_T2_Brain_axial_image	6.21585	5.72178
8		panorama-x-ray-image-of-a-human-jaw-thumb22704476	5.54871	5.1168
9		sonogram-human-foetal-fetal-ultrasound-scan-at-22-weeks-mono-2-ANON	6.72441	6.39645
10		Usg	5.60257	5.34666
<b>Rata-rata nilai SNR citra medis</b>			<b>7.058559</b>	<b>6.514218</b>
11	Real	food-backgrounds-peras	7.5399	6.72355
12		manfaat-daun-sirih	8.60408	8.05712
13		35290e50d7ff3029aa524e8668eba056	8.93032	8.52275
14		5685316518_d9bc430c91_m	5.97874	5.68464
15		aW1hZ2VzL3Nma19waG90b3Mvc2ZrX3Bob3Rvc18xMjkyNDc0ODQwX3Fpb3dOUENMLmpwZw==	8.06313	7.55673
16		aW1hZ2VzL3Nma19waG90b3Mvc2ZrX3Bob3Rvc18xMjkyNzMwNTI4X0g2NzRGSDVtLmpwZw==	9.67519	8.70878
17		Tangan	7.71602	7.22955
18		rumahku1	8.34233	7.9569
19		forum-message-21058-Belalangan-dan-alur-batang	8.74357	8.2544
20		tips-fotografi-makro	8.63632	8.07522
<b>Rata-rata nilai SNR citra real</b>			<b>8.22296</b>	<b>7.676964</b>
21	Sintesis	23321-baby-feet-clip-art	6.1514	6.12768
22		24877-walking-man-blue-design	8.86576	9.9669
23		22408-flower4-clip-art	5.6566	5.56776
24		18782-blue-monkey-designs-clip-art	5.31205	5.24384
25		13312-double-palm-beach-clip-art	5.68834	5.63415

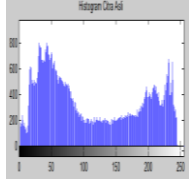
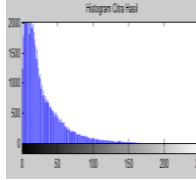
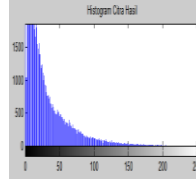
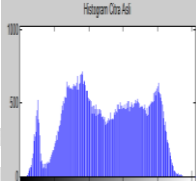
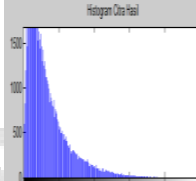
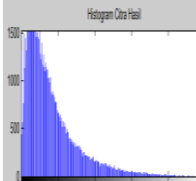
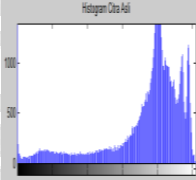
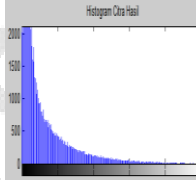
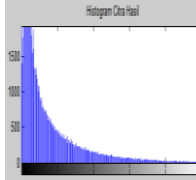
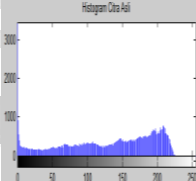
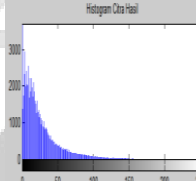
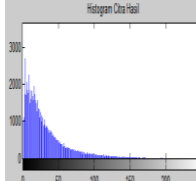
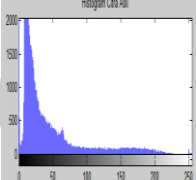
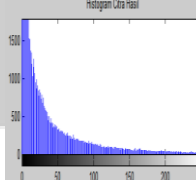
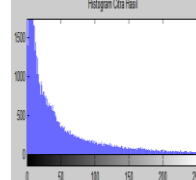
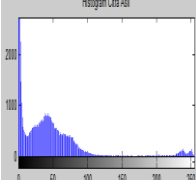
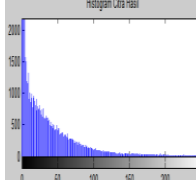
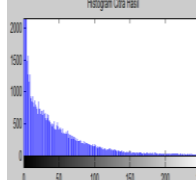


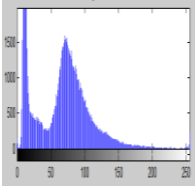
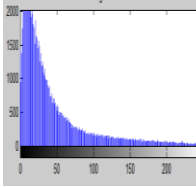
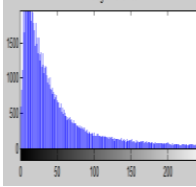
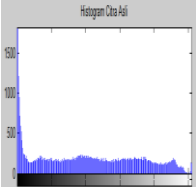
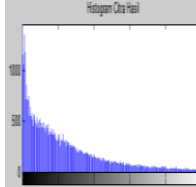
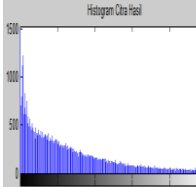
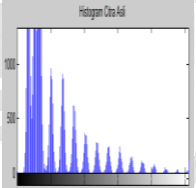
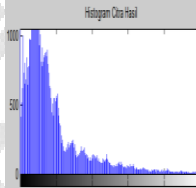
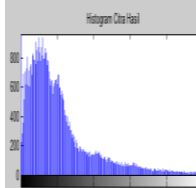
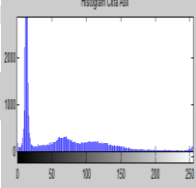
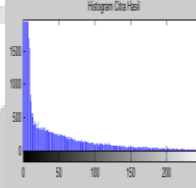
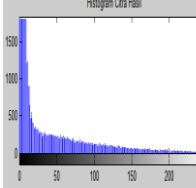
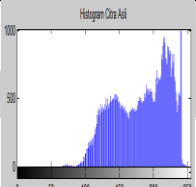
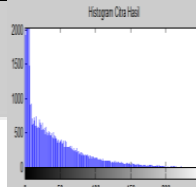
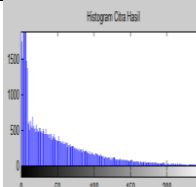
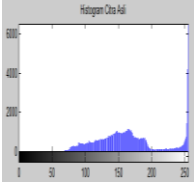
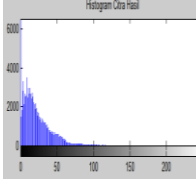
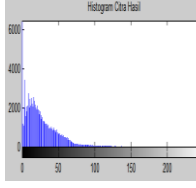
No	Jenis Citra	Nama	SNR (dB)	
			<i>Prewitt</i>	<i>Sobel</i>
26		13074-penguin-clip-art	5.79938	5.71396
27		13228-airplane-clip-art	4.40285	4.34742
28		11389-green-bird-house-clip-art	6.50115	6.40243
29		21694-baby-sitting-clip-art	5.06373	4.94906
30		942-cherries-fruit-clip-art	8.26623	7.74032
<b>Rata-rata nilai SNR citra Sintesis</b>			<b>6.170749</b>	<b>6.169352</b>
31	<b>Aerial</b>	minggu-kiblat_peta-semenanjung	7.54258	7.01093
32		landsat-tm	5.94276	5.4224
33		Sampel	5.35752	4.72777
34		tr3z9eq9	6.20975	5.67507
35		surabaya_msi_june2_2004_dg	6.1049	5.49382
36		ALOS	4.62275	4.18208
37		aerial-photo-loughill-colimerick	7.16968	6.81099
38		670109main-yukon-delta-jpg_185732	5.27567	4.73318
39		2 Aerial 1	5.56059	5.11498
40		8269_10152132681086289_797889358_n	7.45959	6.6741
<b>Rata-rata nilai SNR citra Aerial</b>			<b>6.124579</b>	<b>5.584532</b>

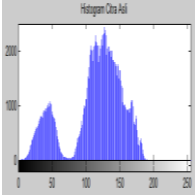
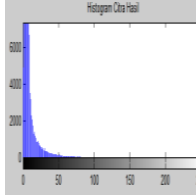
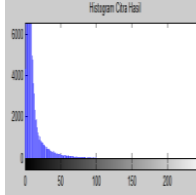
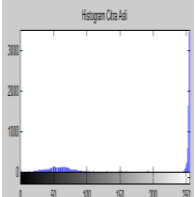
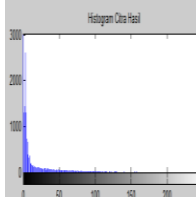
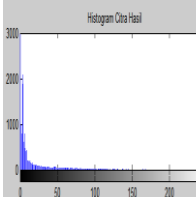
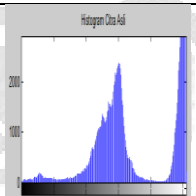
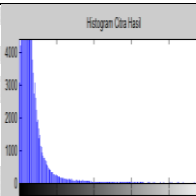
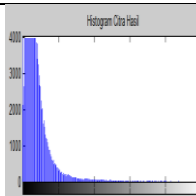
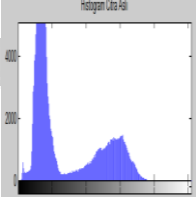
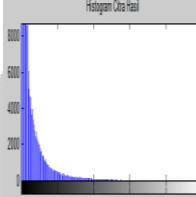
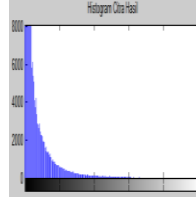
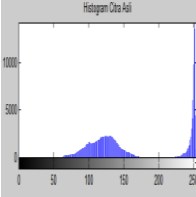
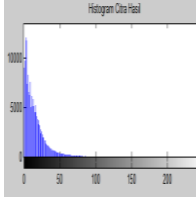
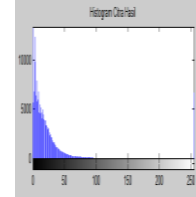


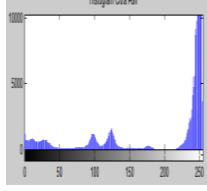
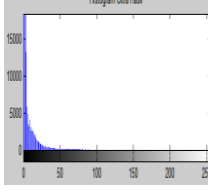
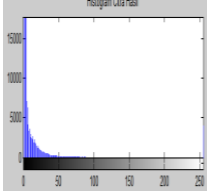
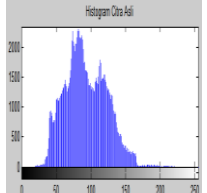
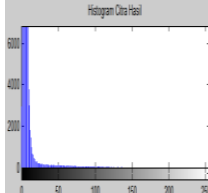
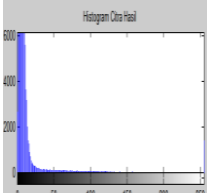
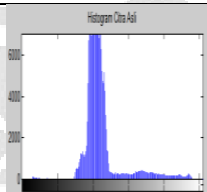
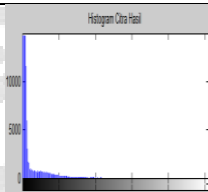
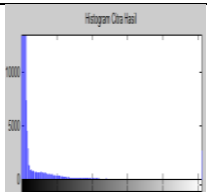
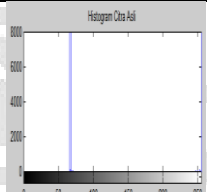
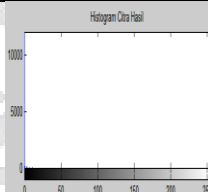
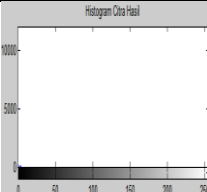
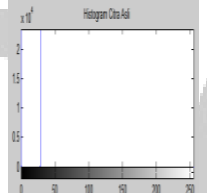
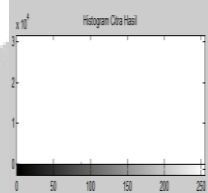
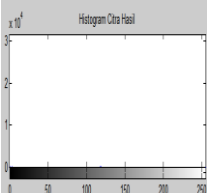
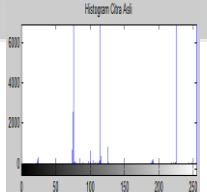
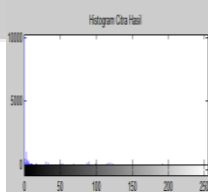
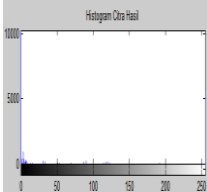
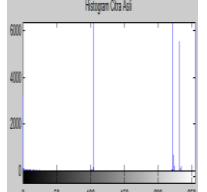
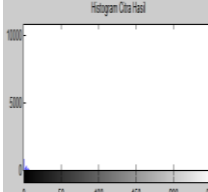
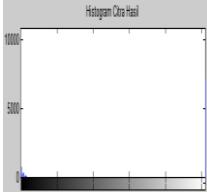
**LAMPIRAN 5**  
**Perbandingan Histogram Citra**

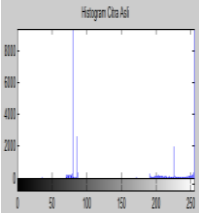
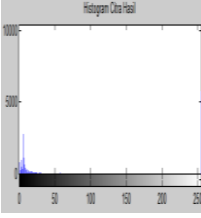
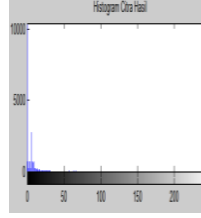
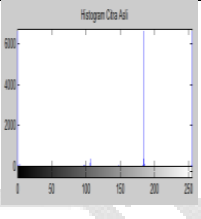
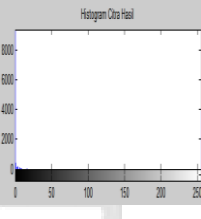
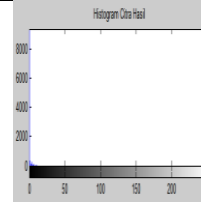
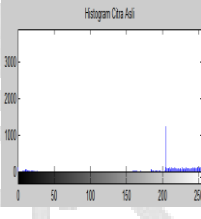
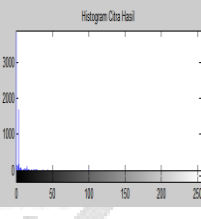
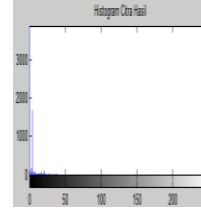
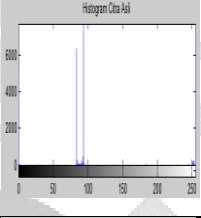
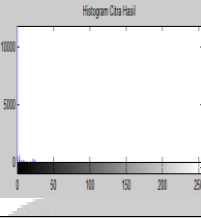
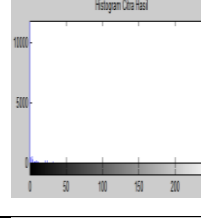
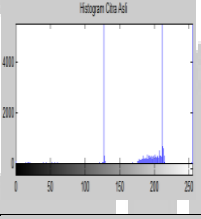
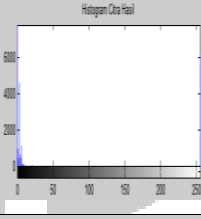
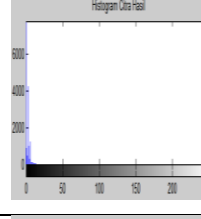
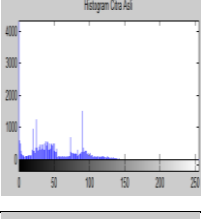
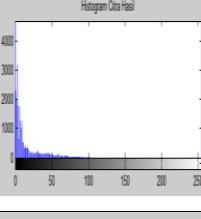
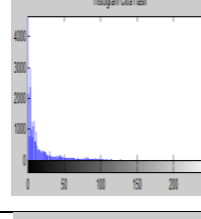
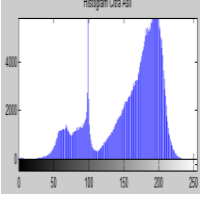
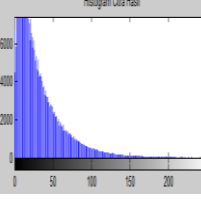
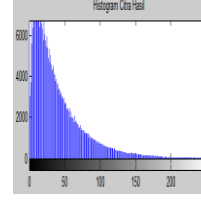
### Perbandingan Histogram Citra

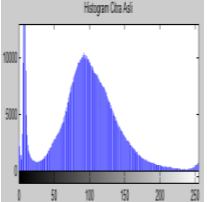
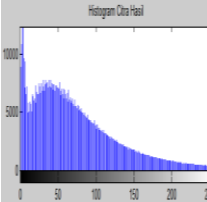
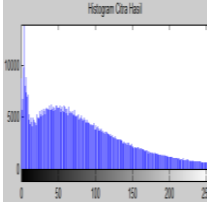
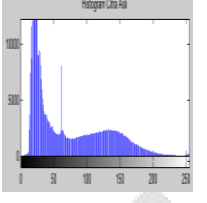
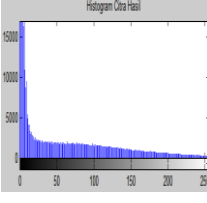
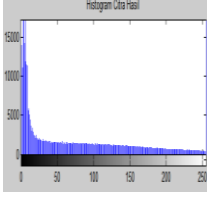
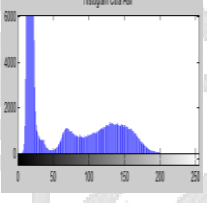
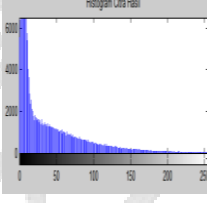
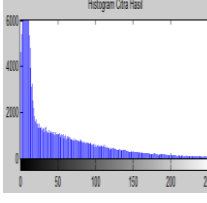
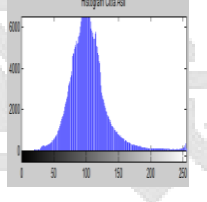
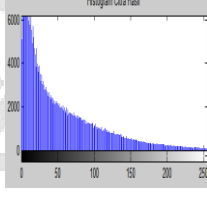
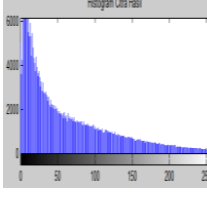
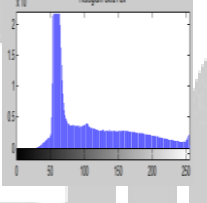
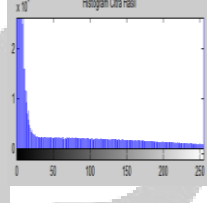
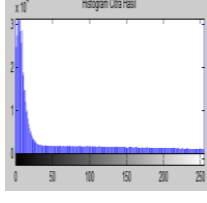
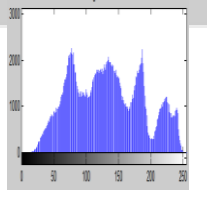
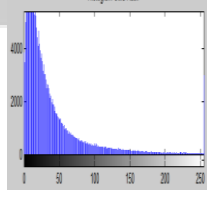
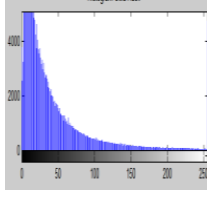
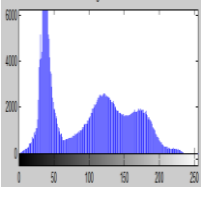
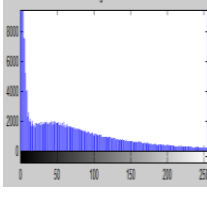
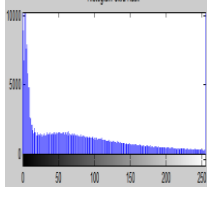
No	Jenis Citra	Nama Citra	Histogram Citra Asli	Histogram Citra Prewitt	Histogram Citra Sobel
1	Medis	262068_c hest_xray			
2		10058749- black-and- white- medical- radiograph- of-thorax			
3		a503b6b3 be9c11e69 24989f9f2 00cc93			
4		13630964- collection- of-x-ray			
5		C6-C7- disc- herniation- cevicl- mri-scan			
6		4365908- magnetic- resonance- image- mri-of- the-brain			

No	Jenis Citra	Nama Citra	Histogram Citra Asli	Histogram Citra <i>Prewitt</i>	Histogram Citra <i>Sobel</i>
7		MRI_T2_Brain_axial_image			
8		panorama-x-ray-image-of-a-human-jaw-thumb22704476			
9		sonogram-human-foetal-fetal-ultrasound-scan-at-22-weeks-mono-2-ANON			
10		Usg			
11		food-backgrounds-peras			
12	Real	manfaat-daun-sirih			

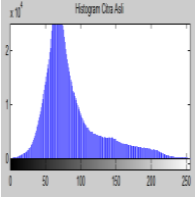
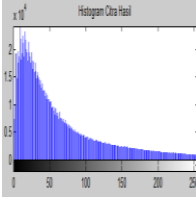
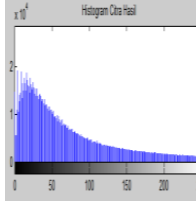
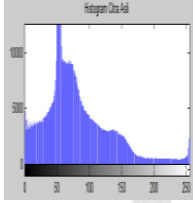
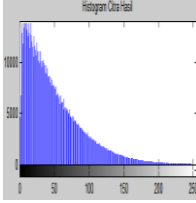
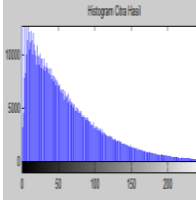
No	Jenis Citra	Nama Citra	Histogram Citra Asli	Histogram Citra Prewitt	Histogram Citra Sobel
13		35290e50 d7ff3029a a524e8668 eba056			
14		56853165 18_d9bc4 30c91_m			
15		aW1hZ2V zL3Nma1 9waG90b3 Mvc2ZrX 3Bob3Rvc 18xMjkyN Dc0ODQ wX3Fpb3 dOUENM LmpwZw ==			
16		aW1hZ2V zL3Nma1 9waG90b3 Mvc2ZrX 3Bob3Rvc 18xMjkyN zMwNTI4 X0g2NzR GSDVtLm pwZw==			
17		Tangan			

No	Jenis Citra	Nama Citra	Histogram Citra Asli	Histogram Citra Prewitt	Histogram Citra Sobel
18		rumahku1			
19		forum-message-21058-Belalangan-alur-batang			
20		tips-fotografi-makro			
21		23321-baby-feet-clip-art			
22		24877-walking-man-blue-design			
23	Sintesis	22408-flower4-clip-art			
24		18782-blue-monkey-designs-clip-art			

No	Jenis Citra	Nama Citra	Histogram Citra Asli	Histogram Citra Prewitt	Histogram Citra Sobel
25		13312-double-palm-beach-clip-art			
26		13074-penguin-clip-art			
27		13228-airplane-clip-art			
28		11389-green-bird-house-clip-art			
29		21694-baby-sitting-clip-art			
30		942-cherries-fruit-clip-art			
31	Aerial	minggu-kiblat_peta-semenanjung			

No	Jenis Citra	Nama Citra	Histogram Citra Asli	Histogram Citra Prewitt	Histogram Citra Sobel
32		landsat-tm			
33		Sampel			
34		tr3z9eq9			
35		surabaya_msi_june2_2004_dg			
36		ALOS			
37		aerial-photo-loughill-colimerick			
38		670109main-yukon-delta-jpg_185732			



No	Jenis Citra	Nama Citra	Histogram Citra Asli	Histogram Citra <i>Prewitt</i>	Histogram Citra <i>Sobel</i>
39		2 Aerial 1			
40		8269_101 52132681 086289_7 97889358 _n			





**LAMPIRAN 6**  
**Perbandingan Hasil Standar Deviasi**

### Perbandingan Hasil Standar Deviasi

No	Jenis Citra	Nama	Standar Deviasi	
			<i>Prewitt</i>	<i>Sobel</i>
1	Medis	262068_chest_xray	7.81598	8.01756
2		10058749-black-and-white-medical-radiograph-of-thorax	8.12058	8.30267
3		a503b6b3be9c11e6924989f9f200cc93	7.83815	8.03845
4		13630964-collection-of-x-ray	7.6354	7.94635
5		C6-C7-disc-herniation-cevical-mri-scan	8.07117	8.35753
6		4365908-magnetic-resonance-image-mri-of-the-brain	8.08678	8.30492
7		MRI_T2_Brain_axial_image	7.99244	8.22072
8		panorama-x-ray-image-of-a-human-jaw-thumb22704476	8.86979	9.10942
9		sonogram-human-foetal-fetal-ultrasound-scan-at-22-weeks-mono-2-ANON	7.89845	8.15229
10		Usg	8.21347	8.46477
<b>Rata-rata nilai SNR citra medis</b>			<b>8.054221</b>	<b>8.291468</b>
11	Real	food-backgrounds-peras	8.53848	8.703
12		manfaat-daun-sirih	7.31511	7.70363
13		35290e50d7ff3029aa524e8668eba056	4.92476	5.26523
14		5685316518_d9bc430c91_m	6.74497	6.9262
15		aW1hZ2VzL3Nma19waG90b3Mvc2ZrX3Bob3Rvc18xMjkyNDc0ODQwX3Fpb3dOUENMLmpwZw==	5.72851	5.99935
16		aW1hZ2VzL3Nma19waG90b3Mvc2ZrX3Bob3Rvc18xMjkyNzMwNTI4X0g2NzRGSDVtLmpwZw==	6.4587	6.73006
17		Tangan	5.89415	6.30879
18		rumahku1	5.10197	5.29908
19		forum-message-21058-Belalangan-dan-alur-batang	4.83241	4.87353
20		tips-fotografi-makro	5.60564	5.67241
<b>Rata-rata nilai SNR citra real</b>			<b>6.11447</b>	<b>6.348128</b>
21	Sintesis	23321-baby-feet-clip-art	4.80603	4.77728
22		24877-walking-man-blue-design	3.03505	2.98888
23		22408-flower4-clip-art	6.03495	6.0436
24		18782-blue-monkey-designs-clip-art	5.81089	5.80211
25		13312-double-palm-beach-clip-art	5.67122	5.68208

No	Jenis Citra	Nama	Standar Deviasi	
			<i>Prewitt</i>	<i>Sobel</i>
26		13074-penguin-clip-art	5.46508	5.43573
27		13228-airplane-clip-art	7.38663	7.40352
28		11389-green-bird-house-clip-art	4.5688	4.67433
29		21694-baby-sitting-clip-art	6.26477	6.2578
30		942-cherries-fruit-clip-art	6.39454	6.40819
<b>Rata-rata nilai SNR citra Sintesis</b>			<b>5.543796</b>	<b>5.547352</b>
31	<b>Aerial</b>	minggu-kiblat_peta-semenanjung	7.84615	8.17724
32		landsat-tm	9.30134	9.58978
33		Sampel	9.33581	9.51329
34		tr3z9eq9	8.32306	8.62026
35		surabaya_msi_june2_2004_dg	9.01645	9.21408
36		ALOS	9.44868	9.66248
37		aerial-photo-loughill-colimerick	7.69936	7.88883
38		670109main-yukon-delta-jpg_185732	9.30598	9.65459
39		2 Aerial 1	8.86332	9.18714
40		8269_10152132681086289_797889358_n	8.92255	9.06334
<b>Rata-rata nilai SNR citra Aerial</b>			<b>8.80627</b>	<b>9.057103</b>



**LAMPIRAN 7**  
**Tabel Distribusi Normal**

<b>z</b>	<b>0.00</b>	<b>0.01</b>	<b>0.02</b>	<b>0.03</b>	<b>0.04</b>	<b>0.05</b>	<b>0.06</b>
<b>0.0</b>	0.00000	0.00399	0.00798	0.01197	0.01595	0.01994	0.02392
<b>0.1</b>	0.03983	0.04380	0.04776	0.05172	0.05567	0.05962	0.06356
<b>0.2</b>	0.07926	0.08317	0.08706	0.09095	0.09483	0.09871	0.10257
<b>0.3</b>	0.11791	0.12172	0.12552	0.12930	0.13307	0.13683	0.14058
<b>0.4</b>	0.15542	0.15910	0.16276	0.16640	0.17003	0.17364	0.17724
<b>0.5</b>	0.19146	0.19497	0.19847	0.20194	0.20540	0.20884	0.21226
<b>0.6</b>	0.22575	0.22907	0.23237	0.23565	0.23891	0.24215	0.24537
<b>0.7</b>	0.25804	0.26115	0.26424	0.26730	0.27035	0.27337	0.27637
<b>0.8</b>	0.28814	0.29103	0.29389	0.29673	0.29955	0.30234	0.30511
<b>0.9</b>	0.31594	0.31859	0.32121	0.32381	0.32639	0.32894	0.33147
<b>1.0</b>	0.34134	0.34375	0.34614	0.34849	0.35083	0.35314	0.35543
<b>1.1</b>	0.36433	0.36650	0.36864	0.37076	0.37286	0.37493	0.37698
<b>1.2</b>	0.38493	0.38686	0.38877	0.39065	0.39251	0.39435	0.39617
<b>1.3</b>	0.40320	0.40490	0.40658	0.40824	0.40988	0.41149	0.41309
<b>1.4</b>	0.41924	0.42073	0.42220	0.42364	0.42507	0.42647	0.42785
<b>1.5</b>	0.43319	0.43448	0.43574	0.43699	0.43822	0.43943	0.44062
<b>1.6</b>	0.44520	0.44630	0.44738	0.44845	0.44950	0.45053	0.45154
<b>1.7</b>	0.45543	0.45637	0.45728	0.45818	0.45907	0.45994	0.46080
<b>1.8</b>	0.46407	0.46485	0.46562	0.46638	0.46712	0.46784	0.46856
<b>1.9</b>	0.47128	0.47193	0.47257	0.47320	0.47381	0.47441	0.47500
<b>2.0</b>	0.47725	0.47778	0.47831	0.47882	0.47932	0.47982	0.48030
<b>2.1</b>	0.48214	0.48257	0.48300	0.48341	0.48382	0.48422	0.48461
<b>2.2</b>	0.48610	0.48645	0.48679	0.48713	0.48745	0.48778	0.48809
<b>2.3</b>	0.48928	0.48956	0.48983	0.49010	0.49036	0.49061	0.49086
<b>2.4</b>	0.49180	0.49202	0.49224	0.49245	0.49266	0.49286	0.49305
<b>2.5</b>	0.49379	0.49396	0.49413	0.49430	0.49446	0.49461	0.49477
<b>2.6</b>	0.49534	0.49547	0.49560	0.49573	0.49585	0.49598	0.49609
<b>2.7</b>	0.49653	0.49664	0.49674	0.49683	0.49693	0.49702	0.49711
<b>2.8</b>	0.49744	0.49752	0.49760	0.49767	0.49774	0.49781	0.49788
<b>2.9</b>	0.49813	0.49819	0.49825	0.49831	0.49836	0.49841	0.49846
<b>3.0</b>	0.49865	0.49869	0.49874	0.49878	0.49882	0.49886	0.49889
<b>3.1</b>	0.49903	0.49906	0.49910	0.49913	0.49916	0.49918	0.49921
<b>3.2</b>	0.49931	0.49934	0.49936	0.49938	0.49940	0.49942	0.49944
<b>3.3</b>	0.49952	0.49953	0.49955	0.49957	0.49958	0.49960	0.49961
<b>3.4</b>	0.49966	0.49968	0.49969	0.49970	0.49971	0.49972	0.49973
<b>3.5</b>	0.49977	0.49978	0.49978	0.49979	0.49980	0.49981	0.49981
<b>3.6</b>	0.49984	0.49985	0.49985	0.49986	0.49986	0.49987	0.49987
<b>3.7</b>	0.49989	0.49990	0.49990	0.49990	0.49991	0.49991	0.49992

## CURRICULUM VITAE

### Identitas Diri

Nama : Muhamad Ramadhan  
Tempat/Tanggal Lahir : Pasuruan, 02 April 1992  
Kewarganegaraan : Indonesia  
Agama : Islam  
Jenis Kelamin : Laki-laki  
Status Perkawinan : Belum Kawin  
Tinggi/ Berat Badan : 178 cm/ 70 kg  
Golongan Darah : 0  
Alamat : Mandungan, Srimartani, Piyungan 55792, Bantul,  
Yogyakarta  
Hobi : Olahraga  
Email : [speedy.ramadhan@gmail.com](mailto:speedy.ramadhan@gmail.com)  
Handphone : 085325876828  
Nama Ayah : Agung Budianto,A.md  
Nama Ibu : Like Widiastuti S.Pd

### Riwayat Pendidikan

- TK PKK 70 Piyungan (1997-1998)
- SD Negeri Piyungan (1998-2004)
- SMP Negeri 1 Piyungan (2004-2007)
- SMA Negeri 1 Kalasan (2007-2010)
- UIN Sunan Kalijaga (2010-2014/2015)