

APPENDIX

CODING LOAD SAMPEL GAMBAR

```
def load_image_from_folder(folder):
    images = []
    for datattd in os.listdir(folder):
        img = os.path.join(folder, datattd)
```

CODING PENCATATAN NILAI ENTROPY DAN WAKTU PROSES

```
if img is not None:
    t1 = time.time()
    print("entropy = "+str(entropy(openImage(img))) )
    t2 = time.time()
    print("Waktu yang dibutuhkan untuk menghitung entropy
          adalah %.2f detik\n\n" %(t2-t1))
```

MENGOLAH DATA GAMBAR MENJADI BINARY IMAGE

```
def openImage(datattd):

    print("Sampel TTD = "+datattd)
    width, height = img.size

    imgs = img.load()

    pixel = []
    for y in range(height):
        for x in range(width):
            R, G, B = imgs[x, y]
            gray = (0.2989 * R) + (0.5870 * G) + (0.1140 * B)
            if gray >= 110:
                pixel.append(255)
            else:
                pixel.append(0)
    return pixel
```

MENGHITUNG LOGARTIMA BASIS 2

```
def ln(x):
    n = 1000.0
    return n * ((x ** (1/n)) - 1)

def HitungLog(x):
    return ln(x)/ln(2)
```

MENGHITUNG NILAI ENTROPY

```
def entropy(pixel):
    count = []

    for i in range(256):
        count.append(0)

    for i in range(len(pixel)):
        count[pixel[i]]+=1

    temp=[]
    for i in range(256):
        print(count[i])
        if(count[i]>0):
            temp.append(count[i] / len(pixel))

    total_entropy = 0

    for i in range(len(temp)):
        temp[i] = ((-temp[i]) * (HitungLog(temp[i])))
        total_entropy += temp[i]

    return total_entropy
```





2.11% PLAGIARISM
APPROXIMATELY

Report #12287535

CHAPTER 1 Introduction 1.1 Background Signature is an identity that must be owned by everyone. Signature is often used to legalize a document. The authenticity of the signature is very important for this matter. Some people deliberately forge signatures with bad intentions. Falsification of signatures often occurs in existing institutions, such as schools, banks, offices, and others. So, this research will use signature image processing techniques based on the value of entropy to find out the authenticity of the signatures. Entropy value is used to measure the uncertainty of the random variable. At the end of the calculation, the results will be shown together (Entropy values, and time process). This project is using signatures of 15 respondents as training data, and 15 respondents as test data. All of the test data samples are using a ballpoint size 0.1, 0.3, 0.4, 0.5, 0.8 and the color is black, while the training data using size 0.5. Respondents will sign their signatures 10 times (each size 2 signatures), and some new respondents will imitate the existing sample signatures. From the final entropy results, the entropy data training will be compared with the entropy data test. If the results are close, then its declared as the original signature. Then we will also check how the entropy results of the fake signature entropy. 1.2 Problem Formulation How is the difference between the original