

## DAFTAR ISI

|   |      |
|---|------|
| SKRIPSI.....                                  | ii   |
| HALAMAN PENGESAHAN.....                       | iii  |
| HALAMAN PERNYATAAN .....                      | iv   |
| HALAMAN MOTTO .....                           | v    |
| HALAMAN PRAKATA .....                         | vi   |
| DAFTAR ISI.....                               | vii  |
| DAFTAR GAMBAR .....                           | x    |
| DAFTAR TABEL.....                             | xii  |
| INTISARI.....                                 | xiii |
| ABSTRACT.....                                 | xiv  |
| BAB 1    PENDAHULUAN .....                    | 1    |
| 1.1    Latar Belakang.....                    | 1    |
| 1.2    Rumusan Masalah .....                  | 3    |
| 1.3    Batasan Masalah.....                   | 4    |
| 1.4    Tujuan Penelitian.....                 | 4    |
| 1.5    Manfaat Penelitian.....                | 4    |
| 1.6    Tahapan Penelitian.....                | 4    |
| 1.7    Sistematika Penulisan.....             | 5    |
| BAB 2    TINJAUAN PUSTAKA .....               | 7    |
| BAB 3    LADASAN TEORI.....                   | 11   |
| 3.1    Jaringan Syaraf Tiruan.....            | 11   |
| 3.1.1    Fungsi aktivasi .....                | 12   |
| 3.1.2    Fungsi <i>Loss</i> .....             | 13   |
| 3.1.3    Algoritma optimasi.....              | 14   |
| 3.2 <i>Convolutional Neural Network</i> ..... | 15   |
| 3.2.1 <i>Convolutional layer</i> .....        | 15   |
| 3.2.2 <i>Pooling layer</i> .....              | 17   |
| 3.2.3 <i>Batch Normalization</i> .....        | 18   |
| 3.2.4 <i>Fully Connected layer</i> .....      | 18   |

|       |   |    |
|-------|---|----|
| 3.2.5 | <i>Transfer learning</i> .....                            | 19 |
| 3.3   | Augmentasi data .....                                     | 19 |
| 3.4   | <i>Generative Adversarial Network</i> .....               | 20 |
| 3.4.1 | <i>Deep Convolutional GAN</i> .....                       | 22 |
| 3.4.2 | <i>Kullback–Leibler Divergence</i> .....                  | 23 |
| BAB 4 | ANALISIS DAN RANCANGAN .....                              | 24 |
| 4.1   | Deskripsi Penelitian.....                                 | 24 |
| 4.2   | Rancangan Data.....                                       | 26 |
| 4.3   | Rancangan Model DCGAN.....                                | 28 |
| 4.3.1 | Rancangan <i>Generator</i> .....                          | 28 |
| 4.3.2 | Rancangan <i>Discriminator</i> .....                      | 31 |
| 4.4   | Rancangan Model Klasifikasi.....                          | 36 |
| 4.5   | Rancangan Evaluasi.....                                   | 40 |
| BAB 5 | IMPLEMENTASI .....  | 43 |
| 5.1   | Alat dan Bahan .....                                      | 43 |
| 5.2   | Implementasi Pengolahan Data .....                        | 44 |
| 5.2.1 | Pengolahan Data pada Model DCGAN .....                    | 45 |
| 5.2.2 | Pengolahan Data pada Model Klasifikasi .....              | 47 |
| 5.3   | Implementasi Model DCGAN.....                             | 51 |
| 5.3.1 | Konfigurasi <i>Layer</i> Model <i>Generator</i> .....     | 51 |
| 5.3.2 | Konfigurasi <i>Layer</i> Model <i>Discriminator</i> ..... | 54 |
| 5.3.3 | Optimasi Parameter.....                                   | 56 |
| 5.3.4 | Fungsi <i>Loss</i> .....                                  | 56 |
| 5.3.5 | Proses Pelatihan Model .....                              | 57 |
| 5.4   | Implementasi Model Klasifikasi.....                       | 60 |
| 5.4.1 | <i>Transfer Learning</i> .....                            | 60 |
| 5.4.2 | Konfigurasi <i>Layer</i> .....                            | 61 |
| 5.4.3 | Optimasi dan <i>Loss</i> .....                            | 63 |
| 5.4.4 | Proses Pelatihan Model .....                              | 64 |
| 5.5   | Implementasi Pengujian .....                              | 65 |
| 5.5.1 | Data Sintetis DCGAN .....                                 | 65 |
| 5.5.2 | Skenario Dataset Pengujian.....                           | 67 |

|                |   |    |
|----------------|---|----|
| 5.5.3          | Metrik Performa Model Klasifikasi ..... | 69 |
| 5.5.4          | Pengujian Model Klasifikasi .....       | 70 |
| BAB 6          | HASIL DAN PEMBAHASAN.....               | 71 |
| 6.1            | Hasil Model DCGAN .....                 | 71 |
| 6.1.1          | Performa Pelatihan Model.....           | 71 |
| 6.1.2          | Pembangkitan Citra Sintetis .....       | 75 |
| 6.2            | Hasil Pengujian Klasifikasi .....       | 77 |
| 6.2.1          | Performa Pelatihan Model.....           | 77 |
| 6.2.2          | Pengujian Model .....                   | 80 |
| BAB 7          | KESIMPULAN DAN SARAN .....              | 81 |
| 7.1            | Kesimpulan.....                         | 81 |
| 7.2            | Saran .....                             | 81 |
| DAFTAR PUSTAKA | .....                                   | 82 |