

DAFTAR ISI

Hlm.

| | |
|--|------------|
| HALAMAN JUDUL | |
| LEMBAR PERSETUJUAN | |
| LEMBAR PENGESAHAN | |
| LEMBAR PERNYATAAN KARYA SENDIRI | |
| ABSTRAK..... | i |
| ABSTRACT..... | ii |
| KATA PENGANTAR | iii |
| DAFTAR ISI..... | iv |
| DAFTAR GAMBAR | vii |
| DAFTAR TABEL..... | x |
| BAB I PENDAHULUAN | 1 |
| 1.1 Latar Belakang..... | 1 |
| 1.2 Perumusan Masalah..... | 4 |
| 1.3 Tujuan Penelitian..... | 4 |
| 1.4 Batasan Masalah..... | 4 |
| 1.5 Manfaat Penelitian..... | 5 |
| 1.6 Kerangka Pemikiran..... | 6 |
| 1.7 Metodologi Penelitian..... | 7 |
| 1.7.1 Pengumpulan Data..... | 7 |
| 1.7.2 Tahapan Penelitian..... | 8 |
| 1.8 Sistematika Penulisan..... | 9 |
| BAB II TINJAUAN PUSTAKA..... | 11 |
| 2.1 Tinjauan Pustaka..... | 11 |
| 2.2 <i>Deep Learning</i> | 14 |
| 2.3 <i>Convolutional Neural Networks</i> | 15 |
| 2.4 Emosi..... | 19 |
| 2.5 Musik..... | 20 |
| 2.6 Pemrosesan Data Audio..... | 21 |
| 2.7 Gelombang Suara..... | 22 |
| 2.8 Frekuensi & Amplitudo..... | 22 |

| | |
|--|-----------|
| 2.9 Analog Digital Conversion (ADC) | 24 |
| 2.10 Short-Time Fourier Transform (STFT) & Fast Fourier Transform (FFT) | 24 |
| 2.11 Mel Frequency Cepstral Coefficients (MFCCs)..... | 26 |
| 2.12 Python | 27 |
| 2.13 Tensorflow | 28 |
| 2.14 Keras | 29 |
| 2.15 Confusion Matrix | 30 |
| BAB III METODOLOGI PENELITIAN..... | 33 |
| 3.1 Analisis Kebutuhan..... | 33 |
| 3.1.1 Studi Literatur | 33 |
| 3.1.2 Analisis Masalah | 33 |
| 3.1.3 Analisis Kebutuhan Fungsional | 34 |
| 3.1.4 Analisis Kebutuhan Non-fungsional..... | 35 |
| 3.2 Desain Sistem | 35 |
| 3.2.1 Arsitektur Sistem..... | 36 |
| 3.2.2 Desain Model | 37 |
| 3.2.2.1 Data Extraction | 37 |
| 3.2.2.2 Modelling Deteksi Genre Musik | 40 |
| 3.2.2.3 Modelling Deteksi Emosi | 42 |
| 3.2.3 Use Case Diagram | 43 |
| 3.2.4 Activity Diagram | 45 |
| 3.2.4.1 Activity Diagram Upload File Musik..... | 45 |
| 3.2.4.2 Activity Diagram Rekam Musik..... | 46 |
| 3.2.4.3 Activity Diagram Deteksi Emosi..... | 47 |
| 3.2.4.4 Activity Diagram Ekstraksi Data | 48 |
| 3.2.4.5 Activity Diagram Menjalankan Model | 49 |
| 3.2.4.6 Activity Diagram Mengambil Data Rekomendasi Musik | 49 |
| 3.2.5 Class Diagram | 50 |
| 3.2.6 Sequence Diagram | 51 |
| 3.2.6.1 Sequence Diagram Upload File Musik..... | 51 |
| 3.2.6.2 Sequence Diagram Rekam Musik..... | 52 |

| | |
|--|-----------|
| 3.2.6.3 <i>Sequence Diagram</i> Deteksi Emosi | 52 |
| 3.2.6.4 <i>Sequence Diagram</i> Ekstraksi Data | 53 |
| 3.2.6.5 <i>Sequence Diagram</i> Menjalankan Model | 53 |
| 3.2.6.6 <i>Sequence Diagram</i> Mengambil Data Rekomendasi Musik | 54 |
| 3.3 Data Karakteristik Musik pada Spotify API | 54 |
| 3.4 Jadwal Iterasi Agile | 56 |
| BAB IV HASIL DAN PEMBAHASAN | 58 |
| 4.1 Implementasi Sistem | 58 |
| 4.1.1 Implementasi Perangkat Lunak | 58 |
| 4.1.2 Implementasi Perangkat Keras | 59 |
| 4.1.3 Implementasi Algoritma | 59 |
| 4.1.3.1 <i>Data Extraction</i> Deteksi Genre Musik | 59 |
| 4.1.3.2 <i>Modelling</i> Deteksi Genre Musik | 61 |
| 4.1.3.3 <i>Data Extraction</i> Deteksi Emosi | 64 |
| 4.1.3.4 <i>Modelling</i> Deteksi Emosi | 66 |
| 4.1.4 Implementasi Model Pada Aplikasi | 67 |
| 4.2 Pengujian Sistem | 72 |
| 4.2.1 Pengujian <i>Black Box</i> | 72 |
| 4.2.2 Pengujian & Evaluasi Model | 75 |
| 4.2.2.1 Evaluasi Model Deteksi Genre Musik | 75 |
| 4.2.2.2 Evaluasi Model Deteksi Emosi | 84 |
| BAB V SIMPULAN DAN SARAN | 87 |
| 5.1 Kesimpulan | 87 |
| 5.2 Saran | 88 |
| DAFTAR PUSTAKA | 90 |
| LAMPIRAN | 96 |