

## DAFTAR ISI

HALAMAN JUDUL .....	i
HALAMAN PENGESAHAN I.....	ii
HALAMAN PENGESAHAN .....	iii
KATA PENGANTAR.....	iv
ABSTRAK .....	v
<i>ABSTRACT</i> .....	<i>vi</i>
BAB I PENDAHULUAN .....	1
1.1 Latar Belakang .....	1
1.2 Rumusan Masalah .....	6
1.3 Batasan Masalah.....	7
1.4 Tujuan Penelitian.....	7
BAB II TINJAUAN PUSTAKA .....	9
2.1 Pneumonia.....	9
2.2 Citra.....	9
2.3 <i>Data Preprocessing</i> .....	11
2.3.1 <i>Resize Image</i> .....	11
2.3.2 <i>Min-Max Normalization</i> .....	12
2.3.3 <i>Batch Normalization</i> .....	12
2.4 Augmentasi Data .....	13
2.4.1 <i>Flip Vertikal Horizontal</i> .....	14
2.4.2 <i>Random Rotation</i> .....	14
2.4.3 <i>Random Contrast</i> .....	14
2.4.4 <i>Random Brightness</i> .....	15
2.5 <i>Artificial Neural Network</i> .....	15
2.5.1 Fungsi Aktivasi.....	16
2.5.2 <i>Binary Cross Entropy Loss</i> .....	19
2.5.3 <i>Backpropagation</i> .....	19
2.5.4 <i>ADAM Optimizer</i> .....	21
2.6 <i>Convolutional Neural Network</i> .....	21

2.6.1	Lapisan Konvolusi.....	22
2.6.2	<i>Padding</i> .....	23
2.6.3	<i>Stride</i> .....	23
2.6.4	<i>Flatten</i> .....	23
2.7	<i>Depthwise Separable Convolution</i> .....	24
2.8	MobileNet.....	25
2.9	<i>Transfer Learning</i> .....	25
2.10	<i>Confusion Matrix</i> .....	25
BAB III METODE PENELITIAN .....		28
3.1	Jenis dan Sumber Data .....	28
3.2	Variabel Penelitian .....	28
3.3	Tahapan Analisis Data .....	29
3.4	Diagram Alir Analisis Data.....	31
BAB IV HASIL DAN PEMBAHASAN.....		33
4.1	Statistika Deskriptif.....	33
4.2	<i>Preprocessing</i> .....	34
4.2.1	<i>Input Data</i> .....	34
4.2.2	Normalisasi Data .....	36
4.3	Augmentasi Gambar.....	37
4.3.1	<i>Random Flip</i> Vertikal and Horizontal .....	37
4.3.2	<i>Random Rotation</i> .....	37
4.3.3	<i>Random Contrast</i> .....	38
4.3.4	<i>Random Brightness</i> .....	38
4.4	Pelatihan <i>Depthwise Separable Convolution</i> .....	39
4.5	Model Terbaik <i>Depthwise Separable Convolution</i> .....	40
4.6	Pelatihan Model <i>Transfer Learning</i> MobileNet.....	48
4.7	Model Terbaik <i>Transfer Learning</i> MobileNet .....	48
4.8	Penentuan Model Terbaik .....	51
4.9	Tahap Klasifikasi Model .....	52
4.10	Evaluasi Model Terbaik .....	66
BAB V PENUTUP .....		68
5.1	Kesimpulan.....	68

5.2	Saran.....	69
	DAFTAR PUSTAKA.....	70
	LAMPIRAN .....	75