

DAFTAR ISI

	Hlm.
LEMBAR PERSETUJUAN.....	ii
LEMBAR PENGESAHAN	iii
LEMBAR PERNYATAAN KARYA.....	iv
LEMBAR PERSEMBAHAN	v
ABSTRAK	vi
<i>ABSTRACT</i>	vii
KATA PENGANTAR	viii
DAFTAR ISI.....	x
DAFTAR GAMBAR	xiv
DAFTAR TABEL.....	xv
DAFTAR LAMPIRAN.....	xvi
BAB I PENDAHULUAN.....	1
1.1 Latar Belakang	1
1.2 Perumusan Masalah.....	3
1.3 Tujuan Penelitian.....	3
1.4 Batasan Masalah Penelitian.....	3
1.5 Manfaat Penelitian.....	4
1.6 Kerangka Pemikiran Penelitian.....	5
1.7 Sistematika Penulisan.....	6
BAB II KAJIAN LITERATUR	7
2.1 <i>State of the Art</i>	7
2.2 Landasan Teori	10
2.2.1 Pengolahan Citra	10
2.2.2 <i>Artificial Intelligence</i> dan <i>Machine Learning</i>	11
2.2.3 <i>Deep Learning</i>	11
2.2.4 <i>Convolutional Neural Network</i> (CNN)	12
2.2.4.1 <i>Convolution Layer</i>	13
2.2.4.2 <i>Pooling Layer</i>	14
2.2.4.3 <i>Fully Connected Layer</i>	14
2.2.4.4 <i>Rectified Linear Unit</i> (ReLU)	15
2.2.5 <i>Support Vector Machine</i> (SVM).....	15
2.2.5.1 <i>Support Vector Classifier</i> (SVC)	16

2.2.5.2 Kernel Linear	17
2.2.6 Feature Scaling	17
2.2.7 Confusion Metrix.....	18
2.2.7.1 Akurasi	19
2.2.7.2 Presisi	19
2.2.7.3 Recall.....	19
2.2.7.4 F1 Score	19
2.2.8 CRISP-DM.....	20
2.2.8.1 Bussiness Understanding	21
2.2.8.2 Data Understanding.....	21
2.2.8.3 Data preparation.....	22
2.2.8.4 Modelling	22
2.2.8.5 Evaluation	22
2.2.8.6 Deployment	22
BAB III METODOLOGI PENELITIAN.....	23
3.1 Business Understanding	24
3.1.1 Determine Business.....	24
3.1.2 Asses Situation	24
3.1.3 Determine Data Minig Goals.....	24
3.1.4 Plan Active	25
3.2 Data Understanding	25
3.2.1 Collect Initial Data	26
3.2.2 Describe Data	26
3.2.3 Explore Data	26
3.3 Data Preparation	26
3.3.1 Data Selection	26
3.3.2 Data Preprocessing.....	26
3.4 Modelling.....	27
3.4.1 Select Modelling Technique	27
3.4.2 Build Model.....	28
3.4.3 Generate Test Design.....	29
3.5 Evaluation / Evaluasi.....	30
3.5.1 Evaluate Result.....	30
3.5.2 Determine Next Step.....	30
3.6 Deployment / Pemasangan.....	31
3.6.1 Deployment Plan	31

3.6.2 Produce Final Report.....	31
BAB IV HASIL DAN PEMBAHASAN	32
4.1 Hasil.....	32
4.1.1 Business Understanding.....	32
4.1.1.1 Determine Business	32
4.1.1.2 Asses Situation	32
4.1.1.3 Determine Data Mining Goals.....	33
4.1.1.4 Plan Active	33
4.1.2 Data Understanding.....	33
4.1.2.1 Collect Initial Data	33
4.1.2.2 Describe Data	34
4.1.2.3 Explore Data	34
4.1.3 Data Preparation	35
4.1.3.1 Data Selection	35
4.1.3.2 Data Preprocessing.....	35
4.1.4 Modelling	36
4.1.4.1 Select Modelling Technique	36
4.1.4.2 Build Model.....	36
4.1.4.3 Generate Test Design.....	41
4.1.4.2 Skenario Penelitian 1 Model CNN <i>end-to-end</i>	41
4.1.4.3 Skenario Penelitian 2 Model CNN <i>end-to-end</i>	42
4.1.4.4 Skenario Penelitian 3 Model CNN <i>end-to-end</i>	44
4.1.4.5 Skenario Penelitian 4 Model CNN <i>end-to-end</i>	45
4.1.4.6 Skenario Penelitian 1 Model Hybrid CNN dan SVC.....	47
4.1.4.7 Skenario Penelitian 2 Model Hybrid CNN dan SVC.....	48
4.1.4.8 Skenario Penelitian 3 Model Hybrid CNN dan SVC.....	49
4.1.4.9 Skenario Penelitian 4 Model Hybrid CNN dan SVC.....	51
4.1.5 Evaluation	52
4.1.5.1 Evaluate Result.....	54
4.1.5.2 Determine Next Step.....	55
4.1.6 Deployment	56
4.1.6.1 Deployment Plan.....	56
4.1.6.2 Peoduce Final	56
4.2 Pembahasan	57
4.2.1 Pembahasan Rumusan Masalah 1	57
4.2.2 Pembahasan Rumusan Masalah 2	57

BAB V SIMPULAN DAN SARAN.....	59
5.1 Simpulan.....	59
5.2 Saran.....	60
DAFTAR PUSTAKA	61
LAMPIRAN.....	65



DAFTAR GAMBAR

	Hlm.
Gambar 1.1 Kerangka Pemikiran Penelitian	5
Gambar 2.1 Alur Kerja CNN	12
Gambar 2.2 <i>Convolution Layer</i>	13
Gambar 2.3 <i>Max Pooling Layer</i>	14
Gambar 2.4 <i>Fully Connected Layer</i>	14
Gambar 2.5 Konsep Dasar SVM	15
Gambar 4.1 Dataset kanker kulit melanoma dari Roboflow	34
Gambar 4.2 Gambar dataset format jpg.....	34
Gambar 4.3 Dataset split	35
Gambar 4.4 Hasil Augmentasi Data	36
Gambar 4.5 Model <i>hybrid</i> CNN dan SVC	39
Gambar 4.6 <i>Heatmap confusion matrix</i> skenario 1 model CNN murni	42
Gambar 4.7 <i>Heatmap confusion matrix</i> skenario 2 model CNN murni	43
Gambar 4.8 <i>Heatmap confusion matrix</i> skenario 3 model CNN murni	44
Gambar 4.9 <i>Heatmap confusion matrix</i> skenario 4 model CNN murni	46
Gambar 4.10 <i>Heatmap Confusion Matrix</i> Skenario 1 model <i>hybrid</i>	47
Gambar 4.11 <i>Heatmap Confusion Matrix</i> Skenario 2 model <i>hybrid</i>	48
Gambar 4.12 <i>Heatmap Confusion Matrix</i> Skenario 3 model <i>hybrid</i>	50
Gambar 4.13 <i>Heatmap Confusion Matrix</i> Skenario 4 model <i>hybrid</i>	51
Gambar 4.14 <i>Deployment</i> ke Gradio	56

DAFTAR TABEL

	Hlm.
Tabel 2.1 <i>State of the Art</i>	7
Tabel 2.2 <i>Confusion Matrix</i>	20
Tabel 3.1 Informasi dataset dari situs robolow	25
Tabel 3.2 Skenario penelitian CNN murni	28
Tabel 3.3 Skenario Penelitian model <i>hybrid</i> CNN dan SVC	29
Tabel 3.4 Contoh hasil <i>Confusion Matrix</i>	29
Tabel 4.1 Hyperparameter dari model CNN murni	37
Tabel 4.2 <i>Hyperparameter</i> model <i>hybrid</i> CNN dan SVC	39
Tabel 4.3 Hasil <i>confusion matrix</i> skenario 1 model CNN murni	42
Tabel 4.4 Hasil <i>confusion matrix</i> skenario 2 CNN murni	44
Tabel 4.5 Hasil <i>confusion matrix</i> skenario 3 CNN murni	45
Tabel 4.6 Hasil <i>confusion matrix</i> skenario 4 CNN murni	46
Tabel 4.7 Hasil <i>confusion matrix</i> skenario 1 model <i>hybrid</i>	48
Tabel 4.8 Hasil <i>confusion matrix</i> skenario 2 model <i>hybrid</i>	49
Tabel 4.9 Hasil <i>confusion matrix</i> skenario 3 model <i>hybrid</i>	50
Tabel 4.10 Hasil <i>confusion matrix</i> skenario 1 model <i>hybrid</i>	52
Tabel 4.11 Perbandingan Hasil tiap skenario pada model CNN murni	52
Tabel 4.12 Perbandingan hasil tiap skenario model <i>Hybrid</i>	53

DAFTAR LAMPIRAN

Lampiran 1 Source Code.....	65
-----------------------------	----

