

DAFTAR GAMBAR

Gambar 1.1 Cacat PCB Open Circuit	6
Gambar 1.2 Cacat PCB <i>Short</i>	7
Gambar 1.3 Cacat PCB Mouse Bite	7
Gambar 1.4 Cacat PCB Spur	8
Gambar 1.5 Cacat PCB Missing Hole	8
Gambar 1.6 Cacat PCB Spurious Copper	9
Gambar 2.1 Arsitektur MMDetection [16]	13
Gambar 2.2 Arsitektur ResNest-101 [16]	14
Gambar 2.3 Struktur OHEM	15
Gambar 2.4 Arsitektur CARAFE [17]	16
Gambar 2.5 Arsitektur Grid-RCNN [18]	17
Gambar 2.6 Arsitektur Res2Nest [20]	18
Gambar 3.1 Ilustrasi Model GUI	23
Gambar 3.2 Ilustrasi <i>Deep Learning</i>	24
Gambar 3.3 Flowchart GUI	27
Gambar 3.4 Flowchart Model Deep Learning	28
Gambar 3.5 Arsitektur ResNest [15]	29
Gambar 4.1 Cara Kerja Deteksi PCB Secara Umum	33
Gambar 4.2 Tampilan GUI	34
Gambar 4.3 Hasil Gambar Deteksi	35
Gambar 4.4 Block Sistem Deep Learning	36
Gambar 4.5 Proses Train Model [29] [23]	37
Gambar 4.6 Source Code Deep Learning	38
Gambar 4.7 Source Code Configuration Faster-RCNN ResNest-101	39
Gambar 4.8 Source Code Metode OHEM	39
Gambar 4.9 Akurasi dari model ResNest-101+OHEM	40
Gambar 4.10 Loss	40
Gambar 4.11 Nilai AP@50	41
Gambar 4.12 Nilai mAP	41
Gambar 4.13 Confusion Matrix ResNest-101 dengan metode OHEM	42
Gambar 4.14 Hasil Pengujian Model ResNest-101	43
Gambar 4.15 Hasil Pengujian ResNest+OHEM	44

Gambar 4. 16 Hasil Pengujian Deteksi Gambar Cacat PCB	45
Gambar 4.17 Hasil Pengujian Model Carafe	47
Gambar 4.18 Hasil Pengujian Model Grid-RCNN.....	48
Gambar 4.19 Hasil Pengujian Model Res2Net-101	48
Gambar 4.20 Hasil Pengujian Model Lain	50
Gambar 5.1 PCB Berhasil Terdeteksi.....	55