

DAFTAR PUSTAKA

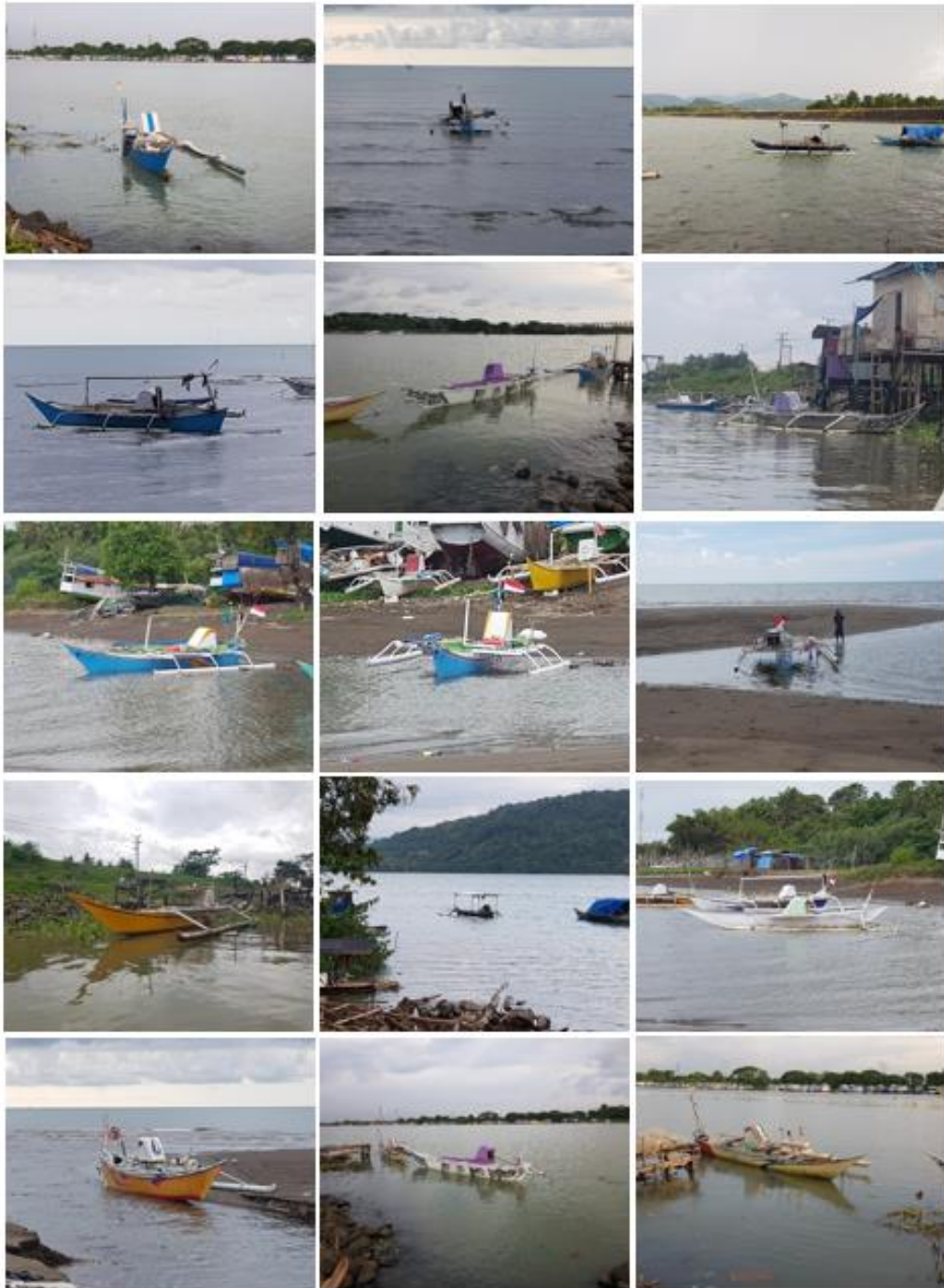
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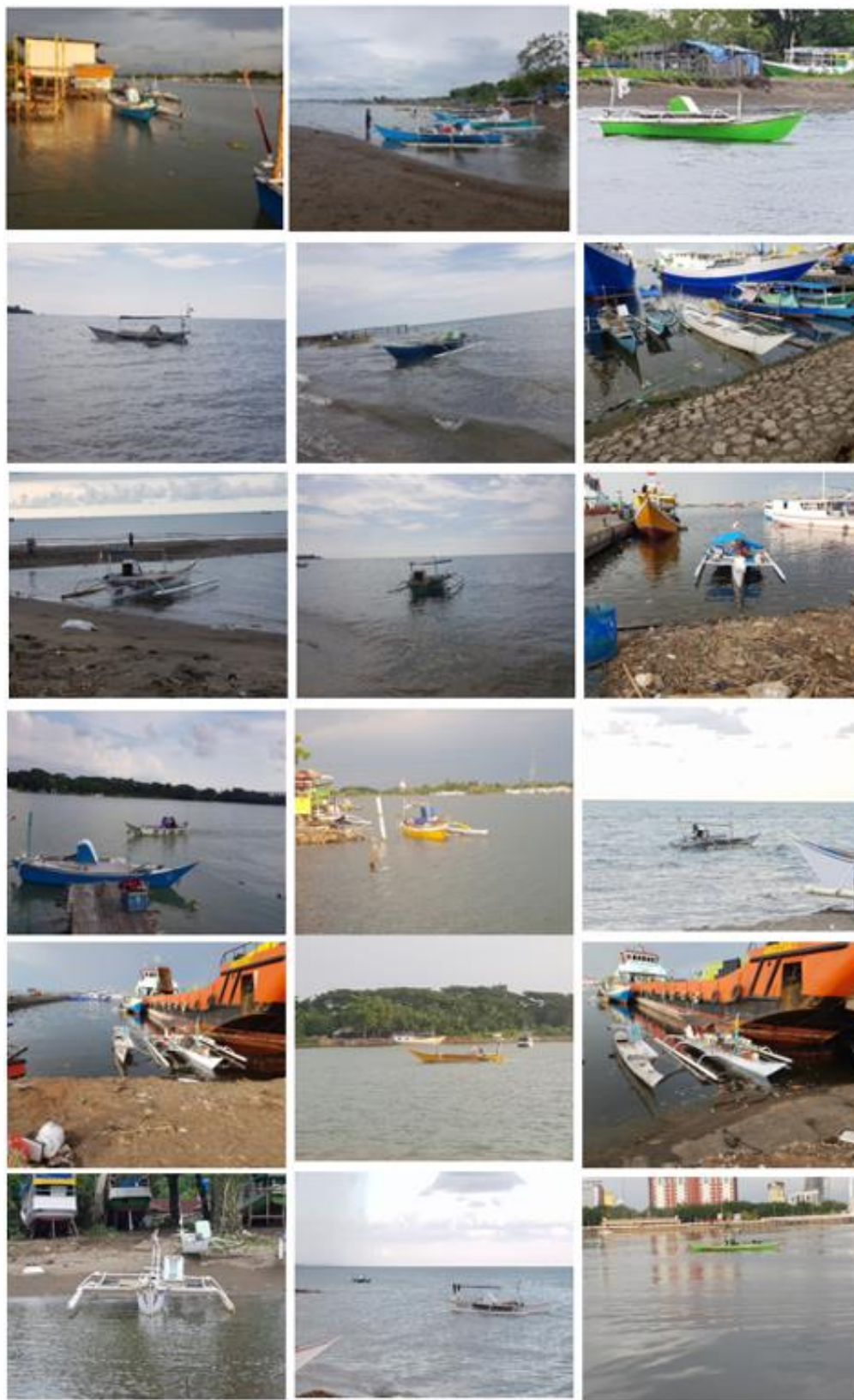
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LAMPIRAN

Lampiran 1. Contoh beberapa dataset primer





Lampiran 2. Kode

```
def get_live_zed():
    init = sl.InitParameters()
    init.camera_resolution = sl.RESOLUTION.HD1080
    init.camera_fps = 30

    runtime = sl.RuntimeParameters()

    cam = sl.Camera()

    # Check camera
    if cam.open(init) != sl.ERROR_CODE.SUCCESS:
        print("Zed tidak terdeteksi.")
        quit()

    return cam, runtime

def convert_bbox(x1, y1, x2, y2):
    xc = (x1 + x2)/2
    yc = (y1 + y2)/2
    width = (x2 - x1)
    height = (y2 - y1)
    return xc, yc, width, height

def load_model(path):
    print("\nLoading model...")
    result_model = torch.hub.load('yolov5', 'custom',
    source='local', path=path)
    result_model.conf = 0.25
    result_model.iou = 0.45
    result_model.classes = [0]
    return result_model
```

```

def score_frame(model, frameL, frameR):
    frameL = [frameL]
    frameR = [frameR]
    resultsR = model(frameR)
    resultsL = model(frameL)
    labelsL = resultsL.pandas().xyxy[0]
    labelsR = resultsR.pandas().xyxy[0]
    return labelsL, labelsR, resultsL, resultsR

def jarak(x1_L, x1_R, x2_L, x2_R, baseline, width_):
    xL = (x1_L + x2_L)/2
    xR = (x1_R + x2_R)/2
    meters = 100
    disparity = abs(xL-xR)
    f_length = 1000
    try:
        z_depth = ((baseline*f_length)/disparity)/meters
    except ZeroDivisionError:
        z_depth = 0
    return z_depth, disparity

def kecepatan (zdepth, waktu_seharusnya):
    konversi_knot = 1.944
    velocity = ((zdepth/waktu_seharusnya) * konversi_knot)
    return abs(velocity)

# Initial
device = 'cuda' if torch.cuda.is_available() else 'cpu'
waktuSeharusnya = 2
initialDistance = 0
B = 12
width = 1920
frame = 0
depth = 0
kec = 0

```



```

disp = 0
#kumpulanJarak = []
print("\nDevice Used:",device, end="\n")
# Get zed stereo camera
cam, runtime = get_live_zed()
model = load_model('./model/yolo_det_ship16.pt')
startTime = int(str(time.time()).split('.')[0])
while True:
    lc = sl.Mat()
    rc = sl.Mat()
    err = cam.grab(runtime)
    if err == sl.ERROR_CODE.SUCCESS :
        cam.retrieve_image(lc, sl.VIEW.LEFT)
        frameL = lc.get_data()
        frameLYOLO = cv2.cvtColor(frameL, cv2.COLOR_BGR2RGB)
    cam.retrieve_image(rc, sl.VIEW.RIGHT)
        frameR = rc.get_data()
        frameRYOLO = cv2.cvtColor(frameR, cv2.COLOR_BGR2RGB)
    else:
        print("Ada error di ZED Stereo camera")
        break
    key = cv2.waitKey(10)
    frame = frame + 1
    resultsL, resultsR, modelL, modelR = score_frame(model,
frameL, frameR)
    # Result L & R
    cordL = resultsL.iloc
    nL = len(resultsL)
    cordR = resultsR.iloc
    nR = len(resultsR)
    if nR==nL:
        for i in range(nL):

```

```

        rowRYolo = cordR[i]
rowLYolo = cordL[i]

        x1LYOLO, y1LYOLO, x2LYOLO, y2LYOLO =
int(rowLYolo[0]), int(rowLYolo[1]),
int(rowLYolo[2]), int(rowLYolo[3])
x1RYOLO, y1RYOLO, x2RYOLO, y2RYOLO =
int(rowRYolo[0]), int(rowRYolo[1]),
int(rowRYolo[2]), int(rowRYolo[3])
        text_d = 'perahunelayan'
        cv2.rectangle(frameL, (x1LYOLO, y1LYOLO),
(x2LYOLO, y2LYOLO), (0, 255, 0), 3) ## Bbox
cv2.rectangle(frameL, (x1LYOLO, y1LYOLO),
(x2LYOLO, y1LYOLO), (0, 255,0), -1) ## for text
label background
cv2.putText(frameL, text_d, (x1LYOLO, y1LYOLO -
10), cv2.FONT_HERSHEY_SIMPLEX, 1,(255,255,255),
3)

        cv2.rectangle(frameR, (x1RYOLO, y1RYOLO),
(x2RYOLO, y2RYOLO), (0, 255, 0), 3) ## Bbox
cv2.rectangle(frameR, (x1RYOLO, y1RYOLO),
(x2RYOLO, y1RYOLO), (0, 255,0), -1) ## for text
label background
cv2.putText(frameR, text_d, (x1RYOLO, y1RYOLO -
10), cv2.FONT_HERSHEY_SIMPLEX, 1,(255,255,255),
3)
    print(int(str(time.time()).split('.')[0]) -
startTime)
if int(str(time.time()).split('.')[0]) -
startTime >= waktuSeharusnya:
print("Depth updated!")
distance = round(depth,2) - initialDistance

```

```

kec = kecepatan(distance, waktuSeharusnya)
initialDistance = round(depth,2)
startTime =
int(str(time.time()).split('.')[0])
depth, disp = jarak(round(rowLYolo[0], 2),
round(rowRYolo[0], 2), round(rowLYolo[2], 2),
round(rowRYolo[2], 2), B, width)
#kumpulanJarak.append(round(depth, 2))
#print(f"Depth: {(round(depth,2))}")
#print(f"disp: {(round(disp,2))}")
print(f"kecepatan: {(round(kec,2))}")
print(f"Frame ke : {frame}")
#cv2.putText(frameR, f"Distance :
{round(float(depth),2)} m", (x1RYOLO + 5, y1RYOLO +
30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255,255,255),
3)
cv2.putText(frameR, f"Speed :
{round(float(kec),2)}
knot", (x1RYOLO + 5, y1RYOLO + 60),
cv2.FONT_HERSHEY_SIMPLEX, 1, (255,255,255), 3)
#cv2.putText(frameL, f"Distance :
{round(float(depth),2)} m", (x1LYOLO + 5, y1LYOLO +
30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255,255,255),
3)
cv2.putText(frameL, f"Speed :
{round(float(kec),2)}
knot", (x1LYOLO+ 5, y1LYOLO + 60),
cv2.FONT_HERSHEY_SIMPLEX, 1, (255,255,255), 3)
else:
    print(int(str(time.time()).split('.')[0]) -
startTime)
if int(str(time.time()).split('.')[0]) - startTime >=

```

```
waktuSeharusnya:
print("Depth updated!")
startTime = int(str(time.time()).split('.')[0])
    if(key == ord('q') or key == ord('Q')):
        break
frameL = cv2.resize(frameL, (640, 360),
interpolation=cv2.INTER_AREA)

frameR = cv2.resize(frameR, (640, 360),
interpolation=cv2.INTER_AREA)
cv2.imshow('deteksi kanan', frameR)
cv2.imshow('deteksi kiri', frameL)
    if(key == ord('q') or key == ord('Q')):
        break
# print("\n\n\n")
# for i in kumpulanJarak:
#     print(i)
# print(f"Jarak : {statistics.mode(kumpulanJarak)}")
cv2.destroyAllWindows()
print("Selesai")
```

DAFTAR PERBAIKAN

Andi Andhika Pangerang Pallampa – D121181511
Deteksi Kecepatan Pada Teknologi Kapal Tanpa Awak Menggunakan
Epipolar Geometri

Persentase pengurangan ukuran gambar dari dimensi asli 4032 x 3024 px ke 800 x 650 px	BAB III Halaman 20
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LEMBAR PERBAIKAN SKRIPSI

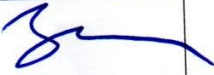
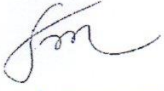

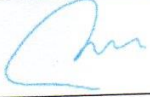
“Deteksi Kecepatan Pada Teknologi Kapal Tanpa Awak Menggunakan Epipolar Geometri”

OLEH:


**ANDI ANDHIKA PANGERANG PALLAMPA
D121181511**

Skripsi ini telah dipertahankan pada Ujian Akhir Sarjana tanggal 15 maret 2023.
Telah dilakukan perbaikan penulisan dan isi skripsi berdasarkan usulan dari penguji dan pembimbing skripsi.

Persetujuan perbaikan oleh tim penguji:

	Nama	Tanda Tangan
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