项目总体文档

概述

本文档提供对整个算法评估项目的概述。描述了所有数据，结构，接口和软件构件级别的设计。

本项目采用web作为前端，测试总体流程为

选择被测算法--->根据测试场景配备数据集--->将数据集路径传送给被测算法并执行test程序--->被测算法生成result.json文件--->读取结果文件并计算响应指标--->生成结果报表

本项目中所使用的术语及其对应关系

- 导引guidance-目标跟踪
- 导航navigation-图像配准
- 遥感remote_sensing-目标检测
- 语音voice-语音识别

运行环境

- 系统：Ubuntu 18.04
- cpu：2 × Intel(R) Xeon(R) CPU E5-2620 v3 @ 2.40GHz
- Mem：128GB
- gpu: 8 × GeForce GTX TITAN X

本地目录结构

目录总览

```
./
├── config
│   └── config.yaml
├── db
│   ├── adaptability
│   ├── basic_effectiveness
│   ├── customer
│   └── dependability
├── docs
│   ├── interface_documents.md
```

```
│   ├── tech.md
│   ├── 工作计划
│   └── 项目总体文档.md
├── log
│   └── debug.log
├── main.py
├── models
│   ├── ORB
│   ├── SiamDW
│   ├── voice_vosk
│   └── YOLOV5
├── requirements.txt
├── src
│   ├── app
│   └── utils
└── tmp
    ├── siamdw_2_latest
    └── siamdw_3_latest
```

目录功能及其说明

./config

程序所使用的配置文件，包括工程路径、对外开放端口、场景对应方法、关键指标阈值等

./db

样本库。

样本库目录结构

```
./db
├── adaptability # 用于存放进行可适应能力测试的样本
│   ├── guidance # 导引-目标跟踪
│   │   ├── condition_0 # 工况一
│   │   │   ├── config.json 记录当前工况的噪声配置信息
│   │   │   ├── infrared # 红外图像
│   │   │   ├── rgb # 可见光图像
│   │   │   └── sar # sar图像
│   │   ├── condition_1
│   │   │   ├── config.json
│   │   │   ├── infrared
│   │   │   ├── rgb
│   │   │   └── sar
│   │   └── readme.md
```

```
15 |    ├── navigation # 导航图像配准
16 |    |    ├── condition_0
17 |    |    |    ├── config.json
18 |    |    |    ├── infrared
19 |    |    |    ├── rgb
20 |    |    |    └── sar
21 |    |    ├── condition_1
22 |    |    |    ├── config.json
23 |    |    |    ├── infrared
24 |    |    |    ├── rgb
25 |    |    |    └── sar
26 |    |    └── readme.md
27 |    ├── remote_sensing # 遥感-目标检测
28 |    |    ├── condition_0
29 |    |    |    ├── config.json
30 |    |    |    ├── infrared
31 |    |    |    ├── rgb
32 |    |    |    └── sar
33 |    |    ├── condition_1
34 |    |    |    ├── config.json
35 |    |    |    ├── infrared
36 |    |    |    ├── rgb
37 |    |    |    └── sar
38 |    |    └── readme.md
39 |    └── voice # 语音
40 |        ├── condition_0
41 |        |    ├── config.json
42 |        |    ├── label.json
43 |        |    └── samples
44 |        ├── condition_1
45 |        |    ├── config.json
46 |        |    ├── label.json
47 |        |    └── samples
48 |        └── readme.md
49 ├── basic_effectiveness # 基础效能测试
50 |    ├── guidance
51 |    |    ├── infrared
52 |    |    |    ├── first_label.json # 目标初始框位置
53 |    |    |    ├── label.json #标注信息
54 |    |    |    └── samples # 图像序列
55 |    |    ├── readme.md
56 |    |    ├── rgb
57 |    |    |    ├── first_label.json
58 |    |    |    ├── label.json
59 |    |    |    └── samples
60 |    |    └── sar
61 |    |        ├── label.json
```

```
62 |   |   |   ├── first_label.json
63 |   |   |   └── samples
64 |   ├── navigation
65 |   |   ├── infrared
66 |   |   |   ├── label.json
67 |   |   |   └── samples
68 |   |   ├── readme.md
69 |   |   ├── rgb
70 |   |   |   ├── label.json
71 |   |   |   └── samples
72 |   |   └── sar
73 |   |       ├── label.json
74 |   |       └── samples
75 |   ├── remote_sensing
76 |   |   ├── infrared
77 |   |   |   ├── label.json
78 |   |   |   └── samples
79 |   |   ├── readme.md
80 |   |   ├── rgb
81 |   |   |   ├── label.json
82 |   |   |   └── samples
83 |   |   └── sar
84 |   |       ├── label.json
85 |   |       └── samples
86 |   └── voice
87 |       ├── label.json
88 |       ├── readme.md
89 |       ├── result.json
90 |       └── samples
91 |           ├── voice_war_0_0_100.wav
92 |           ├── voice_war_0_0_101.wav
93 └── dependability
94     ├── classical_confrontation
95     ├── false_target
96     └── special_coating
```

样本标注及算法输出格式

1. 导引guidance-目标跟踪
2. label.json

```
1 {
2     "task_type": "basic_effectiveness",
3     "scenario": "guidance",
4     "dataset_path": "db/basic_effectiveness/guidance/rgb/samples",
```

```
    "input_data_type": "PNG",
    "name_structure": "图像种类_噪声种类_噪声等级大小_图像编号.png, bndbox:[xmin, xma
    "output_data_type": "bounding_box",
    "labels": {
        "video_1": {
            "labels": {
                "rgb_gaussian_1_1.png": "[592, 642, 388, 437]",
                "rgb_gaussian_1_2.png": "[592, 644, 390, 439]",
                "rgb_gaussian_1_3.png": "[593, 639, 389, 436]",
                "rgb_gaussian_1_4.png": "[590, 643, 389, 437]"
            },
            "translation": "0",
            "scale": "1",
            "time": "0"
        }
    }
}
```


1. first_label.json


```
{
"task_type": "basic_effectiveness",
"scenario": "guidance",
"dataset_path": "db/basic_effectiveness/guidance/rgb/samples",
"input_data_type": "PNG",
"name_structure": "图像种类_噪声种类_噪声等级大小_图像编号.png, bndbox:[xmin, xmax, y
"output_data_type": "bounding_box",
"labels": {
    "video_1": {
        "rgb_gaussian_1_0.png": "[593, 649, 385, 438]"
        }
    }
}
```


1. result.json


```
{
    "task_type": "object_tracking",
    "scenario": "guidance",
    "input_data_type": "RGB",
    "output_data_type": "bounding_box",
    "results":
    {
```

```
    "sample_1":
    {
        "frame_id_1":"[x1, y1, x2, y2]",
        "frame_id_2":"[x3, y3, x4, y4]",
        "frame_id_3":"[x5, y5, x6, y6]"
    },
    "sample_2":
    {
        "frame_id_1":"[x1, y1, x2, y2]",
        "frame_id_2":"[x3, y3, x4, y4]",
        "frame_id_3":"[x5, y5, x6, y6]"
    },
    "sample_3":
    {
        "frame_id_1":"[x1, y1, x2, y2]",
        "frame_id_2":"[x3, y3, x4, y4]",
        "frame_id_3":"[x5, y5, x6, y6]"
    }
    }
}
```

1. 导航navigation-图像配准
2. lable.json

```
{
    "task_type": "basic_effectiveness",
    "scenario": "navigation",
    "dataset_path": "db/basic_effectiveness/navigation/rgb/samples",
    "input_data_type": "multispectral image",
    "output_data_type": "registered image",
    "labels": {
        "rgb_0.jpg": {
            "sample_id": "000",
            "image_path": "db/basic_effectiveness/navigation/rgb/samples/A/rgb_0
            "registered_image_path": "db/basic_effectiveness/navigation/samples/
            "patch_coor": [
                [
                    218,
                    66
                ],
                [
                    991,
                    25
                ],
                [
```

```
                    165,
                    1013
                ],
                [
                    939,
                    973
                ]
            ],
            "transform_matrix": [
                [
                    0.9011303257499389,
                    0.04986771017691723,
                    0.0
                ],
                [
                    0.040545406695801256,
                    0.7748300323038856,
                    0.0
                ]
            ]
        },
        "rgb_1.jpg": {
            "sample_id": "001",
            "image_path": "db/basic_effectiveness/navigation/rgb/samples/A/rgb_1
            "registered_image_path": "/db/basic_effectiveness/navigation/rgb/B/r
            "patch_coor": [
                [
                    377,
                    52
                ],
                [
                    1000,
                    6
                ],
                [
                    76,
                    987
                ],
                [
                    699,
                    940
                ]
            ],
            "transform_matrix": [
                [
                    0.916075228246426,
                    0.29462394826223426,
```

```
                    0.0
                ],
                [
                    0.06095605069008508,
                    0.81349899575391,
                    0.0
                ]
            ]
        },
        "rgb_2.jpg": {
            "sample_id": "002",
            "image_path": "db/basic_effectiveness/navigation/rgb/samples/A/rgb_2
            "registered_image_path": "db/basic_effectiveness/navigation/rgb/B/rg
            "patch_coor": [
                [
                    306,
                    260
                ],
                [
                    867,
                    81
                ],
                [
                    232,
                    1011
                ],
                [
                    793,
                    831
                ]
            ],
            "transform_matrix": [
                [
                    0.9682847486330034,
                    0.09571510978691272,
                    0.0
                ],
                [
                    0.2809327424796096,
                    0.8788981955072397,
                    0.0
                ]
            ]
        },
        "rgb_3.jpg": {
            "sample_id": "003",
            "image_path": "db/basic_effectiveness/navigation/rgb/samples/A/rgb_3
```

```
            "registered_image_path": "db/basic_effectiveness/navigation/rgb/B/rg
            "patch_coor": [
                [
                    315,
                    172
                ],
                [
                    933,
                    61
                ],
                [
                    135,
                    892
                ],
                [
                    753,
                    780
                ]
            ],
            "transform_matrix": [
                [
                    0.9309561124411962,
                    0.23280210672119378,
                    0.0
                ],
                [
                    0.17131463103979563,
                    0.9500645314027371,
                    0.0
                ]
            ]
        }
    }
}
```


1. result.json


```
{
    "task_type": "basic_effectiveness",
    "scenario": "navigation",
    "input_data_type": "multispectral image",
    "output_data_type": "registered image",
    "results":
    {
        "rgb_15.jpg":
```

```
        {
            "sample_id": "001",
            "patch_coor":[x1,y1,x2,y2],
            "transform_matrix": [[1.0, 0.0, -10.0], [0.0, 1.0, 20.0]]
        },
        "rgb_16.jpg":
        {
            "sample_id": "002",
            "patch_coor":[x1,y1,x2,y2],
            "transform_matrix": [[1.0, 0.0, -10.0], [0.0, 1.0, 20.0]]
        },
        "rgb_20.jpg":
        {
            "sample_id": "003",
            "patch_coor":[x1,y1,x2,y2],
            "transform_matrix": [[1.0, 0.0, -10.0], [0.0, 1.0, 20.0]]
        }
    }
}
```

1. 遥感remote_sensing-目标检测
2. label.json

```
{
    "task_type": "basic_effectiveness",
    "scenario": "remote_sensing",
    "dataset_path": "db/basic_effectiveness/remote_sensing/rgb/samples",
    "input_data_type": "png",
    "output_data_type": "bounding_box",
    "labels":
    {
    "rgb_gaussian_0.1_1.png":
    [
        {
        "class_name": "ship",
        "bbox": [10, 20, 100, 200]
        },
        {
        "class_name": "ship",
        "bbox": [30, 40, 120, 220]
        }
    ],
    "rgb_gaussian_0.1_2.png":
    [
        {
```

```
        "class_name": "ship",
        "bbox": [10, 20, 100, 200]
        },
        {
        "class_name": "ship",
        "bbox": [30, 40, 120, 220]
        }
    ]
    }
}
```

1. result.json

```
{
    "task_type": "basic_effectiveness",
    "scenario": "remote_sensing",
    "input_data_type": "RGB",
    "output_data_type": "bounding_box",
    "results":
    {
    "rgb_gaussian_0.1_1.png":
    [
        {
        "class_name": "ship",
        "bbox": [10, 20, 100, 200],
        "score": 0.8
        },
        {
        "class_name": "ship",
        "bbox": [30, 40, 120, 220],
        "score": 0.6
        }
    ],
    "rgb_gaussian_0.1_2.png":
    [
        {
        "class_name": "ship",
        "bbox": [10, 20, 100, 200],
        "score": 0.8
        },
        {
        "class_name": "ship",
        "bbox": [30, 40, 120, 220],
        "score": 0.6
        }
```

```
    ]
    }
}
```

1. 语音voice-语音识别
   label.json

```
{
"task": "basic_effectiveness",
"scene": "voice",
"dataset": "db/basic_effectiveness/voice/samples",
"input_type": "wav",
"output_type": "str",
"samples":
    {
    "voice_war_0_0_1.wav":"静态语音样本，语音识别正确率",
    "voice_war_0_0_2.wav":"为确保识别词序列和真值词序列之间保持一致"
    }
}
```

1. result.json

```
{
    "task": "basic_effectiveness",
    "scene": "voice",
    "dataset": "db/basic_effectiveness/voice/samples",
    "input_type": "audio",
    "output_type": "str",
    "results":
    {
        "voice_war_0.0_1.wav":"静台语音样本，语音识别帧确率",
        "voice_war_0.0_2.wav":"为确保识别词序列和真值词序列之间保持一致"
    }
}
```

./docs

记录有前后端接口文档、项目总体文档等

./log

运行日志存放目录

./models

被测算法存放目录。

被测算法以自身算法名称建立存放目录，如./models/SiamDW，被测算法运行时，
以./models/SiamDW为根目录。
则调用被测算法需

```
cd ./models/SiamDW && python test.py path_data
```

被测算法存放目录结构，必须包含以下内容

```
./models/SiamDW/
├── config
│   └── config.yaml # 需包含name、author、scene、default_cmd
├── README.md
├── requirements.txt
├── result
│   └── result.json # 结构详见<样本标注及算法输出格式>章节
├── test.py # 接收参数为被测样本路径
└── weight # 权重目标
    └── CIResNet22_RPN.pth
```

SiamDw/config/config.yaml

```
MODEL :
  name: SiamDW
  author: ZhangZhiPeng
  description: "Deeper and Wider Siamese Networks for Real-Time Visual Tracking"
  default_cmd: "python test.py path_data"
  scene: 0
  path_result: "./result"
```

./src

工程代码存放目录

./tmp

临时文件

./main.py

主程序

接口说明

详见前后端接口文档.md

界面设计及描述

基础配置

其他说明

注意事项

使用示例