Interface Specification

Algorithm

|  |  |  |
| --- | --- | --- |
| Date | Author | Description |
| 2021-4-28 | Ke Ren | Finish the first version. |
| 2021-5-1 | Ke Ren | Update the services. |
| 2021-5-4 | Ke Ren | Correct some grammar errors. |
| 2021-5-7 | Ke Ren | Change the output format and update the test cases. |

# Introduction

This document provides the detailed description of the interfaces between the Algorithm group and other groups.

# Services

This module can calculate the key points, the supporting points and the cobb angle given the spinal X-ray image path, and return the results based on the specific commands provided by the server.

## Services Provided

|  |  |  |
| --- | --- | --- |
| Service | Provided By | Tested By |
| User can get all the key points of the bone | KeyPoint Module | T1 |
| User can get all the supporting points that form the Cobb | KeyPoint Module,  Location Module | T2 |
| User can get all the calculated Cobb angle | KeyPoint Model,  Location Model,  CobbAngle Module | T3 |

## Access Method

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Access Method** | **Parameter name** | **Parameter type** | **Description** | **Exceptions** | **Map to services** |
| KeyPoint Module | keyPoint | json | json{  “status”: “success”,  “points”: [{  “1”: [x1, y1],  “2”: [x2, y2],  “3”: [x3, y3],  “4”: [x4, y4],  },  {……}  ]}  /\*  “1”: the left-top point;  “2”: the right-top point;  “3”: the left-bottom point;  “4”: the right-bottom point;  [xi, yi] means the location of the ith point.  \*/ |  | 1, 2, 3 |
| Location Module | locBone | json | json{  “status”: “success”,  “points”: {  {“1”: [[x1, y1], [x2, y2]]},  {“2”: [[x1, y1], [x2, y2]]},  }}  /\*  [xi, yi] means the mid points of one bone.  \*/ |  | 2, 3 |
| CobbAngle Module | angleCobb | json | json{  “status”: “success”,  “cobb”: “cb”  }  /\*  cb is the cobb angle value.  \*/ |  | 3 |

## Access Method Effects

|  |  |
| --- | --- |
| **Access Method** | **Description** |
| KeyPoint Module | User can get all the key points of the bone. The output could be used for the Location Model if needed. |
| Location Module | User can get all the supporting points that form the cobb. The output could be used for the Cobb Angle Model if needed. |
| CobbAngle Module | User can get the calculated cobb angle. |

## Services Required

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Access Method** | **Parameter name** | **Parameter type** | **Description** | **Exceptions** | **Map to services** |
| KeyPoint Module | imgPath\_cmdOpt | String array | Shape: [2]  Parameter 1: image path  Parameter 2: command |  | 1，2，3 |

# Local Types

|  |  |
| --- | --- |
| **Type** | **Value Space** |
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# Interface Design Issues

None.

# Test Cases

### T1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Description** | **Input Type/Value** | **Expected Results** | **Service** | **Preamble** |
| 1 | KeyPoint Module | imgPath\_cmdOpt (with command option “-keypoint”) | The user can get all the key points of the bone. |  |  |

### T2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Description** | **Input Type/Value** | **Expected Results** | **Service** | **Preamble** |
| 1 | KeyPoint Module | imgPath\_cmdOpt (with command option -locate) | The output ‘keyPoint’ is calculated and then passed to the Location Module. |  |  |
| 2 | Location Module | keyPoint | The user can get all the supporting points that form the cobb. |  | 1 |

### T3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Description** | **Input Type/Value** | **Expected Results** | **Service** | **Preamble** |
| 1 | KeyPoint Module | imgPath\_cmdOpt (with command option -cobb) | The output ‘keyPoint’ is calculated and then passed to the Location Module. |  |  |
| 2 | Location Module | keyPoint | The output ‘locBone’ is calculated and then passed to the CobbAngle Module. |  | 1 |
| 3 | CobbAngle Module | locBone | The user can get the cobb angle. |  | 2 |