Interface Specification

Algorithm

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| --- | --- | --- |
| Date | Author | Description |
| 2021-4-26 | Zachary Chen | Finish the first version. |
| 2021-5-6 | Zac & Carol & Doris | Change the format of outputs. |

# Introduction

This document is to specify the interface between algorithm and other modules.

# Services

This module can calculate results based on the spine X-ray image and command options provided by server.

## Services Provided

|  |  |  |
| --- | --- | --- |
| Service | Provided By | Tested By |
| User can get all the key points of the bone | Keypoint calculation | T1 |
| User can get the points of the bone that form the Cobb | Keypoint calculation,  Locate  calculation | T2 |
| User can get the Cobb value | Keypoint calculation, Locate calculation,  Cobb calculation | T3 |

## Access Method

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Access Method** | **Parameter name** | **Parameter type** | **Description** | **Exceptions** | **Map to services** |
| Keypoint calculation | keypoint\_detection | json(string) | e.g. {  “status”: “success”,  “points”: [  {  “x1”: “ ”, “y1”: “ ”,  “x2”: “ ”, “y2”: “ ”,  “x3”: “ ”, “y3”: “ ”,  “x4”: “ ”, “y4”: “ ”  },  {  ……  }  ]  }/\*(x1,y1),(x2,y2),(x3,y3),(x4,y4) respectively represent left-top, right-top, left-bottom, right-bottom locations of one bone\*/ |  | 1，2，3 |
| Locate  calculation | Bone\_location | json(string) | e.g. {  “status”: “success”,  “two\_points”: [  {  “x1”: “ ”, “y1”: “ ”,  “x2”: “ ”, “y2”: “ ”  },  {  “x1”: “ ”, “y1”: “ ”,  “x2”: “ ”, “y2”: “ ”}  ]  } /\*(x1,y1) and (x2,y2) are mid points of one bone.\*/ |  | 2，3 |
| Cobb calculation | Cobb\_angle | Json(string) | e.g. {  “status”: “success”,  “cobb”: “ ”  } /\*cobb is the value of cobb\*/ |  | 3 |

## Access Method Effects

|  |  |
| --- | --- |
| **Access Method** | **Description** |
| Keypoint calculation | User can get all the key points of the bone and the output of this module is then send to locate calculation as input if needed. |
| Locate  calculation | User can get the points of the bones that form the cobb and the output of this module is then send to cobb calculation if needed. |
| Cobb calculation | User can get the cobb value. |

## Services Required

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| --- | --- | --- | --- | --- | --- |
| **Access Method** | **Parameter name** | **Parameter type** | **Description** | **Exceptions** | **Map to services** |
| Keypoint calculation | Path\_&\_option | String array | Shape: (2)  First one is image path and second one is command option |  | 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 calculation | Path\_&\_option  (with option being “-keypoint”) | The user get all the keypoints of the bone. |  | 1 |

### T2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Description** | **Input Type/Value** | **Expected Results** | **Service** | **Preamble** |
| 1 | Keypoint calculation | Path\_&\_option  (with option being -locate) | The keypoints detection results are obtained and passed to locate calculation module. |  | 1 |
| 2 | Locate  calculation | keypoint\_detection | The user get the points of the bones that form the cobb. |  | 2 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Description** | **Input Type/Value** | **Expected Results** | **Service** | **Preamble** |
| 1 | Keypoint calculation | Path\_&\_option  (with option being -cobb) | The keypoints detection results are obtained and passed to locate calculation module. |  | 1 |
| 2 | Locate  calculation | keypoint\_detection | The bone location results are obtained and passed to cobb calculation module. |  | 2 |
| 3 | Cobb  calculation | Cobb\_angle | The user get the cobb value. |  |  |