StackProf

Logiciel de mesures sur profils empilés

version 1.01 (30 mai 2021)

Project (.jstackprof) json file format
English description

Object content description

Item name	Type	Value type	details
_descAbout_routePoint	key-value pair	string	Comment about point coordinate reference system and point index. String content value: "Points coordinates are [x, y] in pixel image coordinates. The top-let corner of top-left image pixel is [0.0, 0.0]. idPoint increases by 1 from first point to last point"
_noteAbout_imagesSet_geoRefInfos	key-value pair	string	Comment about the image indicated in the imagesSet_geoRefInfos object. String content value: "The image path and filename stored in imagesSet_geoRefInfos is not used at loading"
contentType	key-value pair	string	constant by app release String content value: "project"
versionFormat	key-value pair	string	constant by app release String content value: "0.8"
bUseGeoRef	key-value pair	boolean	Indicates if the project uses georeferencing
imagesSet_geoRefInfos	object		georeferencing data used by the project
computationMainMode	key-value pair	number (integer)	constant by app release. Value: 1
computationParameters	object		stacked profiles computation parameters
inputFiles	object		Project input files
pixelValueResolution	object		Pixel value resolution for each input component
route	route object		trace used in the project
stackedProfilBoxes	Array of projectBoxesSet object		
stackedProfil	array		

Sub-objects description

ImagesSet_geoRefInfos object

Item name	Type
coordRefSys_coordTrans	object
imageGeoRef	object

CoordRefSys_coordTrans object

Item name	Type	Value type	Details	Value example
EPSG_code	key-value pair	string	format is: EPSG:<string>	EPSG:32633

Example:

```
"coordRefSys_coordTrans": {
  "EPSG_code": "EPSG:32633"
}
```

For project not using georeferencing, the EPSG Code value is “notSet”:

```
"coordRefSys_coordTrans": {
    "EPSG_code": "EPSG:notSet"
}
```

ImageGeoRef object

Item name	Type	
pathAndFilename	object (PathAndFilename object)	Not used by project. Path and filename of the background image, set at project creation.
worldFileContent	object	World file data used in project

WorldFileContent object
World file data content as described here: https://en.wikipedia.org/wiki/World_file

Item name	Type	Value type	Details
0_A_xScale	key-value pair	number (double)	
1_D_rotationTerms_1	key-value pair	number (double)	
2_B_rotationTerms_2	key-value pair	number (double)	
3_E_yScale	key-value pair	number (double)	
4_C_xTranslationTerm	key-value pair	number (double)	
5_F_yTranslationTerm	key-value pair	number (double)	

Example:
```
"worldFileContent": {
  "0_A_xScale": 0.5,
  "1_D_rotationTerms_1": 0,
  "2_B_rotationTerms_2": 0,
  "3_E_yScale": -0.5,
  "4_C_xTranslationTerm": 350697.75,
  "5_F_yTranslationTerm": 4754094.75
}
```

ComputationParameters object

Item name	Type	Value type	Details
baseComputationMethod	key-value pair	string	mean | median
correlationScoreMapParameters	object		
pixelExtractionMethod	key-value pair	string	nearestPixel | biLinearInterpolation2x2 (2x2 means: four surrounding pixels)
profilOrientation	key-value pair	string	progressDirectionAlongTraceIsFromFirstToLastPoint | progressDirectionAlongTraceIsFromLastToFirstPoint

Example:
```
"computationParameters": {
  "baseComputationMethod": "median",
  "correlationScoreMapParameters": {
    "PX1_PX2": {
      "bUse": true,
      "option_thresholdRejection": {
        "bUse": true,
        "rejectValueIfBelow": 170
      },
      "option_weighting": {
        "bUse": true,
        "weightExponent": 2
      }
    },
    "ZOther": {
      "bUse": true,
```

```
      "option_thresholdRejection": {
        "bUse": false,
        "rejectValueIfBelow": 0
      },
      "option_weighting": {
        "bUse": false,
        "weightExponent": 6
      }
    }
  },
  "pixelExtractionMethod": "biLinearInterpolation2x2",
  "profilOrientation": "progressDirectionAlongTraceIsFromFirstToLastPoint"
}
```


CorrelationScoreMapParameters object

Item name	Type	Value type	Details
PX1_PX2	object		Presents only if project uses Px1 and Px2
ZOther	object		Presents only if project uses deltaZ

CorrelationScoreMapParameters PX1_PX2 and ZOther objects

Item name	Type	Value type	Details
bUse	key-value pair	boolean	indicates if the file is used as weighting
option_thresholdRejection	object		
option_weighting	object		

Option_thresholdRejection object

Item name	Type	Value type	Details
bUse	key-value pair	boolean	indicates if the option is used.
rejectValueIfBelow	key-value pair	number (double)	

Option_weighting object

Item name	Type	Value type	Details
bUse	key-value pair	boolean	indicates if the option is used.
weightExponent	key-value pair	number (integer)	range from 2 to 6

InputFiles object

Item name	Type
inputCorrelationScoreMaps	object
inputDisplacementMaps	object

InputCorrelationScoreMaps object

Item name	Type	Details
PX1_PX2	object (Input file with attributes object)	Object fields empty if correlation score map file not used.
ZOther	object (Input file with attributes object)	Object fields empty if correlation score map file not used

InputDisplacementMaps object

Item name	Type
PX1	object (Input file with attributes object)
PX2	object (Input file with attributes object)
ZOther	object (Input file with attributes object)

Input file with attributes objet

Item name	Type	Details
attributes	Object (FileAttributes object)	Presents only if the according input file is indicated. If attributes object exists, StackProf uses it to compare with the attributes from the according file (indicated in pathAndFilename). If any attributes do not match, the load of the file is rejected.
pathAndFilename	Object (PathAndFilename object)	

PixelValueResolution

Item name	Type	Details
PX1	object (micmacStep and spatialResolution object)	Presents only if project uses Px1 and Px2
PX2	object (micmacStep and spatialResolution object)	Presents only if project uses Px1 and Px2
ZOther	object (micmacStep and spatialResolution object)	Presents only if project uses deltaZ

Example :

```
  "pixelValueResolution": {
  "PX1": {
    "micmacStep": 1,
    "spatialResolution": 1
  },
  "PX2": {
    "micmacStep": 1,
    "spatialResolution": 1
 },
  "ZOther": {
    "micmacStep": 1,
    "spatialResolution": 1
  }
}
```

MicmacStep and spatialResolution object

Item name	Type	Value type	Details
micmacStep	key-value pair	number (double)	Value must be in range [0.0001, 999.999]
spatialResolution	key-value pair	number (double)	Value must be in range [0.0001, 999.999]

Route object

Item name	Type	Value type	Details
nbPoints	key-value pair	number (integer)	Number of points in the points array
routeId	key-value pair	number (integer)	routeId must start at 0 (zero). Increases by one for each route.
routeName	key-value pair	string	Valid characters: A to z A to Z 0 to 9 space _ (underscore) . (dot)
points	Array of Point2D (array)		Array of the trace points. (0.0, 0.0) matches with the top-let corner of top-left pixel of the image. x increases going to right. y increases going to down

Example:

```
{
  "nbPoints": 4,
  "points": [
    [
      13823.6513694,
      24796.2923689
    ],
    [
      13402.2889171,
      24397.1874568
    ],
    [
      12927.5075765,
      23904.8301561
    ],
    [
      12455.98149,
      23307.7094755
    ]
  ],
  "routeId": 1,
  "routeName": "trace 2"
}
```

Point2D array (double)

Item index	
0	x
1	y

ProjectBoxesSet object

Item name	Type	Value type	Details
_boxesSetID	key-value pair	number (integer)	internal usage (each projectBoxesSet has a unique _boxesSetID)
_ieDistanceBSBUAD	key-value pair	number (integer)	internal usage (indicates the type of distance used about automatic distribution)
boxes	Array of projectBox object	number (integer)	

ProjectBox object

Item name	Type	Value type	Details
boxId	key-value pair	number (integer)	Each box has a unique boxID in the file. Box Id starts from zero.
centerPoint	object (Point2D array)		coordinates in image pixel
oddPixelLength	key-value pair	number (integer)	
oddPixelWidth	key-value pair	number (integer)	
unitVectorDirection	object (Point2D array)		Normalized by the application
idxSegmentOwnerOfCenterPoint	key-value pair	number (integer)	Segment Id of the trace which contains the point. Segment Id starts from zero.

Example:

```
{
  "boxId": 0,
  "centerPoint": [
    13714.675,
    24693.073
  ],
  "idxSegmentOwnerOfCenterPoint": 0,
  "oddPixelLength": 1501,
  "oddPixelWidth": 301,
  "unitVectorDirection": [
    -0.726022,
    -0.6876715
  ]
}
```

StackedProfil object

Item name	Type	Value type
boxId	key-value pair	number (integer)
Parall	object	
Perp	object	
ZOther	object	

Parall, Perp and ZOther StackedProfil_rangesX0AndLinearRegressionModels object

Item name	Type
Bookmark	object
XRangesForLinRegr_withX0	object

Bookmark object

Item name	Type	Value type	Details
bWarningFlagByUser	key-value pair	boolean	Indicates if the user has flagged the profile (true means that the flag is on)

XRangesForLinRegr_withX0 object

Item name	Type
XRange_left	object (XRange object)
XRange_right	object (XRange object)
x0ForYOffsetComputation	object (X0ForYOffsetComputation object)

Example:

```
"XRangesForLinRegr_withX0": {
  XRange_left": {
    "XRange": {
      "bValid": true,
      "xMax": 0,
      "xMin": -5
    }
  },
  "XRange_right": {
    "XRange": {
      "bValid": true,
      "xMax": 5,
      "xMin": 0
    }
  },
  "x0ForYOffsetComputation": {
    "bValid": true,
    "x0": 0
  }
}
```

XRange_left and XRange_right LinearRegressionModel object

XRange object

Item name	Type	Value type	Details
bValid	key-value pair	boolean	
xMin	key-value pair	number (integer)	
xMax	key-value pair	number (integer)	

X0ForYOffsetComputation object

Item name	Type	Value type	Details
bValid	key-value pair	boolean	
x0	key-value pair	number (integer)	

PathAndFilename object

Item name	Type	Value type	Details
absolutePath	key-value pair	string	absolute path to the file with '/' character separating directories
filename	key-value pair	string	

Example:

```
"pathAndFilename": {
  "absolutePath": "/home/user2/test/directory",
  "filename": "Px1_Num5_DeZoom1_LeChantier.tif"
}
```

FileAttributes object

Item name	Type	Value type	Details
basetype	key-value pair	number (integer)	See Basetype description table
fileSize	key-value pair	number (integer)	file size in byte
height	key-value pair	number (integer)	image height in pixel
nchannels	key-value pair	number (integer)	image channels amount
width	key-value pair	number (integer)	image width in pixel

Example:

```
"attributes": {
  "basetype": 2,
  "fileSize": 812652858,
  "height": 31000,
  "nchannels": 1,
  "width": 24673
}
```

Basetype description table

Data type integer values come from OpenImageIO (include/OpenImageIO/typedesc.h)

Value in export file	Input file data type
2	unsigned byte
4	16 bits unsigned integer
5	16 bits signed integer
11	32 bits float (decimal)

Additional content file constraints

To be loaded by StackProf, the file content must follow some additional constraints described below.

contentType
Must exists with value: "project"

versionFormat
Must exists with value: "0.8"

computationMainMode
Must exists with value: 1

bUseGeoRef
. For project not using georeferencing, it must exist with value: false
. For project using georeferencing, existence is not mandatory. If it exits, its value must be: true

backgroundImage_geoRefInfos
It must exit.
. for project using georeferencing, "EPSG_code" numeric value must be known by the PROJ database used by StackProf
  (the PROJ database is the proj.db file provided with the software)
. worldFileContent
  . 0_A_xScale value and 3_E_yScale must have the same absolute value
  . 1_D_rotationTerms_1 and 2_B_rotationTerms_2 must be zero

Route object
The distance between successive points must be greater or equal to 1 (one) (unit: image pixel)

FileAttributes objects
These objects are typically feed by Stackprof. Stackprof uses these file attributes to check that the input files have similar attributes to input files used in the project previously (checking these attributes is not a warranty that the files have the same content but prevent some errors). For convenience, presence is not mandatory at file loading. This choice permits to simplify writing or editing a .jstackprof file by external edition.

pixelValueResolution
micmacStep and spatialResolution numeric values must fit in indicated range (2 to 6) and have:
. a maximum of four representatives decimals
. a maximum amount of representative numbers of six

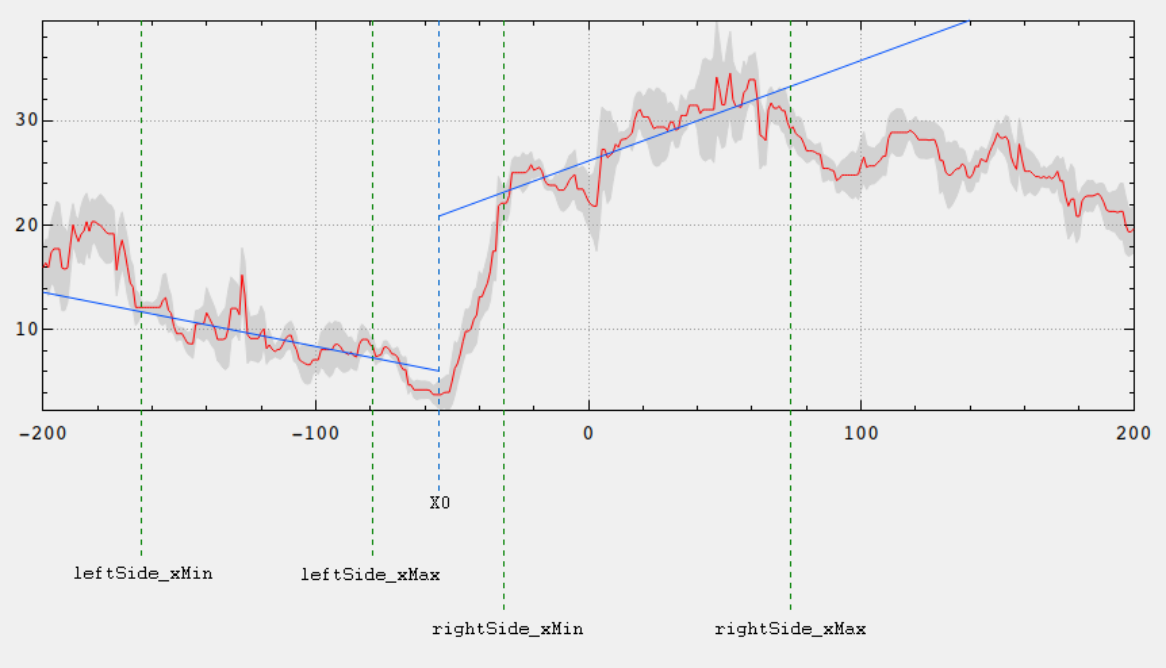
ProjectBoxesSet
_boxesSetID and _ieDistanceBSBUAD are used internally by StackProf. User does not have to alter or set these key-value pairs for external edition.

ProjectBox
. The centerPoint location must be closer, or equal, to a distance of 0.1 pixel from its perpendicular projection on its according trace segment (idxSegmentOwnerOfCenterPoint)
. oddPixelLength must be odd, and greater or equal to 3
. oddPixelWidth must be odd, and greater or equal to 3
. unitVectorDirection is feed by StackProf as a unit vector. But for easier external edition, it can be indicated as non-normalized.
  For example, it's possible to write (1, 3) instead of (0.31622, 0.94868)
  To be considered as a non-normalized vector, the length of the indicated unitVectorDirection must be greater than (1 + 0.001) or smaller than (1 – 0.001)
  In this case, Stackprof will compute, at file loading, the according unit vector value of unitVectorDirection and will use it.

Bookmark
For convenience, presence is not mandatory at file loading. If it exists it must be feed with a valid bWarningFlagByUser key-pair value.

XRangesForLinRegr_withX0

. For convenience, presence of bValid fields for XRange_left, XRange_right and x0ForYOffsetComputation are not mandatory at file loading.
. XRange_left.xMax must be greater than XRange_left.xMin
. XRange_right.xMax must be greater than XRange_right.xMin
. XRange_left.xMax must be smaller or equal to XRange_right.xMin
. XRange_left.xMax must be smaller or equal to x0
. XRange_right.xMin must be greater or equal to x0



Example of ranges and x0 locations

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