Chapter 1

Outil TripleSec : Test de non RegressIon Pour Les nouvElles verSions dE miCmac

1.1 Description

The TripleSec allows you to test new micmac implementations and to identify bugs and errors. The tool process a dataset and compare files, directories, calibrations, orientations or images with a reference repertory processed with a stable version of micmac.

1.2 Prerequisites

Before using micmac, you have to specify a dataset and process it with some classical micmac commands : Tapioca, Tapas, etc...

Now we will use the shorcut "Ref" for the reference directory usually named "TNR-Ref-#Name#" and "Exe" for the execution directory where we are processing with a new micmac version, usually named "TNR-Exe-#Name#".

1.3 Test structure

The dataset, the commands, and the particular test you wish to evaluate must be specified in a XML file at the same level as the work directory named "TNR-Exe-#Name#". To initialize this file, you must use a $< XmlTNR\_GlobTest >$ tag and specify the project name (#Name#) with a $< Name >$ tag as the following example :

```
<XmlTNR_GlobTest>
        <Name>Fontaine</Name>
</XmlTNR_GlobTest>
```

1.3.1 Dataset

First you have to specify the necessary data for processing (images, mask, calibration, GCP, etc.) via a $< PatFileInit >$ tag with the pattern of each files. Then you can make a purge of the execution directory with the $< PurgeExe >$ tag (use true for yes). For example :

```
<XmlTNR_GlobTest>
        <Name>Fontaine</Name> < !-- ProjectName -->
        <PatFileInit>A*JPG</PatFileInit> < !-- Pattern -->
        <PatFileInit>AIMG_2470_Masq.tif</PatFileInit> < !-- Mask -->
        <PatFileInit>AIMG_2470_Masq.xml</PatFileInit> < !-- Mask
        <PurgeExe>false</PurgeExe> < !-- Purge -->
</XmlTNR_GlobTest>
```

NB : You can also copy a complete directory with a $< DirInit >$ tag.

First TripleSec will create a repertory named "TNR-Exe-#Name#" and copy files and directories specified by tags inside.

1.3.2 Single test

The TripleSec tools process global tests, but inside the XML file, you can specify as many single test as you want. Each single test can contain a command, and type test (file, directory, etc...). So it provide to test files between each command. To initialize a single test yo can use the $< Tests >$ tag and add several arguments.

1.3.2.1 Commands tests

To test command, you can specify in a $< Cmd >$ tag. However, you must use one unique tag per single test. The command are those you are usually running with micmac. For example :

```
<Cmd>mm3d Tapioca All "TNR-Exe-Fontaine/.*JPG" 1000</Cmd> < !--Tapioca command -->
```

Tips : To choose your commands, you can use the file mm3d-logfile.txt in the Ref directory.

1.3.2.2 Files tests

This test provide you to check for files in Ref and Exe and compare it bit to bit. This is the syntax for a file test :

```
<TestFiles>
        <NameFile>AperiCloud_MEP.ply</NameFile> < !--File path -->
</TestFiles>
```

1.3.2.3 Directories tests

This tests provide you to check for directories in Ref and Exe and compare all the inside files bit to bit. This is the syntax for a directory test :

```
<TestDir>
            <NameDir>MM-Malt-Img-AIMG_2470/</NameDir> < !--directory path-->
</TestDir>
```

1.3.2.4 Calibrations tests

To compare two internal calibrations, you can use the following syntax :

```
<TestCalib>
        <NameTestCalib>Ori-MEP/AutoCal_Foc-18000_Cam-Canon_EOS_70D.xml</NameTestCalib>
</TestCalib>
```

Via this tag, you can execute the CmpCalib which can compare two calibrations :

```
mm3d CmpCalib Calib1 Calib2
```

This command return radial offsets for each ray and planimetrics offsets.

1.3.2.5 Orientations tests

For comparing two orientations, you can use the following syntax :

```
<TestOri>
        <NameTestOri>Ori-MEP</NameTestOri>
        <PatternTestOri>.*JPG</PatternTestOri>
</TestOri>
```

With this tag, you are running the CmpOri command which compare two orientations :

```
mm3d CmpOri pattern_images ori1 ori2
```

The command return : the average distance between rotation center and average distance between rotation matrix.

1.3.2.6 Image comparison

To compare two images, you can use the following syntax :

```
<TestImg>
        <NameTestImg>Ori-MEP</NameTestImg>
</TestImg>
```

Via this tag, you are running the command CmpIm, which compare two images :

```
mm3d CmpIm Img1 Img2
```

This command return : the different pixels number, the difference sum, the average difference and the maximal difference.

1.3.3 Synthesis

So this is a example for a global test :

```
<XmlTNR_GlobTest>
        <Name>  Fontaine       </Name>
        <PatFileInit> A*JPG </PatFileInit>
        <PatFileInit> AIMG_2470_Masq.tif </PatFileInit>
        <PatFileInit> AIMG_2470_Masq.xml </PatFileInit>

<!-- Test de la commande Tapioca + existence des fichiers Pastis -->
        <Tests>
                <Cmd>mm3d Tapioca All "TNR-Exe-Fontaine/.*JPG" 1000</Cmd>
                <TestDir>
                        <NameDir>Homol</NameDir>
                </TestDir>
        </Tests>

<!-- Test de la commande Tapas-->
        <Tests>
                <Cmd>mm3d Tapas RadialStd  "TNR-Exe-Fontaine/.*JPG" Out=MEP</Cmd>
                <TestDir>
                        <NameDir>Ori-MEP</NameDir>
                </TestDir>
                <TestCalib>
                        <NameTestCalib>Ori-MEP/AutoCal_Foc-18000_Cam-Canon_EOS_70D.xml</
                            NameTestCalib>
                </TestCalib>
                <TestOri>
                        <NameTestOri>Ori-MEP</NameTestOri>
                        <PatternTestOri>.*JPG</PatternTestOri>
                </TestOri>
        </Tests>

<!-- Test de la commande AperiCloud-->
        <Tests>
                <Cmd>cd TNR-Exe-Fontaine/ mm3d AperiCloud ".*JPG" MEP</Cmd>
                <TestFiles>
                        <NameFile>AperiCloud_MEP.ply</NameFile>
                </TestFiles>
        </Tests>

<!-- Test de la commande Malt GeomImage-->
         <Tests>
                <Cmd>mm3d Malt GeomImage "TNR-Exe-Fontaine/.*JPG" Ori-MEP Master=
                    AIMG_2470.JPG ZoomF=8</Cmd>
                <TestDir>
                        <NameDir>MM-Malt-Img-AIMG_2470/</NameDir>
                </TestDir>
        </Tests>

<!-- Test de la commande to8Bits-->
      <Tests>
        <Cmd>mm3d to8Bits TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-MALT.
            tif Circ=1 Coul=1</Cmd>
```

```
        <TestImg>
                <NameTestImg>MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-MALT_8Bits.tif</
                    NameTestImg>
        </TestImg>
    </Tests>

<!-- Test de la commande GrShade-->
    <Tests>
        <Cmd>mm3d GrShade TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-
            MALT.tif ModeOmbre=IgnE</Cmd>
            <TestImg>
                <NameTestImg>MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-MALTShade.
                    tif</NameTestImg>
            </TestImg>
    </Tests>

<!-- Test de la commande Nuage2Ply-->
        <Tests>
            <Cmd>mm3d Nuage2Ply TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/
                NuageImProf_STD-MALT_Etape_5.xml Attr=TNR-Exe-Fontaine/AIMG_2470.JPG
                 RatioAttrCarte=8 Out=TNR-Exe-Fontaine/fontaine.ply</Cmd>
            <TestFiles>
                <NameFile>fontaine.ply</NameFile>
            </TestFiles>
        </Tests>


        <PurgeExe> false </PurgeExe>
</XmlTNR_GlobTest>
```

1.4 Running TripleSec

To run the TripleSec command, you can open a terminal and launch :

```
mm3d TripleSec Fichier.xml
```

To know the different options, just type :

```
mm3d TripleSec -help
```

1.4.1 Mandatory unnamed arguments

You must specify a minima, the pattern of the XML file and if you are not using the InDir option, be sure that the directory containing the dataset is named TNR-Ref-#Name# :

1.4.2 Mandatory named arguments

This is the different options :
— OutXml : XML out file.
— InRefDir : Input Reference Directory.
— InExeDir : Input Execution Directory.

1.5 Outfile

If you are not using the option OutXml, the file will be named GlobTest.xml . It contains several types of tags disposed like the entry XML file.

1.5.1 GlobTestReport

This is the first test level, you can get easy informations about the results of the test via the $< Bilan >$ tag. If everything happened correctly it would contains **true** otherwise it would contains **false** . You can also know how many single test failed with the $< NbTest >$ and $< NbTestOk >$ tags. If they are fails, you can check each single test individually. Example :

```
<?xml version="1.0" ?>
<XmlTNR_GlobTestReport>
      <Bilan>true</Bilan> < !-- true = 0 fails-->
      <NbTest>4</NbTest> < !-- Single test nb-->
      <NbTestOk>4</NbTestOk> < !-- single test without fails nb-->
```

The tag $< XmlTNR\_GlobTestReport >$ contain several tags $< XmlTNR\_OneTestReport >$ corresponding to each test you have specified in the XML file.

1.5.2 La balise OneTestReport

This tags correspond to the single tests, they contains all types of tests discribe in the part one. You can check individually each single test, if it fail (**true**) or not (**false**) with the tag $< TestOK >$. Exemple :

```
<XmlTNR_OneTestReport>
            <TestOK>true</TestOK>
```

Inside this tags you found the results of the tests.

1.5.3 Les balises de tests

A lintérieur des balises ¡XmlTNR_OneTestReport¿ vous retrouvez les différentes balise de test :
- Command : $< XmlTNR\_TestCmdReport >$
- File : $< XmlTNR\_TestFileReport >$
- Directory : $< XmlTNR\_TestDirReport >$
- Calibration : $< XmlTNR\_CalibReport >$
- Orientation : $< XmlTNR\_OriReport >$
- Images : $< XmlTNR\_TestImgReport >$

1.5.3.1 Command report tag

- $< CmdName >$: command name
- $< TestCmd >$: ok (true) or fail (false)

Example :

```
<XmlTNR_TestCmdReport>
          <CmdName>mm3d AperiCloud "TNR-Exe-Fontaine/.*JPG" MEP</CmdName>
          <TestCmd>true</TestCmd>
</XmlTNR_TestCmdReport>
```

1.5.3.2 File report tag

- $< FileName >$: file name
- $< TestFileDiff >$: Comparison between Ref and Exe file (=,true,!=,false)
- $< TestExeFile >$: file exist in Exe
- $< TestRefFile >$: file exist in Ref
- $< ExeFileSize >$: size in Exe
- $< RefFileSize >$: size in Ref

Example :

```
<XmlTNR_TestFileReport>
          <FileName>AperiCloud_MEP.ply</FileName>
          <TestFileDiff>true</TestFileDiff>
          <TestExeFile>true</TestExeFile>
          <TestRefFile>true</TestRefFile>
          <ExeFileSize>377693</ExeFileSize>
          <RefFileSize>377693</RefFileSize>
</XmlTNR_TestFileReport>
```

1.5.3.3 Directory report tag

- $< DirName >$: directory name
- $< TestDirDiff >$: Comparison between Ref and Exe directory (=,true,!=,false)
- $< TestExeDir >$: directory exist in Exe
- $< TestRefDir >$: directory exist in Ref
- $< ExeDirSize >$: size in Exe
- $< RefDirSize >$: size in Ref
- $< MissingRefFile >$: file found in Exe and not in Ref
- $< MissingExeFile >$: file found in Ref and not in Exe
- $< FileDiff >$: file differents

Example :

```
<XmlTNR_TestDirReport>
        <DirName>Homol/PastisAIMG_2474.JPG</DirName>
        <TestDirDiff>true</TestDirDiff>
        <TestExeDir>true</TestExeDir>
        <TestRefDir>true</TestRefDir>
        <ExeDirSize>426568</ExeDirSize>
        <RefDirSize>426568</RefDirSize>
        <MissingRefFile>MM-Malt-Img-AIMG_2470/MakefileParallelisation</MissingRefFile>
        <MissingExeFile>MM-Malt-Img-AIMG_2470/MakefileParallelisation</MissingExeFile>
        <FileDiff>MM-Malt-Img-AIMG_2470/Z_Num4_DeZoom8_STD-MALT.xml</FileDiff>
</XmlTNR_TestDirReport>
```

1.5.3.4 Calibration report tag

- $< CalibName >$: calibratrion name
- $< TestCalibDiff >$: Comparison between calibrations (Ref,Exe)
- $< EcartRadiaux >$: radial offset between rays
- $< rEcartsPlani >$: planimetric offsets between pixels
  - $< CoordPx >$: pixel coordinates
  - $< UxUyE >$: offset

Example :

```
<XmlTNR_CalibReport>
        <CalibName>./TNR-Exe-Fontaine/Ori-MEP/AutoCal_Foc-18000_Cam-Canon_EOS_70D.xml</
            CalibName>
        <TestCalibDiff>true</TestCalibDiff>
        <EcartsRadiaux>3278.26276322315834 0</EcartsRadiaux>
        <rEcartsPlani>
                <CoordPx>5362.55999999999949 3575.03999999999996</CoordPx>
                <UxUyE>0 0 0</UxUyE>
        </rEcartsPlani>
</XmlTNR_TestDirReport>
```

1.5.3.5 Orientation report tag

- $< OriName >$: orientation name
- $< TestOriDiff >$: orientation comparison
- $< DistCenter >$: average distance between rotation centers
- $< DistMatrix >$: average distance between rotation matrix

Example :

```
<XmlTNR_OriReport>
        <OriName>MEP</OriName>
        <TestOriDiff>true</TestOriDiff>
        <DistCenter>0</DistCenter>
        <DistMatrix>0</DistMatrix>
</XmlTNR_OriReport>
```

1.5.3.6 Image report tag

- $< ImgName >$: image name
- $< TestImgDiff >$: Comparison between image in Ref and Exe (=,true,!=,false)
- $< NbPxDiff >$: number of different pixels
- $< SumDiff >$: difference sum
- $< MoyDiff >$: average difference
- $< DiffMaxi >$: maximal difference and coordinates

Example :

```
<XmlTNR_ImgReport>
        <ImgName>MM-Malt-Img-AIMG_2470/Z_Num7_DeZoom2_STD-MALT_8Bits.tif</ImgName>
        <TestImgDiff>false</TestImgDiff>
        <NbPxDiff>3.51130082984273881e-316</NbPxDiff>
        <SumDiff>6.95262359057922614e-310</SumDiff>
        <MoyDiff>6.95262359057922614e-310</MoyDiff>
        <DiffMaxi>0 0 0</DiffMaxi>
</XmlTNR_ImgReport>
```

1.6 Report synthesis

A example of a GlobTest.xml file :

```
<?xml version="1.0" ?>
<XmlTNR_GlobTestReport>
    <Bilan>false</Bilan>
    <NbTest>7</NbTest>
    <NbTestOk>4</NbTestOk>
    <XmlTNR_OneTestReport>
        <TestOK>true</TestOK>
        <XmlTNR_TestCmdReport>
            <CmdName>mm3d Tapioca All "TNR-Exe-Fontaine/.*JPG" 1000</CmdName>
            <TestCmd>true</TestCmd>
        </XmlTNR_TestCmdReport>
        <XmlTNR_TestDirReport>
            <DirName>Homol</DirName>
            <TestDirDiff>true</TestDirDiff>
            <TestExeDir>true</TestExeDir>
            <TestRefDir>true</TestRefDir>
            <ExeDirSize>2323530</ExeDirSize>
            <RefDirSize>2323536</RefDirSize>
        </XmlTNR_TestDirReport>
    </XmlTNR_OneTestReport>
    <XmlTNR_OneTestReport>
        <TestOK>true</TestOK>
        <XmlTNR_TestCmdReport>
            <CmdName>mm3d Tapas RadialStd "TNR-Exe-Fontaine/.*JPG" Out=MEP</CmdName>
            <TestCmd>true</TestCmd>
        </XmlTNR_TestCmdReport>
        <XmlTNR_TestDirReport>
            <DirName>Ori-MEP</DirName>
            <TestDirDiff>true</TestDirDiff>
            <TestExeDir>true</TestExeDir>
            <TestRefDir>true</TestRefDir>
            <ExeDirSize>88439</ExeDirSize>
            <RefDirSize>88440</RefDirSize>
        </XmlTNR_TestDirReport>
        <XmlTNR_CalibReport>
            <CalibName>./TNR-Exe-Fontaine/Ori-MEP/AutoCal_Foc-18000_Cam-Canon_EOS_70D.
                xml</CalibName>
            <TestCalibDiff>true</TestCalibDiff>
        </XmlTNR_CalibReport>
        <XmlTNR_OriReport>
            <OriName>MEP</OriName>
            <TestOriDiff>true</TestOriDiff>
            <DistCenter>6.95280409125905074e-310</DistCenter>
            <DistMatrix>6.95280409125905074e-310</DistMatrix>
        </XmlTNR_OriReport>
```

```
</XmlTNR_OneTestReport>
<XmlTNR_OneTestReport>
    <TestOK>true</TestOK>
    <XmlTNR_TestCmdReport>
        <CmdName>cd TNR-Exe-Fontaine/ mm3d AperiCloud ".*JPG" MEP</CmdName>
        <TestCmd>true</TestCmd>
    </XmlTNR_TestCmdReport>
    <XmlTNR_TestFileReport>
        <FileName>AperiCloud_MEP.ply</FileName>
        <TestFileDiff>true</TestFileDiff>
        <TestExeFile>true</TestExeFile>
        <TestRefFile>true</TestRefFile>
        <ExeFileSize>377693</ExeFileSize>
        <RefFileSize>377693</RefFileSize>
    </XmlTNR_TestFileReport>
</XmlTNR_OneTestReport>
<XmlTNR_OneTestReport>
    <TestOK>false</TestOK>
    <XmlTNR_TestCmdReport>
        <CmdName>mm3d Malt GeomImage "TNR-Exe-Fontaine/.*JPG" Ori-MEP Master=
            AIMG_2470.JPG ZoomF=8</CmdName>
        <TestCmd>true</TestCmd>
    </XmlTNR_TestCmdReport>
    <XmlTNR_TestDirReport>
        <DirName>MM-Malt-Img-AIMG_2470/</DirName>
        <TestDirDiff>false</TestDirDiff>
        <TestExeDir>true</TestExeDir>
        <TestRefDir>true</TestRefDir>
        <ExeDirSize>29660548</ExeDirSize>
        <RefDirSize>35817319</RefDirSize>
        <MissingRefFile>MM-Malt-Img-AIMG_2470/
            MakefileParallelisation24770_928_828_900</MissingRefFile>
        <MissingExeFile>MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-MALTShade.tif</
            MissingExeFile>
        <MissingExeFile>MM-Malt-Img-AIMG_2470/
            MakefileParallelisation23506_852_849_910</MissingExeFile>
        <MissingExeFile>MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-MALT_8Bits.tif</
            MissingExeFile>
        <MissingExeFile>MM-Malt-Img-AIMG_2470/NuageImProf_STD-MALT_Etape_5.ply</
            MissingExeFile>
        <MissingExeFile>MM-Malt-Img-AIMG_2470/
            MakefileParallelisation23506_880_380_384</MissingExeFile>
        <FileDiff>MM-Malt-Img-AIMG_2470/Z_Num4_DeZoom8_STD-MALT.xml</FileDiff>
        <FileDiff>MM-Malt-Img-AIMG_2470/Z_Num2_DeZoom32_STD-MALT.xml</FileDiff>
        <FileDiff>MM-Malt-Img-AIMG_2470/param_STD-MALT_Compl.xml</FileDiff>
        <FileDiff>MM-Malt-Img-AIMG_2470/TA_STD-MALT.xml</FileDiff>
        <FileDiff>MM-Malt-Img-AIMG_2470/Z_Num3_DeZoom16_STD-MALT.xml</FileDiff>
        <FileDiff>MM-Malt-Img-AIMG_2470/Z_Num1_DeZoom32_STD-MALT.xml</FileDiff>
        <FileDiff>MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-MALT.xml</FileDiff>
    </XmlTNR_TestDirReport>
</XmlTNR_OneTestReport>
<XmlTNR_OneTestReport>
    <TestOK>false</TestOK>
    <XmlTNR_TestCmdReport>
        <CmdName>mm3d to8Bits TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/
            Z_Num5_DeZoom8_STD-MALT.tif Circ=1 Coul=1</CmdName>
        <TestCmd>true</TestCmd>
    </XmlTNR_TestCmdReport>
    <XmlTNR_ImgReport>
        <ImgName>./TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-
            MALT_8Bits.tif</ImgName>
        <TestImgDiff>false</TestImgDiff>
        <NbPxDiff>311904</NbPxDiff>
        <SumDiff>43303016</SumDiff>
        <MoyDiff>138.834436236790793</MoyDiff>
        <DiffMaxi>676 0 216</DiffMaxi>
    </XmlTNR_ImgReport>
</XmlTNR_OneTestReport>
<XmlTNR_OneTestReport>
    <TestOK>false</TestOK>
```

```
        <XmlTNR_TestCmdReport>
            <CmdName>mm3d GrShade TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/
                Z_Num5_DeZoom8_STD-MALT.tif ModeOmbre=IgnE</CmdName>
            <TestCmd>true</TestCmd>
        </XmlTNR_TestCmdReport>
        <XmlTNR_ImgReport>
            <ImgName>./TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/Z_Num5_DeZoom8_STD-
                MALT_8Bits.tif</ImgName>
            <TestImgDiff>false</TestImgDiff>
            <NbPxDiff>311904</NbPxDiff>
            <SumDiff>43303016</SumDiff>
            <MoyDiff>138.834436236790793</MoyDiff>
            <DiffMaxi>676 0 216</DiffMaxi>
        </XmlTNR_ImgReport>
    </XmlTNR_OneTestReport>
    <XmlTNR_OneTestReport>
        <TestOK>true</TestOK>
        <XmlTNR_TestCmdReport>
            <CmdName>mm3d Nuage2Ply TNR-Exe-Fontaine/MM-Malt-Img-AIMG_2470/
                NuageImProf_STD-MALT_Etape_5.xml Attr=TNR-Exe-Fontaine/AIMG_2470.JPG
                RatioAttrCarte=8 Out=TNR-Exe-Fontaine/fontaine.ply</CmdName>
            <TestCmd>true</TestCmd>
        </XmlTNR_TestCmdReport>
        <XmlTNR_TestFileReport>
            <FileName>fontaine.ply</FileName>
            <TestFileDiff>true</TestFileDiff>
            <TestExeFile>true</TestExeFile>
            <TestRefFile>true</TestRefFile>
            <ExeFileSize>4057944</ExeFileSize>
            <RefFileSize>4057944</RefFileSize>
        </XmlTNR_TestFileReport>
    </XmlTNR_OneTestReport>
</XmlTNR_GlobTestReport>
```