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ttH(bb) analysis

- !INT note [↗](#)
- Meetings: <https://indico.cern.ch/category/6148/> [↗](#)

Framework AnalysisTop (see also AnalysisTop usage) and the TTHbbLeptonic package.

Variables definition:

- <https://twiki.cern.ch/twiki/bin/viewauth/AtlasProtected/TTHbbLeptonicTutorial>

Producing ntuples with MVA variables

Note that you should do it on LXPLUS only due to NeuroBayes and EOS dependences.

- Check-out OfflineAnalysisFramework

```
svn co svn+ssh://${USER}@svn.cern.ch/repos/atlasinst/Institutes/Manchester/Users/Johnny/OfflineAna
```

- Check-out, install and setup TTHbbLeptonic 2.3.45

```
svn export svn+ssh://"${USER}"@svn.cern.ch/repos/atlasphys-hsg8/Physics/Higgs/HSG8/AnalysisCode/TT
./install_TTHbbLeptonic.py --installDirectory=/afs/cern.ch/user/b/boldyrev/workdir/public/ttH/Ana
```

- Check-out FricoNN and setup environment for NeuroBayes

```
svn co svn+ssh://${USER}@svn.cern.ch/repos/atlasinst/Institutes/Goettingen/Matteo/FricoNN
source FricoNN/setup.sh
```

- To modify the selection one need to determine keeping and new variables as well as modify these lines in the configuration files

```
SKIM.jets >= 6
SKIM.btags >= 4
```

and select an output directory modifying this line:

```
CONFIG.output ../ttHntuples2016/ge6jge4b/ttH.root
```

Code usage (for new login)

```
source setup.sh
rcSetup
eosmount ../eos/
OfflineMVAVariableNtupleMaker OfflineAnalysisFramework/share/myConfig_ttH.txt OfflineAnalysisFram
```

HtX/4tops searches

- !INT note [↗](#)
- Meetings: <https://indico.cern.ch/category/3285/> [↗](#)
- TWiki: <https://twiki.cern.ch/twiki/bin/view/AtlasProtected/VLQand4top>

L1 production

```
svn co svn+ssh://svn.cern.ch/repos/atlasphys-exo/Physics/Exotic/HQT/VLQhtXHbXWb/Run2/Summer2016/Co
```

L2 Ntuples

Install OfflineTTHbb[↗]:

```
rc checkout_pkg atlasphys-hsg8/Physics/Higgs/HSG8/AnalysisCode/OfflineTTHbb/trunk OfflineTTHbb
```

Awesome TtHFitter/TRexFitter: <https://twiki.cern.ch/twiki/bin/view/AtlasProtected/TtHFitter>

MVA & NN

Aim: the integration of NeuroBayes, RMVA and other MVA tools into TMVA. And compare them all. Tools:

- NeuroBayes
- JetNet (see also:
<https://indico.cern.ch/event/484076/contributions/2002395/attachments/1246866/1836661/toShow.pdf>
)
- scikit-learn (<https://betatim.github.io/posts/sklearn-for-TMVA-users/>[↗])
- RMVA (<http://oproject.org/tiki-index.php?page=RMVA>[↗])

TMVA

Minimal ROOT v5.34/34 on lxplus for running TMVA 4.2.0:

```
./configure linuxx8664gcc --etcdire= /afs/cern.ch/user/b/boldyrev/workdir/private/root/etc --prefix  
./bin/thisroot.sh  
make  
make install
```

TMVA 4.2.1 works with ROOT v6.02.01

```
/afs/cern.ch/sw/lcg/releases/LCG_70root6/ROOT/6.02.01/x86_64-slc6-gcc48-opt
```

TMVA options reference <http://tmva.sourceforge.net/optionRef.html>[↗]

NeuroBayes

Setup NeuroBayes environment (same as FricoNN/setup.sh):

```
export PHIT_LICENCE_SERVER=lcgapp-slc6-physical2:16820  
#export PHIT_LICENCE_PATH=/afs/cern.ch/sw/lcg/external/neurobayes/license  
export NEUROBAYES=/afs/cern.ch/sw/lcg/external/neurobayes/3.16.0/x86_64-slc6-gcc44-opt  
export LD_LIBRARY_PATH=$NEUROBAYES/lib:$LD_LIBRARY_PATH  
export PATH=$NEUROBAYES/external:$PATH  
export CXXFLAGS="-I$NEUROBAYES/include"  
export LDFLAGS="-L$NEUROBAYES/lib -lNeuroBayesTeacherCPP -lNeuroBayesExpertCPP"
```

NeuroBayes TMVA plugin <https://github.com/sroecker/tmva-neurobayes>[↗]

FricoNN

TTHbbLeptonic package should be installed. Then check-out FricoNN and setup environment for NeuroBayes

```
svn co svn+ssh://${USER}@svn.cern.ch/repos/atlasinst/Institutes/Goettingen/Matteo/FricoNN
```

source FricoNN/setup.sh

ATLAS Documentation

Meetings (on non-regular basis):

- <https://indico.cern.ch/category/499/>

TWiki

- <https://twiki.cern.ch/twiki/bin/view/Main/TWikiSearchTesting> (note: the search scripts are very slow)
- <https://twiki.cern.ch/twiki/bin/view/Plugins/WebHome> Installed plugins

Doxygen

Original

- <https://www.stack.nl/~dimitri/doxygen/>

ATLAS Computing

- <http://atlas-computing.web.cern.ch/atlas-computing/links/nightlyDocDirectory/allpackages.html> summary of classes
- <http://atlas-computing.web.cern.ch/atlas-computing/links/nightlyDocDirectory/>
- <https://twiki.cern.ch/twiki/bin/view/AtlasComputing/DoxygenDocumentation>
- <https://twiki.cern.ch/twiki/bin/view/Atlas/DoxygenDocumentationLeftBar>
- <http://atlas-computing.web.cern.ch/atlas-computing/links/doxygenURLs.php> (OBSOLETE)

SVN

- <https://svnweb.cern.ch/trac/atlasoff/browser/Tools/AtlasDoxygen/trunk>

```
asetup 20.1.9, here
cd ~/Doxygen
cmt co Tools/AtlasDoxygen
setupWorkArea.py
cd WorkArea/cmt
make
cd ../doc
/afs/cern.ch/sw/lcg/releases/LCG_81b/doxygen/1.8.9.1/x86_64-slc6-gcc49-opt/bin/doxygen Doxyfile
```

Standalone ROOT 6 installation

```
source /afs/cern.ch/sw/lcg/external/gcc/4.9/x86_64-slc6/setup.sh
setupATLAS
lsetup "python 2.7.4-x86_64-slc6-gcc48"
export PYTHON_LIBRARY=/afs/cern.ch/sw/lcg/external/Python/2.7.3/x86_64-slc6-gcc48-opt/lib
export PYTHON_INCLUDE_DIR=/afs/cern.ch/sw/lcg/external/Python/2.7.3/x86_64-slc6-gcc48-opt/include
export PYTHON_EXECUTABLE=/afs/cern.ch/sw/lcg/external/Python/2.7.3/x86_64-slc6-gcc48-opt/bin/python
cmake . -DCMAKE_CXX_COMPILER=$(which g++) -DCMAKE_C_COMPILER=$(which gcc) -DCMAKE_INSTALL_PREFIX=
make install
```

Useful links

- <https://twiki.cern.ch/twiki/bin/view/Atlas/AtlasUdineDomain>
- <https://twiki.cern.ch/twiki/bin/view/Main/TipsForComputing> useful tips
- <https://twiki.cern.ch/twiki/bin/view/Main/MyDailyProblems> useful tips

- <https://twiki.cern.ch/twiki/bin/view/Main/LectureSerali> notes on LHC Physics
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Topic revision: r26 - 2017-04-25 - AlexeyBoldyrev



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