Graphical Tools : uMS and uPB

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Abstract

This document will give you a description of two graphical tools : MOOScope (uMS) and Playback uPB

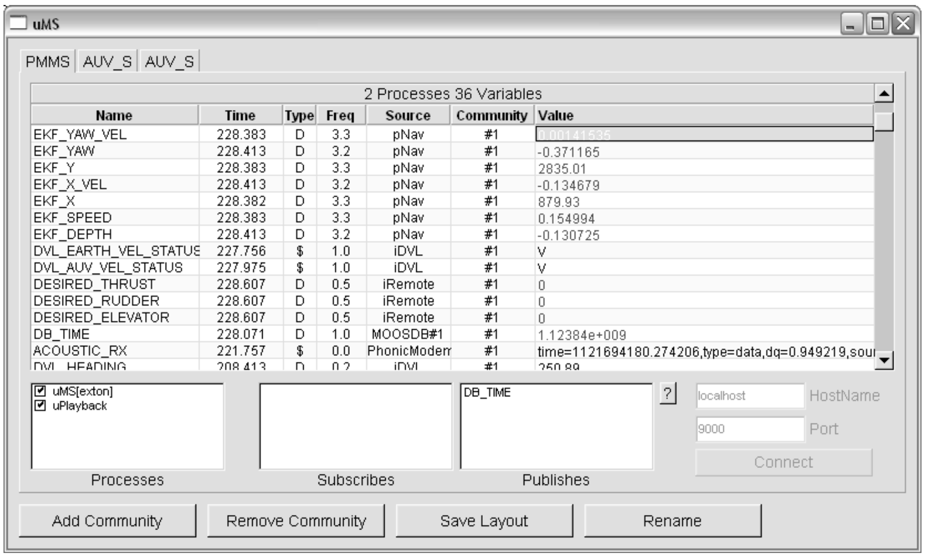
1 Visual Debugging - uMS

The uMS is another GUI application. It allows a user to place a stethoscope on the MOOS network and watch what variables are being written, which processes are writing them and how often this is happening. After starting up the scope and specifying the host name and port number of the MOOSDB the user is presented with a list of all MOOS variable in the server and their current state. Several times a second uMS calls into the DB and uses a special/unusual (and intentionally undocumented) message that requests that the server inform the client about *all* variables currently stored along with their update statistics. uMS is a central tool in the MOOS suite. It is cross platform and should be used to spy on and present visual feedback on any MOOS community.

1.1 Functionality Summary

Hopefully it will be pretty obvious how to use uMS as soon as you run it up. But here is a quick summary.

- Support for multiple communities via tabbed GUI.
- Memory of last settings (persistence)
- String expansion (click on long data strings and ballon appears.
- Show hide unassigned variables
- View subscriptions and publications on a per process basis by clicking on teh process list.
- Show hide messages from specific processes (shift-leftclick on the process list)



2 Processes 36 Variables

Name	Time	Type	Freq	Source	Community	Value
EKF_YAW_VEL	228.383	D	3.3	pNav	#1	0.00141535
EKF_YAW	228.413	D	3.2	pNav	#1	-0.371165
EKF_Y	228.383	D	3.3	pNav	#1	2835.01
EKF_X_VEL	228.413	D	3.2	pNav	#1	-0.134679
EKF_X	228.382	D	3.3	pNav	#1	879.93
EKF_SPEED	228.383	D	3.3	pNav	#1	0.154994
EKF_DEPTH	228.413	D	3.2	pNav	#1	-0.130725
DVL_EARTH_VEL_STATUS	227.756	$	1.0	iDVL	#1	V
DVL_AUV_VEL_STATUS	227.975	$	1.0	iDVL	#1	V
DESIRED_THRUST	228.607	D	0.5	iRemote	#1	0
DESIRED_RUDDER	228.607	D	0.5	iRemote	#1	0
DESIRED_ELEVATOR	228.607	D	0.5	iRemote	#1	0
DB_TIME	228.071	D	1.0	MOOSDB#1	#1	1.12384e+009
ACOUSTIC_RX	221.757	$	0.0	PhonicModem	#1	time=1121694180.274206,type=data,dq=0.949219,sou
DVL_HEADING	208.413	D	0.2	iDVL	#1	250.89

Processes: ☑ uMS[exton] ☑ uPlayback

Subscribes:

Publishes: DB_TIME

HostName: localhost

Port: 9000

Figure 1: A screen shot of `uMS` - a cross platform, multi-community MOOS Comms viewer.

- Poke the moos via ctrl-leftclick on a variable or empty cell (see Section 1.2)

1.2 Poking the MOOS

`uMS` has one other valuable use : poking the MOOS. It allows a user to double click on a variable name and alter its value (string or double) interactively. This is akin to changing memory contents in a source code debugging session. The difference here is that this action is a notification and all clients that are registered for it receive a message in their mail box and act on it accordingly. The utility of this functionality should not be underestimated. For example, during the commissioning of a new sensor (say a DVL) it may be unclear what the best configuration parameters are. For example by having the managing process subscribe for notifications on a `PARAMETERS` variable the `uMS` can be used to rapidly explore the performance/parameter space by simply poking new configuration describing strings into the `PARAMETERS` variable.

2 Replay with `uPB`

There is a FLTK-based, cross platform GUI application that can load in *alog* files and replay them into a MOOS community as though the originators of the data were really running and issuing notifications. A typical use of this application is to "fake" the presence of sensor processes when reprocessing sensor data and tuning navigation filters. Alternatively it can be used in pure replay mode perhaps to render a movie of the recorded mission. The GUI allows the selection of which processes are "faked". Only data recorded from those applications will be replayed from the log files. There is a single class that encapsulates all the replay functionality - `CMOOSPlayback` . The GUI simply hooks into the methods

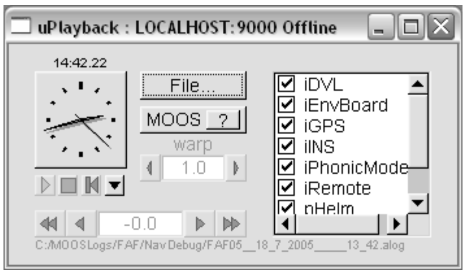

uPlayback : LOCALHOST:9000 Offline
14:42.22
File...
MOOS ?
warp
1.0
-0.0
iDVL
iEnvBoard
iGPS
iINS
iPhonicMode
iRemote
pHelm
C:/MOOSLogs/FAF/NavDebug/FAF05__18_7_2005_____13_42.alog

Figure 2: A screen shot of `uPB` - a cross platform "alog" playback tool

exported by this class. The GUI is almost self documenting - start it up and hold the mouse over various buttons and hint ballons will appear telling you what each buton does.

2.1 Controlling Playback Rate Progammatically

A client process can control the replay of MOOS messages by writing to the `PLAYBACK_CHOKE` variable add writing a valid time in the numeric message field. The Playback executable will not play more than a few seconds past this value before waiting for a new value to be written. In this way it is possible to debug (halt inspect and compile-in-place etc) at source level a client application using replayed data without having the playback rush on ahead during periods of thought or code-stepping.