

PAMGUARD Maintenance and Support Activities

1st July 2016 – 30th September 2016

Tasks Completed:

Bug Fixing

The following bugs were fixed using JIP support funds in this period:

- Bug 281. Click classification dialog has grown too big to fit on the screen. The options have now been split across three tabbed panes which solves the problem.
- Bug 282. Quiet clicks causing too many false classifications. An additional option has been added to the click classifier to limit a class to a range of amplitude.
- Bug 283. The spectrogram display was not displaying data in Viewer mode. This has been traced to a problem in offline data mapping and has been fixed. 1.
- Sound files in viewer data map. These were not being correctly catalogues in the datamap when using the PAMGuard viewer which meant that PAMGuard was not correctly loading sound data during offline analysis. This is now fixed.
- Bug 287. Slow database. This has been solved by setting the default behavior of the database to have Auto Commit set to 'off'
- Bug 288. Fixed problem of missing help file image
- Bug 290. Click bearings on spectrogram display plug in were reversed if the first hydrophone was behind the second hydrophone in the configuration. This is now fixed so that it displays the same bearings as the main click detector display.

Target Motion Tracking

Work on improved target motion tracking was completed in September and released in version 1.15.05.

Details are available in the online help. Users of the Click Detector will notice the following changes:

1. There is now a choice of least squares and Simplex based algorithms for real-time animal tracking. The improved algorithms also provide better error information both for display on the map and for storage in the database.
2. The number of data streams associated with the click detector has been tidied up so that there are a) All Click, b) Tracked Clicks (those which are part of an event) and c) Events.
3. When tracking online, all the click marking information is written to the same database tables as are used for offline target motion analysis. This means than when reviewing data offline, the tracks created in real time are now available for review and further analysis.
4. A number of user options are now available for automatic click train identification and tracking.
5. The automatic click train identification is now using the same internal structures as the manual tracking, so it's possible to combine automatic and manual tracking.
6. Improved options are available to the user, via the click detector bearing time display, to correct and relabel clicks / entire click trains.

Developers will hopefully find that the target motion code has been improved in a way which will make it much easier to provide target motion localization for other detection types (e.g. whistles) in the future.

A small number of bugs have been reported by users and these will be fixed in a release in late October 2016.

Other Improvements / Code Changes

Logger Form Design

A GUI driven system for designing Logger forms has been released. Currently, this feature has no online help, but is reasonably intuitive compared to the old method of typing directly into the database.

Improved Number handling

Users have often found that PAMGuard can be “jumpy”, i.e. the spectrogram does not scroll smoothly, but pauses for a second every few seconds. This is caused by the Java garbage collector cleaning up unused objects in memory. With 64 bit versions, which allow for more memory, some of these pauses were becoming quite long (due to the increased amount of memory that needed to be cleaned up). In some circumstances, these pauses were making data acquisition systems unstable. We have therefore entirely rewritten the way in which PAMGuard handles arrays of spectrogram data (complex numbers) so that instead of large numbers of small Java objects there are now fewer, larger, simpler java objects. These reduce processing delays for garbage collection and give an overall speed improvement, but will otherwise not be noticed by users.

Click Detector RainbowClick file output

This feature has been removed since it has been obsolete for several years. Users should use the PAMGuard binary storage system for Click Detector data.

Releases

V 1.15.04 was released in July 2016 and V 1.15.05 in September.

There were a total of 1551 downloads of V 1.15.04. To date there have been 148 downloads of V 1.15.05

Integration to the Tethys Database

A report has been developed outlining how PAMGuard might integrate with and exploit the functionality of the Tethys database system developed by Marie Roch of San Diego State University. This is attached to this report and will be posted on the PAMGuard website.

Staff

We are delighted to welcome Michael Oswald to the PAMGuard team in St Andrews. Mike has recently moved to the UK from San Diego. Mike has considerable PAMGuard programming experience having implemented the existing ROCCA whistle classifier in PAMGuard and also a number of other code changes, so with funding from JIP but also with a variety other funding sources. Mike is currently working a system for improving how third party modules integrate into PAMGuard and will slowly be taking over much of the day to day support and project management.

Other funding

The PAMGuard team in St Andrews have received funding from NOAA fisheries to make a number of changes to PAMGuard which will be of benefit to many users. In particular we will implement a system for improved data identification through a system of unique data identifiers added to every data record.

- Develop improved ways of linking data into groups, (similar to how clicks in the click detector can be grouped into click trains, but applicable to multiple data types).
- Selection, labelling and grouping of detections on the PAMGuard map
- Expansion of Detector Displays to include multiple detectors, for example so that you could view a bearing time like display for whistles and clicks together.

This work will be included in a release in the spring of 2017.

User Support

- 102 support emails were exchanged with users in this quarter in 6 different conversations, although the vast majority of these were with one company.

Voluntary Contribution System

Discussions have been ongoing with Vanishing Point. An agreement has now been made with the University and paperwork is in the process of being signed.

Forum #5

PAMGuard Maintenance Forum Meeting: Thursday 18th August 2016, 15:00

Attendees

- Doug Gillespie (SMRU)
- Rachael Plunkett (SMRU Consulting)
- Mark Higginbottom (MSeis)
- Mike Jenkerson (Exxonmobil / JIP)
- Jon Spink (Gardline)

Status of Voluntary Contribution System

Requests have recently been sent out to request usage for Q2 2016 and so companies signed up to the Framework Agreement are encouraged to reply with their PAMGuard usage as soon as possible so that we can get an estimate of how much money is coming in through the contributions and whether or not this will be sufficient to continue the current levels of maintenance work.

As per suggestions from the previous forum, each company signed up to the Framework Agreement was asked if they would be willing to back-date contributions to Q3/Q4 of 2015. None of the contributing companies felt they were able to do this given that invoicing and financial year accounts had already been completed for this period.

Discussion

Given the low level of contributions in Q1 2016 we were keen to find out if this was a) because there was a problem with the voluntary contribution system or if b) there had been a lack of PAMGuard usage in this period.

Mark stated that MSeis were swallowing the cost of the contributions themselves rather than passing it on to their clients. They have made clients aware of the contribution system but aren't passing on the costs. Mark requested that contributions could be made in either \$ or £. This has

been accepted by the University of St Andrews and is a sensible way forward to avoid the fees associated with exchanging currencies. It was discussed that a sensible exchange rate would be used, for example: the exchange rate on the date of the invoice of the work completed, or the date of the invoice for contributions etc.

Jon informed the forum that Nick no longer works for Gardline, and that himself and Breanna Evans would be participating in these discussions going forward. Rachael has been in contact with Breanna and provided her with past forum minutes, information packs and a copy of the Framework Agreement. Jon stated that Gardline are reviewing the Framework Agreement at the moment. It was again stated that if they were to sign up to the Framework Agreement then it would be likely that they would cover the contribution costs themselves rather than passing these costs on.

There is always a worry of increasing costs to clients and pricing themselves out of work. It was also highlighted that there has been very little work conducted recently given the current state of the industry. Currently most of the work being conducted is geophysical work – so it would be good to get feedback from IAGC.

The group noted that the key issue with the voluntary contribution system seems to be issues with the supply chain and passing costs on.

Mike noted that it was concerning that companies didn't feel they were able to pass the costs on to their clients, especially if those clients were JIP members. Mike was interested to know if specific discussions had been had between contributing companies and clients on this topic. The main problem highlighted here is that the owners of the PAM systems (the contributing companies) often rent equipment out to intermediary bodies rather than directly to the O&G companies themselves. For example, EPI, Hydenlyne and Geoguide were mentioned as examples of these intermediary bodies.

Doug outlined the issues he has employing programmers if there is not a steady funding stream for PAMGuard Maintenance. For example, if funding is only secure for a certain amount of time it is only possible to provide a short term contract to cover that time and there would be no guarantee of keeping the programmer employed beyond that. This is particularly an issue given the time it takes to train someone on the PAMGuard software. We have just employed a programmer on a 6 month contract to work on some of the PAMGuard Maintenance tasks, however, since there is no reliable funding beyond that, it cannot be guaranteed that this programmer will be able to continue beyond the end of this current contract. If not, then another programmer would need to be employed and trained as and when further funding becomes available. If voluntary contribution levels are too low to support a part time contract then it will become difficult to employ a programmer to work on the maintenance tasks.

Actions

- Feedback forum discussions to David Hedgeland
- Ensure that the University request PAMGuard usage in either \$ or £
- Contributing companies to please reply with Q2 usage
- Ensure the University follows up on PAMGuard usage requests– it would be preferred that companies rely with a zero amount if no PAMGuard usage is reported rather than not replying at all.

Forum #6

There were a lack of responses to this forum meeting and people were unavailable to attend. As a result it was decided that we would draft a letter to all forum members highlighting the status of the system to date. It is hoped that forum members will read this and be more engaged in the next

forum. This was planned for mid-late October but Doug is committed to other project work and so is not likely to be scheduled until end Oct-start Nov.

Here is the draft letter (not yet circulated to the forum):

Update on the PAMGuard Voluntary Contribution System

PAMGuard maintenance and support is provided through the University of St Andrews by a team of specialists. Historically the maintenance and support function has been supported through direct E&P industry funding via the IOGP Sound and Marine Life Joint Industry Programme. This funding stream will cease in March 2017 and transition to a self-funding mechanism.

It was estimated that in order to complete the general maintenance tasks such as code and website administration, user support, bug fixing and separate plug-ins, it costs approximately **£54,000** (~\$70,000) a year for programmer time.

Back in 2007 a voluntary levy system was proposed in order to support PAMGuard Maintenance using a suggested contribution amount of \$20 per PAMGuard day. This was considered to be too high a contribution value in the current market, and so the forum group (consisting of PAM equipment/service providers and JIP/industry representatives) agreed on a suggested contribution amount of \$5 per PAMGuard day. This new system has now been in place since January 2016 and 5 companies have signed up to the Voluntary Contribution Agreement to help ensure the continued maintenance and improvement of the PAMGuard software.

To date, contributions have been received from 2 companies: **Seiche and MSeis**. Contributions have been received for PAMGuard usage days between 2010 and 2016. These contributions have not yet been used as JIP funding has covered the work to date.

The aim of the next forum meeting will be to discuss the contributions collected to date and to hear peoples thoughts on the voluntary contribution system now that it has been up and running for 9 months. It would be good to discuss the contribution amounts collected so far for 2016 and what may be preventing companies from contributing. Opinions on the contribution system itself would be welcomed as well as any general discussions on how to progress with this system.

The exact date of the next forum is still to be arranged but will likely be around early November.

Downloads:

The web stats show a total of 2719 downloads of PAMGuard software between 1st July 2016 and 30th September 2016.

Activity Reports

Download Name	Downloads
Activity Report April to June 2016	35
Activity Report January to March 2016	43
Activity Report June 2012 to January 2013	10
Activity Report October to December 2015	108
Activity Report July to September 2015	75
Activity Report April to June 2015	24
Activity Report January to March 2015	19
Activity Report October to December 2014	19
Activity Report February 2012	14
Activity Report March - April 2012	23
Activity Report May - June 2012	10
Activity Report June to December 2012	72

General Configuration Files

Download Name	Downloads
DIFAR Configuration	57
Sperm Whale Click and Dolphin Whistle Detection	66
Sperm Whale Click Detection	50
Porpoise Click Detection	83

Likelihood Detector Configuration Files

Download Name	Downloads
Sperm Whale	37
Humpback	53
Bowhead Whales	50
Beaked Whale	52
Readme File	59

PAMGuard Software

Download Name	Total
1.15.05 32 and 64 Bit	107
1.15.04 32 and 64 Bit	1551
1.15.03 Core 32 Bit	58
1.15.03 Beta 64 Bit	722
1.15.02 Core 32 Bit	6
1.15.02 Beta 64 Bit	0
1.15.00 Beta 64 Bit	3

1.50.00 Core 32 Bit	8
1.14.00 Beta	61
1.13.05 Beta	45
1.13.04 Beta	2
1.13.03 Beta	0
1.13.02 Beta	2
1.13.01 Beta	0
1.13.00 Beta	34
1.12.06 Beta	1
1.12.05 Beta	112
1.06 Core	0
Beta 1.10.00	7
	2719

Publications

Download Name	Downloads
Consultancy: Modification to Data Identification	22
Free PAM software to improve marine mammal detection	25
A quick guide to PAMGuard	54
Free PAM software to improve marine mammal detection	25
PAMGUARD: Open Source Software For Real-time Acoustic Detection and Localisation of Cetaceans	141
Pamguard: Semiautomated, open source software for real-time acoustic detection and localisation of cetaceans	108

ROCCA Configuration Files

Download Name	Downloads
ETP Species Classifier	30

Details of registration information from the download pages are as follows:

Industry	Downloads
Oil & Gas	87
Civil Engineering	3
Offshore Wind	12
Tidal and Wave Energy	1
Academic Research	193
Other	108
Rather Not Say	19

Operation	Downloads
Real time mitigation	122

Abundance Estimation	95
8Behavioural Research	63
O61ther	115
Rather Not Say	25

Geographic	Downloads
US	118
Europe	164
Africa	20
Australasia	8
Asia	12
Other	88
Rather Not Say	25

Location	Downloads
Global	79
US	96
Europe	111
Africa	11
Australasia	4
Asia	12
Other	93
Rather Not Say	28