PAMGuard Maintenance and Support Activites

1 August to 28 February 2018

This report details work conducted by the University of St Andrews in continued support of the PAMGuard software using funds available through the voluntary contribution system.

Tasks Completed

Bug Fixing

A number of bugs have been fixed in PAMGuard:

- Bug 322. Fixed problem with Log event average and click templates not showing.
- Bug 323. Difar module. Fixed a couple of small bugs in the DIFAR system which caused it to not work if old configuratins were used.
- Bug 324. Occassional crashing in the AIS Module, as reported by user. Added warnings and more robust error handling.
- Bug 325. Fixed bug in complex addition/subtraction methods.
- Bug 328. Fixed bug in NMEA data flow which caused a Null pointer exception.
- Bug 330. Problem with certain FLAC files not being read properly. Upgraded jFLAC library to fix.
- Bug 332. Fixed problem with secondary maps (those not in the main display) not displaying detections.
- Bug 333. Fixed problem with data end times rounding incorrectly.
- Bug 334. GPS Dialog was causing the Pamguard window to resize
- Bug 335. UID's were being lost from click binary files when files were rewritten after data changes. This applied to clicks whch were not modified, but copied from the old file to the new.
- Bug 336. Loss of data from binary files when a maximum file size was set in viewer mode after some data had already been collected. If files larger than the new limit were reprocessed and rewritten, then the file size limit would be applied while rewriting the file.
- Bug 337. Pamguard Beta versions 2.00.11.c and earlier would fail to convert DIFAR binary files unless “Load clips” options were selected. This is now fixed.
- Bug 341. Rocca module creating PamRawDataBlocks that do not get garbage collected, and cause java memory problems over time
- Bug 342. Rocca does not load EncounterStats file properly
- Bug 343. Rocca not properly synchronized with Click Detector - either module may try to access data units that have already been removed
- Bug 344. Existing subtable data sometimes added as new entries in the subtable when running offline batch processing
- Bug 345. Offline Click Event reporting twice as many clicks as there actually are
- Bug 346. Incorrect error checking when setting up a Click Classifier species
- Bug 347. JFLAC library requires Java 8, causing problem when trying to add sound acquisition module on a computer with Java 7
- Bug 348. Map plot overlay menu not updating

- Bug 349. Clip generator overlay graphics sometimes crashing on map.
- Bug 350. Binary File size bug: If data were collected with a large size limit, then in viewer mode the file size limit is reduced files would get truncated.
- Bug 351. UID data being lost if binary files were being rewritten during offline processing
- Bug 352. UID branch click detector event marking was not correctly removing clicks from the events tables in the database.
- Bug 353. Data load information dialog was not updating correctly, particularly for the part of the task when grouped data are relinked to super detections.
- Bug 354. Whistle classifier crashing during training if the user puts in invalid parameters such as a fragment length < 3. Have added diagnostic messages to stop the user from being able to do this.
- Bug 355. PAMGuard crashing when Rocca tries to load a classifier file if the database is present. This has been fixed.
- Bug 356. Ishmael localiser losing raw data before it had time to localise. This has been fixed.
- Bug 357. For tracked groups, Difar was storing the latitude in both GroupLatitude and GroupLongitude database columns. This has been fixed to properly store longitude for GroupLongitude.
- Bug 358. Clip Generator not storing overlapping detections properly. The clip storage algorithm has been modified so that each detection will have the correct pre- and post-samples, regardless of overlap.
- Bug 359. Pamguard crashes when selecting auto-scale option in Noise Monitor module. This has now been fixed.
- Bug 360. LTSA data not loading in viewer mode. Problem was due to new dataload system not being implemented in Beta version. Now rectified and working OK.
- Bug 362 Bug in maximum likelihood bearing estimator grid search (used by the click and whistle detectors with volumetric arrays) occasionally caused the estimator to crash due to searching the wrong row in the x dimension after rounding the column number in the y dimension. This occurred rarely and is now fixed.
- Bug 363. Rocca classifier crashing if operator selects a whistle very close to the start of a file. This is now fixed.
- Bug 364. LTSA binary store record of FFT length. This could be incorrectly recorded if the FFT length was altered after the LTSA was configured which could cause confusion in some data sets. This has been fixed so that the correct FFT length is always recorded.
- Bug 365. When converting data from Core to Beta versions, the spectrograms are initially set up correctly. However, on the next restart, the spectrogram parameters are lost and the user is prompted to enter new parameters. The problem was that the Spectrogram Display was not registering itself when using parameters from the Core version, which stored parameters differently than the Beta version. This has been fixed.

New Features

1. Linked Rocca module to the Sound Acquisition Module. When running auto-detectors (Whistle & Moan or Click Detector), Rocca will now automatically change the Event number when the source file changes.
2. Added sound playback and other useful information to bar on FX display
3. Updates/bug fixes to the landmark module.
4. Added a simulated white noise source which can be moved around in the same way as other sources.

5. Reworked annotation system, and added annotations to binary storage
6. Added 3D rotation to map display. Hold down the shift key while clicking and dragging on the map to see this in action.
7. Added database logging and other updates to the Click Detector trigger function
8. Added circular movement option to sound source simulation
9. Map can be rotated in three dimensions to see localisation depth more easily in cases where 3D tracking is available.

Software Releases

PAMGuard version 1.15.13 and PAMGuard Beta version 2.00.12 were both released in January 2018. The core version contained the above bug fixes up to bug number 348, while the beta version contained both bug fixes to No. 354 and the new features listed above. Major development continues in the Beta branch, with the continued view of transitioning this to the main PAMGuard version for all users in 2018. The core branch continues to receive bug fixes, but new development is limited.

Ongoing Developments

As part of other industry funded projects, we are in the process of developing four new PAMGuard modules. We hope that these will be released for general use later this year.

Beam former

A basic beam former which can provide frequency domain beam forming from both linear and volumetric arrays, the output of the beam former being compatible with many PAMGuard detectors.

Bearing Localiser

A general bearing localizer which can estimate one or two dimensional bearings from linear and volumetric arrays respectively. This has both time of arrival difference and beam forming algorithms available.

Crossed Bearing Localiser

Takes bearings from multiple sub arrays (which may or may not have used the above Bearing Localiser) and works out their crossing point to determine a localization in 2 or 3 dimensions.

GPL Detector

This is an implementation of the generalized power law detector described in Helble, T. A., Ierley, G. R., Gerald, L. D., Roch, M. A., and Hildebrand, J. A. (**2012**). “A generalized power-law detection algorithm for humpback whale vocalizations,” J. Acoust. Soc. Am., **131**, 2682–2699.

Downloads

There have been 225 downloads of core version 1.15.13 and 34 downloads of beta version 2.00.12 since their release in January. There have also been 472 downloads of the older core version 1.15.12b and 53 of beta version 2.00.11c during this same period.

Support

The team received and answered 108 support emails during this period. The total time spent on support and maintenance (bug fixing, preparing releases, etc.) in this period was 38 days + 1 day admin.