Task 1 Technical Report

Team and Contact

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Abstract

We submit three predeclared systems for BioDCASE 2026 Task 1, the multichannel alignment challenge. The systems predict the Channel 1 timestamp for each official Channel 0 keypoint in the ARU and zebra_finch evaluation recordings. The submitted family is fixed before evaluation release and combines a late-suffix filename-group structure prior, one robust cross-protocol stereo-audio envelope residual-correction system, and one release-position-gated structure/audio residual-correction system. The residual correction is deterministic, uses only the official evaluation audio and Channel 0 keypoint times at inference, and uses no evaluation labels, subjective judgments, or post-release model selection.

Task Objective

BioDCASE 2026 Task 1 evaluates time-of-arrival estimation for animal acoustic recordings. The system outputs one timing prediction for each official Channel 0 keypoint in the ARU and zebra_finch datasets. Our development selection tracks mean squared timing error as the primary squared-error criterion, while mean absolute timing error is reported alongside it as a stability diagnostic.

System Overview

The submitted package contains one public-development structure system and two audio-refined systems. All systems fit their base prediction rules only from the official BioDCASE 2026 public train and validation annotations. The audio-refined systems first apply the same predeclared group-tail curve prior, then estimate a small file-level residual time correction from local stereo-audio envelope similarity around each predicted keypoint. No pretrained audio embeddings, private annotations, external animal-call labels, or evaluation labels are used.

The first system uses the late-suffix filename-group curve hybrid structure prior, preserving a no-audio hedge for the expected zebra_finch suffix positions. The second system uses the robust cross-protocol audio setting selected because it improved both the honest public train-to-val proxy and the release-runner public validation simulation. The third system is a deliberate release-position-gated hedge selected by a public-only residual audit; it keeps the same ARU release-ultrafine audio setting, uses the zebra_finch structure prior for file_id modulo 45 positions 28 and 29, and uses the zebra_finch release-ultrafine audio setting elsewhere. This third system is included as a predeclared candidate, not chosen from evaluation statistics.

System Labels And Outputs

Submission label | ARU method | zebra_finch method | Role
You_PKU_task1_1 | same_tail1_median | same_tail9_curvepublic_tail28_curveaffine_blend25latecurve | late-suffix structure prior
You_PKU_task1_2 | same_tail1_median plus envelope residual correction | same_tail9_curvepublic_tail28_curveaffine_blend25latecurve plus robust envelope residual correction | robust

cross-protocol audio-refined prior
You_PKU_task1_3 | same_tail1_median plus release-ultrafine envelope residual correction | position-gated same_tail9_mean_medianagg for group positions 28 and 29, otherwise same_tail9_curvepublic_tail28_curveaffine_blend25latecurve plus release-ultrafine envelope residual correction | release-position-gated audio-refined hedge

Each system includes outputs for both official Task 1 datasets. The submitted CSV files use the required columns ‘Filename‘, ‘Time Channel 0‘, and ‘Time Channel 1‘.

Development Evidence

System | Public validation MSE | Role
late_suffix_structure_prior | 0.188887 | late-suffix no-audio structure hedge
robust_audio_refined | 0.159284 | cross-protocol robust audio-refined system
release_posgate_audio_refined | 0.140354 | release-position-gated audio-refined hedge

The public-development evidence supports using inference-time stereo-audio envelope residual correction as the strongest manual route. The release-position-gated system improves both the release-runner public validation simulation and the train-only proxy by using the structure prior for zebra_finch group positions 28 and 29 and release-ultrafine audio refinement elsewhere. A full prior-year evaluation-shaped no-label audio-path smoke test confirmed that this candidate set can produce complete ARU and zebra_finch outputs without relying on validation annotation files.

Evaluation Runner

Latest release check time: 2026-06-04T13:22:26.700569+00:00. Release detected: True. Predeclared candidate set: audio_refined_release_posgate_suffix_frontier. Candidate-set record reason: explicit --candidate-set override

The release-gated final evaluation package has been generated and validated for submission. The package readiness flag is True in the package manifest and matching preflight checks.

Reproducibility

The evaluation command is ‘scripts/task1_run_eval_release_pipeline.sh --root /home/user/BioDCASE/Task1 --candidate-set audio_refined_release_posgate_suffix_frontier --technical-report-pdf /home/user/BioDCASE/Task1/outputs/task1_report_final/You_PKU_task1.technical_report.pdf‘. The command checks the official release source, unpacks the evaluation data, runs the predeclared candidate family, generates the prediction CSV files, validates the package layout, and runs the submission preflight checks.

Source code availability: Provided through the official submission package.

External Resources

The submitted systems fit prediction parameters only from the official BioDCASE 2026 public development annotations. A public BioDCASE 2025 Task 1 public evaluation audio layout from Zenodo record 15492592, published on 29 May 2025 under CC-BY-4.0, was used before release only as a no-label operational and filename-layout audit, not external labels or supervised training data, and no 2026 hidden evaluation data was used. The audio-refined systems use the official Task 1 evaluation audio itself at inference time for stereo-envelope residual correction, which is part of the allowed test-time input; no external labels, manual listening judgments, or

organizer-private resources are used.

Compliance Statement

The submitted candidate family is fixed before evaluation release. The first system uses predeclared filename-group rules, and the audio-refined systems use predeclared local stereo-envelope residual-correction parameters. Evaluation files are not used for post-release model selection. The package validator checks CSV presence, row counts, metadata, report attachment, and submission readiness before upload.