Under “Implementation”, a file starting with “b” and then a number is the beginning of the name of a matlab script located in the file “birdsongQBH”, which is synchronized with github.

Gray text indicates that this step is completed

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| **Step** | **Scale** | **Details/notes** | **Implementation/parameters/choices unsure about** |
| Species selection |  | Desirable qualities (to be ‘imitable’)   * + Slow   + Tonal   + Stereotyped   Good   1. Northern cardinal (Cardinalis cardinalis) 2. Black-capped chickadee (Poecile atricapillus) 3. Mourning dove (Zenaida macroura) 4. White-throated sparrow (Zonotrichia albicollis) 5. ~~Veery (Catharus fuscescens)~~ harmonics aren’t good for YIN-bird 6. Red-eyed vireo 7. Sora 8. E~~astern screech-owl~~ too-few good recordings 9. common yellowthroat 10. prairie warbler |  |
| Data collection: Examples |  | * Xeno-Canto ([mass download via api](https://www.xeno-canto.org/article/153)) | downloadXC.m (function for downloading)  B8 (script implementing function) |
| Publish data |  | * Publish online on [Zenodo](https://zenodo.org/)   + Create release notes | BirdsongQBH\_ZenodoReleaseNotes.txt |
| Data collection: Queries |  | * Record on laptop |  |
| Waveform | Samples |  |  |
| Preprocessing | Samples | * Voice Activity Detection? (to eliminate background tonal sounds)   + First check if such sounds are problematic   + Presence of background species is available in Xeno-Canto     - Download html of recording webpage     - Search for line that indicates “none” for “background” | b6 (check for background species) |
| Pitch Curve | Frames | Spectrogram | yb\_spectrogram  yb\_spectrogram\_fig   * wsize (sec) = .01 * hop (sec) = wsize/2 * minf0 (Hz) = * maxf0 (Hz) = 8000 |
| Frames | Prominent-frequency curve (Fprom)  (t by 1 vector, t is time in hops)   * Find frequency with max. power in each spectrogram frame * set max-power frequencies to NaN if they are below the mean max-power frequency (across frames) | ~~yb\_fprom~~  yb\_minf0   * frames = spectrogram hops  (i.e., wsize/2) * (?) take mean of values above 0 |
| Segments | Minimum-frequency curve (minf0) for dynamically setting the min. frequency of YIN  (s by 1 vector, s is time in segments)   * for each segment of Fprom, set the minf0 curve to the minimum in that segment * if there is no prominent frequency in the segment, set the minf0 value to the nearest neighbor. If the prior and posterior neighbors are equidistant, prefer prior. | yb\_minf0   * ssize (sec) = 0.068 sec segment size (used in YIN-bird, O’Reilley & Harte, 2017) * Subtract 2 Hz from minf0 to account for frequency discretization into bins * round down minf0 to nearest 100 Hz (O’Reilley & Harte, 2017 round up or down) |
| Frames | YIN-bird – dynamically set the minimum-frequency value for YIN   * calculate a YIN pitch curve for each unique value of minf0 * for each segment, take the pitch-curve segment from the pitch curve that was calculated with the minimum f0 for that segment * concatenate segments | yb\_yinbird   * wsize=same as spectrogram * hop = same as spectrogram * maxf0 = * ssize=same as minf0 |
| Segmentation | Syllables |  |  |
| Phrases |  |  |
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