

SIMPLIFYING THE STRMIX™ WORKFLOW WITH A CUSTOM SOFTWARE SOLUTION

Melanie Wagner

Indiana State Police Laboratory

There is currently a community-wide shift towards the use of continuous probabilistic modeling for forensic mixtures. Probabilistic genotyping is a powerful tool, and brings with it many benefits as well as challenges. The Indiana State Police Laboratory went online with ESR's STRmix™ software in late 2017. Several workflow shifts at the analysis stage were required, and documentation and review of each analysis quickly became daunting- especially as samples, comparisons, mixture deconvolutions, and likelihood ratio propositions multiplied within a case. For each run, STRmix™ outputs a PDF report that routinely contains dozens to hundreds of pages, depending on mixture complexity. Internal database search results are relegated to a completely separate folder from the rest of the sample output. Finally, depending on laboratory guidelines, STRmix™ may lack sufficient customization for isolating CODIS-eligible profiles (including partial or mixed loci).

"STRlite" is an Excel/VBA-based tool developed in-house to alleviate many of the workflow challenges we encountered. STRlite compiles the key information about each sample run, including: alleles analyzed, possible stutter peaks, number of contributors, mixture proportions, assumed contributor(s), deconvolution settings and diagnostics (which are automatically checked against laboratory defaults), allele variance, stutter variance, employee database search results, and appropriate likelihood ratios for multiple propositions, converted into reportable phrasing. There is also a Contributor Genotype Summary which doubles as a CODIS module- any locus whose possible genotype combinations meet certain criteria, including a chosen threshold for certainty (ISP uses 99%), will be listed as part of a contributor's "profile" and may be eligible for CODIS entry. All of this information is summarized in printable worksheets to include in the casefile. While all STRmix™ data are still preserved in electronic form, STRlite has greatly streamlined the analysis, report writing, and technical review steps by reducing reliance on STRmix™ reports and other output files.