The E3 Forensic Speech Science System (E3FS3): Design principles and validation of core software tools

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The E3 Forensic Speech Science System (E^3FS^3) is being developed in collaboration with multiple research and operational forensic laboratories. It is designed for conducting forensic-voice-comparison research and casework. When complete, E^3FS^3 will include open-code software tools, data-collection protocols, databases, standards and guidelines, standard operating procedures, a library of validation reports, and training for practitioners. The core software tools are based on state-of-the-art automatic-speaker-recognition technology, and are accompanied by detailed documentation explaining which algorithms were implemented and why they were chosen. For maximum transparency, the software is written in Python (a popular free high-level programming language) and the code is extensively commented. As each component of E^3FS^3 reaches the stage at which it is suitable for general release, it will be made available via http://E3FS3.forensic-voice-comparison.net/

This presentation describes the design principles for E^3FS^3, and reports on validations of an alpha version of the core software tools. The validations include a benchmark validation using the *forensic_eval_01* data that has previously been used to assess the performance of multiple other forensic-voice-comparison systems. They also include validations conducted under the conditions of the first case for which E^3FS^3 was used. This includes multiple recordings conditions, including multiple different questioned-speaker recording durations. Validations were conducted and reported in accordance with the “Consensus on validation of forensic voice comparison”.