



NIVaI

BSI Comissioned Project

Introduction

NIST Validator (NIVaI) is a project funded by Germany's Federal Office for Information Security (Bundesamt für Sicherheit in der Informationstechnik: BSI). **The goal of the project is to build a software solution that validates biometric files by checking whether they are structured correctly,** according to the specifications from the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) and the European Union (EU).

The project was awarded to IDloop in 2024 and is being performed entirely in-house. NIVaI is a three-year project that includes one year of software development and two years of maintenance and technical support.

Background

The **Entry/Exit System (EES)** is an automated IT system designed for registering non-EU citizens when they cross the border of an EU country. In this way, visitors to the EU that are planning on short stays will be automatically recorded by the system. The EES will modernize the EU's external border management and gradually improve traveler experience. It will also identify travelers who have overstayed in the EU by collecting data on entries and exits. And finally, through EES implementation, the EU will increase border security by collecting biometric data¹.

Collecting biometric data is an EES feature that brings the challenge of synchronizing data from many sources. As part of the border control process, biometric data (fingerprints and facial images) must be recorded and checked. However, biometric data entering the EU is encoded by national client systems in the EES-NIST and the Visa Information System-NIST (VIS-NIST) formats that are based on NIST specifications and modified by the EU. When the data is transmitted by EU member states to EU systems, the data must be initially generated according to specific requirements of the EES and VIS to ensure compatibility with EU systems and compliance with EU regulations.

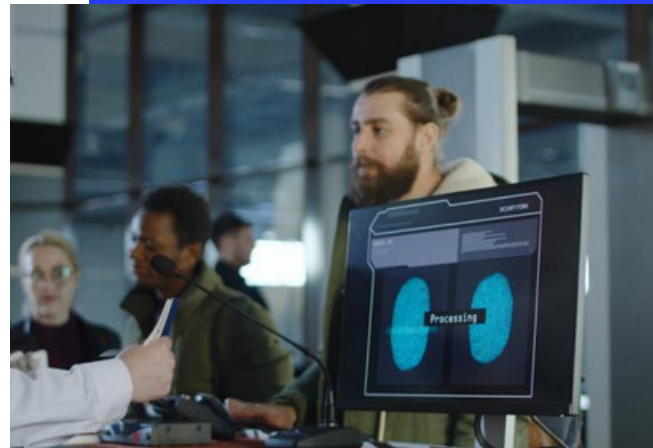


Image from <https://travel-europe.europa.eu/ees>

[1] European Union: Entry/Exit System (EES), https://travel-europe.europa.eu/ees_en



Therefore, the software solution requires the ability to check EES- and VIS-specific NIST biometric data to evaluate and conclude whether they are correctly structured by the various national client systems.

Software Solution

The NIVAL project resulted in the development of a software solution that can validate NIST files according to the NIST requirements and European specifications. The solution, the NIST validator, **is a standalone software composed entirely of open-source components**, allowing for easy integration with other systems, as well as flexibility for any potential future publication or distribution by the BSI. **The NIST validator contains tools to generate, view, edit and validate ANSI/NIST-ITL files.** An ANSI/NIST-ITL file is a standard format from the American National Standards Institute (ANSI) and NIST that is used to exchange fingerprint and other image data². The tool focuses on the EES-NIST and VIS-NIST files and on the record types that contain metadata, transaction information, as well as fingerprint, face and iris image data.

The software specifically (but not exclusively) **targets validating NIST files with the EES-NIST or VIS-NIST profile**. The three modules of the project are the validator itself (a python library for parsing, editing, validating, and writing NIST-ITL files), the command line interface (CLI) and the graphical user interface (GUI) modules for handling the files. **The validation tool is multi-platform, efficient, and easily extendable.** The CLI allows users to manage the validation process and to control the output according to their needs. The GUI makes the functionality of a checking module for EES-NIST and VIS-NIST files accessible to the user. It allows users to select files or directories containing files, check whether the files comply with the standards, and displays a summary of the results. The customizability of the GUI is a central feature that ensures the interface is flexible and easy to adapt to various requirements and user preferences.

[2] NIST: ANSI/NIST-ITL Standard. <https://www.nist.gov/programs-projects/ansinist-itl-standard>



Key Takeaways

The BSI has determined the necessity of a thorough examination of incoming biometric data during the EES test phase to ensure that they conform to the highest standards of structure. The completion of the NIVAL project provides the necessary software to validate EES-specific NIST data. This lightweight, flexible, open source and user-friendly software will also generate test files, view biometric files, and give the user the ability to edit incorrect fields. IDloop will continue to maintain NIVAL, providing service to the BSI and support for a smooth transition for the utilization of this tool. NIVAL software will help to fully assess biometric data from international travelers, assist in establishing identification, and support the national implementation according to EES regulations.



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