MODEL OF INFORMATION TECHNOLOGY FOR AUTOMATED HANDWRITING ANALYSIS

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Information technologies are part of modern processes in various areas. They help with automation, reliability, predictability and efficiency. Information technology for handwriting analysis helps to solve different problems in different areas, such as reduce subjectivity of conclusions in forensics [1], improve manual archival processing by automating the transcription and attribution of diverse historical manuscripts [2] and construct psychological portraits for assessment in psychology and personnel management [3].

The aim of the report is to present the developed model of information technology for automated handwriting analysis [4] that performs both writer identification and psychological profiling based on provided image samples.

The report reveals results of functional model creation and following mathematical formalization in the form of a tuple of sets and transformation functions. A general scheme is provided, showing general parts and functions such as handling of user data input, storage, processing and results. A detailed functional decomposition was done, highlighting stages such as user authentication, storage with watermarking, authorship determination, character trait identification and report generation. Additionally, attention was paid to the reliability and security of the system by the implementation of stenographic protection methods and using secure file storage and authentication.

The results of this report can be used to minimize the human factor in forensic examinations and provide real-time psychological feedback in a human resource environment. Further research and development involve expanding the technology by integrating multimodal biometric data processing, such as voice and dynamic facial parameters, to create a universal identity verification ecosystem.

References

1. Galekovic J., Tkalac Z., Ledic A. Forensic Examination of Handwriting and Documents. Forensic Science and Molecular Anthropology – *Topics Selected from 12th ISABS Conference on Forensic and Anthropological Genetics. IntechOpen*, Nov. 27, 2024. DOI: https://doi.org/10.5772/intechopen.115118

2. Tikhonov A., Rabus A. Handwritten Text Recognition of Ukrainian Manuscripts in the 21st Century: Possibilities, Challenges, and the Future of the First Generic AI-based Model. *Kyiv-Mohyla Humanities Journal*. 2024. (11). P. 226–247. DOI: https://doi.org/10.18523/2313-4895.11.2024.226-247

3. Deore S., Kalokhe P., Patil S., Nagarkar S. et al. Identifying the personality traits using handwriting recognition in a real-time environment. *Ingénierie des Systèmes d'Information*. 2025. Vol. 30, No. 1. P. 203–211. DOI: https://doi.org/10.18280/isi.300117

4. Shupyliuk M., Martovytskyi V., (2026). Model of information technology for automated handwriting analysis. *Scientific notes of Taurida National V.I. Vernadsky University. Series: Technical Sciences*. 2026. pp. 442–447. DOI: https://doi.org/10.32782/2663-5941/2026.1.2/55