OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: Iris Image Dataset Collections

Describe the need: Large datasets are required to support development and testing of scientific methods. Publicly available iris image datasets are small, limiting research in several key areas of interest.

Keyword(s): Iris Image, Physical Stability, Longitudinal, Pupil Dilation, Anomalies, Disease, Injury, Antemortem/Postmortem

Submitting subcommittee(s): Facial and Iris Identification **Date Approved:** 1/26/2024

(If SAC review identifies additional subcommittees, add them to the box above.)

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

Yes. This research need will address gaps for multiple planned standards including, but not limited to, Comparison List for ACE-V: Physical Stability of Features, Iris Anomalies, and Iris Recognition System Methods and Techniques.

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

Several entities have collected or are actively collecting iris images for a variety of research purposes. These datasets are small due to limitations including available population size and the inherent nature of the need (i.e, disease. These factors limit overall research outcomes. Additional datasets could be added to existing resources, increasing dependability of results.

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

Boyd, A., Yadav, S., Swearingen, T., Kuehlkamp, A., Trokielewicz, M., Benjamin, E., Maciejewicz, P., Chute, D., Ross, A., Flynn, P. and Bowyer, K. (2020). Post-mortem iris recognition—a survey and assessment of the state of the art. IEEE Access, 8, pp.136570-136593. [online], https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9146139

Das, P., Holsopple, L., Rissacher, D., Schuckers, M. and Schuckers, S. (2021). Iris recognition performance in children: A longitudinal study. IEEE Transactions on Biometrics, Behavior, and Identity Science, 3(1), pp.138-151, [online], https://arxiv.org/pdf/2101.06346.pdf

Grother, P., Matey, J. , Tabassi, E. , Quinn, G. and Chumakov, M. (2013), IREX VI - Temporal Stability of Iris Recognition Accuracy, NIST Interagency/Internal Report (NISTIR), National Institute of Standards and Technology, Gaithersburg, MD, [online], https://doi.org/10.6028/NIST.IR.7948

Matey, J., Quinn, G. and Grother, P. (2022), Forensic Iris: A Review, Technical Note (NIST TN), National Institute of Standards and Technology, Gaithersburg, MD, [online], https://doi.org/10.6028/NIST.TN.2226

President's Council of Advisors on Science and Technology. (2016), Forensic science in criminal courts: Ensuring scientific validity of feature-comparison methods, Technical Report, President's Council of Advisors on Science and Technology, [online], https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast forensic science report final.pdf

Trokielewicz, M., Czajka, A. and Maciejewicz, P. (2017), Implications of ocular pathologies for iris recognition reliability. Image and Vision Computing, 58, pp.158-167. [online], https://arxiv.org/pdf/1809.00168.pdf

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest? Is your research need identified by NIJ?

No.

5. In what ways would the research results improve current laboratory capabilities?

Iris image dataset collections will allow more in-depth research supporting the scientific validity of iris recognition, including the efficacy and accuracy of both algorithms and image examiners.

6. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

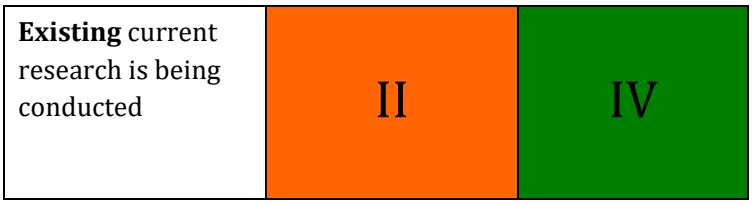
This research would validate or refute current scientific data available, allowing for appropriate revisions, as well as providing much needed reference documentation.

7. In what ways would the research results improve services to the criminal justice system?

This research would increase accuracy, objectivity, and validity to the field of iris recognition.

8. Status assessment (I, II, III, or IV): I

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III



This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.