



Best Educational Effort – Winner

Face Recognition Vendor Test Program

National Institute of Standards and Technology

Patrick Grother, Mei Ngan, and Kayee Hanaoka manage the NIST Face Recognition Vendor Test (FRVT) program, the largest and most extensive face recognition algorithm test of its kind. FRVT is a globally recognized program that has provided expansive, ongoing, and invaluable results and analysis to the facial recognition community, including developers, end users, and policy- and decisionmakers. FRVT results have been the “gold standard” for the facial recognition community worldwide, providing an independent assessment on the current capabilities and limitations of submitted face recognition algorithms.

The FRVT program was developed to evaluate face algorithm capabilities on a fair, repeatable, and equitable platform with data, software, and analysis controlled by a trusted third party. FRVT has evaluated face recognition performance for one-to-one verification, one-to-N identification, ranked-based investigation, demographic differentials, twins and siblings, morphing, image quality, and the impact of face masks on pre-face mask-developed algorithms. In assessing the performance of such areas of research, FRVT has evaluated well over 600 algorithms from more than 150 worldwide developers. FRVT has unique access to over 30 million operational images from a number of different data sources that provide a variety of quality, ranging from portrait-quality images to unconstrained image capture.

The FRVT team has published reports covering all its work and made them available on the NIST FRVT website (<https://www.nist.gov/programs-projects/face-recognition-vendor-test-frvt>). The reports are continuously updated as new algorithms, data, and analysis become available. In addition to published reports, the FRVT team has given a number of seminars internationally to educate audiences on the ever-changing topic of face recognition. The team has given over 30 invited talks/presentations at worldwide conferences and workshops; responded to over 30 media interview requests; responded to approximately 15 U.S. congressional and Government Accounting Office inquiries; and prepared NIST leadership for four U.S. congressional testimonies related to their work. Invited talks at industry and government venues include Biometrics Institute Congress (London), Biometrics Institute – Asia-Pacific Conference (Australia), Bias Estimation in Face Analytic Workshop, Biometrics Special Interest Group (Germany), Innocence Project, Privacy and Civil Liberties Oversight Board, and Washington State House Working Groups (United States), to name a few.

The FRVT team members have been and continue to be active members in a number of USG collaborations and working groups. NIST’s evaluations assist other agencies’ face recognition research and development efforts. The team’s established partnerships include Intelligence Advanced Research Projects Activity, (FB), DHS Science and Technology Directorate (S&T), OBIM, and CBP, and it is a key member of the Special Operation Command Next Generation Identification and Awareness Government Biometric Technical Working Group.



The results of the FRVT evaluation have highlighted a wide range of performance across algorithm developers and data types. It has informed end users of the technology so they are aware of the algorithm they are using and understand performance variations that exist based on their system’s algorithm, quality of the data, specific application, and risk levels unique to their use case.

The team has also contributed to international face image quality biometric standards, including scalar/vector-quality metrics and next-generation face image capture standards. These standards will have significant impacts on improving the quality of data presented to face recognition systems and will improve identification performance.

This quote from International Biometric Identity Association summarizes the value of FRVT: “The recent NIST report on the performance of facial recognition algorithms across different demographics is a game-changer. It provides new and comprehensive data on the performance of algorithms across demographic groups. ... With facts and evidence, the NIST report informs the policy debate on facial recognition, making possible an open and transparent process with a careful balancing of benefits and appropriate uses....”