# Manual for the PUF performance evaluation program using the biometric approach

Version 1.0

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**National Institute of Advanced Industrial Science and Technology (AIST)**
**Research Center for Information Security (RCIS)**

# 1. Introduction

This document is a user manual for the PUF performance evaluation program (released by RCIS, AIST). The program is based on the following paper.

H. Kang, Y. Hori, T. Katashita, A. Satoh, "Performance Evaluation for PUF-based Authentication Systems with Shift Post-processing: Additional Experimental Results," The 2011 Symposium on Cryptography and Information Security (SCIS2011), Kitakyushu, Japan, Jan. 25-28, 2011.

You can download the program from the following website.

http://staff.aist.go.jp/akashi.satoh/SASEBO/ja/puf/index.html

The following table provides details about the MATLAB files.

| MATLAB file | Description |
| --- | --- |
| ¥preparation¥making_3d_data_1.m | Prepares three-dimensional arrays from the PUF responses (gathered by using SASEBO-GII) |
| ¥preparation¥making_50_20_data_2.m | Selects data with 20 testing iterations and 50 IDs from the response dataset (for simple testing) |
| ¥reliability¥puf_eval_gen.m | Calculates the SC (Same Challenge) Intra-PUF |
| ¥reliability¥puf_eval_imp.m | Calculates the DC (Different Challenge) Intra-PUF |
| ¥reliability¥match_id.m ¥security¥match_id.m | Calculates the Hamming distance by using two responses |
| ¥reliability¥function_cal_far_frr.m | Shows the resulting graph with EER (Equal Error Rate) prepared by using SC Intra-PUF and DC Intra-PUF |
| ¥security¥sc_inter_a_pufs.m | Calculates the SC Inter-PUF |
| ¥security¥dc_inter_a_pufs.m | Calculates the DC Inter-PUF |
| ¥security¥function_cal_far_frr_SC_SC.m | Show the resulting graph with EER by prepared by using SC Intra-PUF and SC Inter-PUF (There is no need to consider DC Inter-PUF) |

## 2. Program operation instructions

1) Download the program and the dataset from the URL provided above.

2) Decompress the downloaded archive.

3) Refer to the above table of descriptions and the figures provided on the website when working with the MATLAB files.

[Technical support]

National Institute of Advanced Industrial Science and Technology (AIST)

Research Center for Information Security (RCIS)

Central 2, 1-1-1 Umezono, Tsukuba, Ibaraki 305-8568, Japan

Tel:　+81-(0)29-861-5284　　Fax:　+81-(0)29-861-5285