**SUTD 51.508: Secure Cyber Physical Systems (2019)**

**Week 9&10 assignment**

26 March 2019

* Submit your solution/report to eDimension by **Fri April 12, 6:59 PM**.
* Each group only needs one submission.
* List your names (max 3 members for each group) on the submission, **if you have actually worked on the assignment**.

1. Perform the following exercise on iTrust training skid using Studio 5000 and IDLE separately:

**Attack**

* The button DO\_10 is supposed to stay lit at all times. Perform an attack to switch off the light of the button DO\_10.

**Defence**

* If the button DO\_10 is switched off, display an alert to the administrator.

1. Perform the following exercise on iTrust training skid using Studio 5000 and IDLE separately:

**Attack**

* The button DO\_10 is supposed to light up if the temperature rises above the threshold temperature of 30 degrees Celsius. Perform an attack to alter the threshold temperature to a different value (e.g. 40 degrees Celsius).

**Defence**

* If the threshold temperature is suspiciously different, display an alert to the administrator.

1. Use pycomm code to launch an attack on MV201, P301, LIT301, LIT401 in SWaT, respectively, **with the permission of instructor**. Check the response on the invariant-based monitor and report to the instructor.

For the above three questions, please include photographs/videos and screenshots of your complete program in your assignment report.

1. Dataset and system model for SWaT (Stage 1) are provided. Skeleton code is provided in python (but you are free to use any programming language). Implement the iterative equations for an estimator and find out the residual. Use mean, variance and mean average deviation of the resultant residual vector for FIT-101 and LIT-101 for a chunk size of 100 to do a 3D scatter plot and see if both sensors could be uniquely identified.