HAI 22.04

HAI 22.04 includes six CSV files as training datasets and four CSV files as testing datasets. The time-

series data in each CSV file satisfies time continuity and includes 89 columns. The first column represents the observed time in the "yyyy-MM-dd hh:mm:ss" format, while the next 87 columns provide

the recorded SCADA data points. The last four columns provide data labels for the presence or absence of an attack. Out of these columns, the attack column is applicable to all processes and the other three columns are applicable to the corresponding control processes.

NORMAL OPERATION

We used a hidden Markov model (HMM) to model the normal operation of SCADA. The HMM probabilistically determines the sequence and the delivery time of set point commands from a set of seven set points. The probabilistic parameters of all the HMMs are the same as HAI 23.05.

ATTACK OPERATION

The 58 attacks were conducted, including 32 attack primitives and 26 combinations of attacks designed to simultaneously perform two attack primitives. The attack scenarios are given below.

Attack

Duration

No

ID

Start Time

Scenario

Target Controller

Target Point(s)

(sec)

1

A101

AP04

P1-PC-CO1

P1_PCV01D

5:41

190

2

A102

AP18

P1-LC-CO1-ST

P1_LCV01D

7:19

54

3

A103

AP11

P1-FC-CO1PV1

P1_FCV03D, FT03

11:25

126

Jul. 10,

4

A104

AP37

P3-LC-CO2

P3_LCV01D

15:39

54

2021

5

A105

AP14

P1-LC-SP1

P1_B3004

16:42

296

6

A106

AP13

P1-CC-CO1

P1_PP04

19:21

91

7

A107

AP19

P1-TC-CO1

P1_FCV01D

22:35

67

8

A201

AP01

P1-PC-SP1

P1_B2016

16:38

257

9

A202

AP13

P1-FC-CO1-ST

P1_FCV03D

17:21

65

10

A203

AP31

P2-SC-SP1-ST

P2_AutoSD

18:13

45

AP04

P1-PC-CO1

P1_PCV01D

11

A204

Jul. 13,

20:28

248

AP29

P2-SC-CO1

P2_SCO

2021

12

A205

AP37

P3-LC-CO2

P3_LCV01D

21:10

55

AP02

P1-PC-SP1PV1

P1_B2016,P1_

13

A206

21:58

176

AP27

P2-SC-SP1PV1

P2_AutoSD, P2_SIT01

14

A207

AP16

P1-LC-CO1

P1_LCV01D

23:40

284

15

A208

AP30

P2-SC-CO1PV1

P2_SCO, P2_SIT01

1:15

152

16

A209

AP03

P1-PC-SP1PV1PV2

P1_B2016, PIT01, P1_FIT01

Jul. 14,

1:40

162

17

A210

AP26

P2-SC-SP1

P2_AutoSD

2021

3:23

97

18

A211

AP05

P1-PC-CO1PV1

P1_PCV01D, P1_PIT01

7:21

151

33