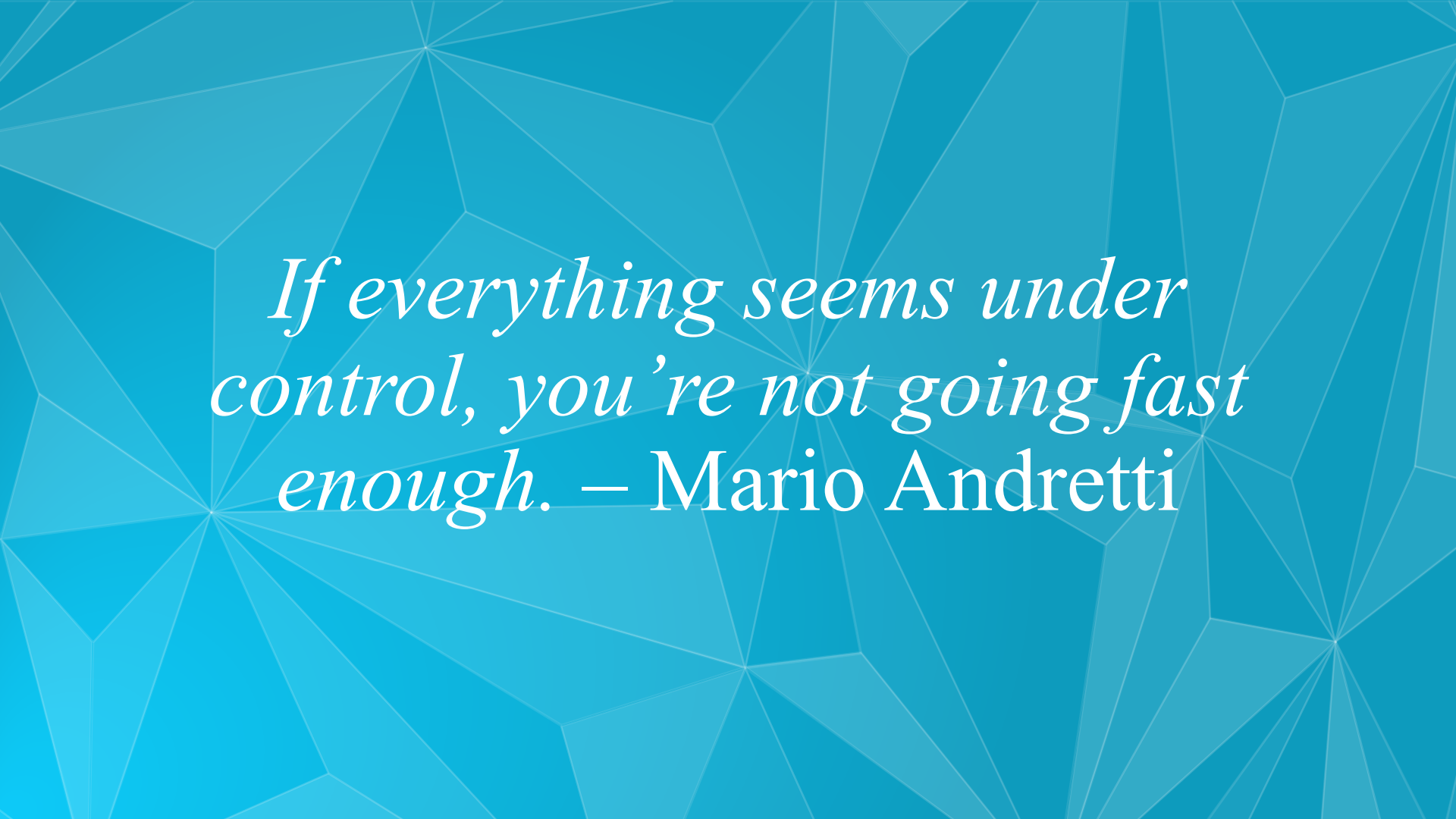




NUS DATA SCIENCE COMPETITION 2018

Team Terra-rist (24)



*If everything seems under
control, you're not going fast
enough. – Mario Andretti*

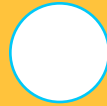
Today's Agenda

Richard & James



Question 1

Kaustubh & Hwee Young



Question 2



Q&A

Maps

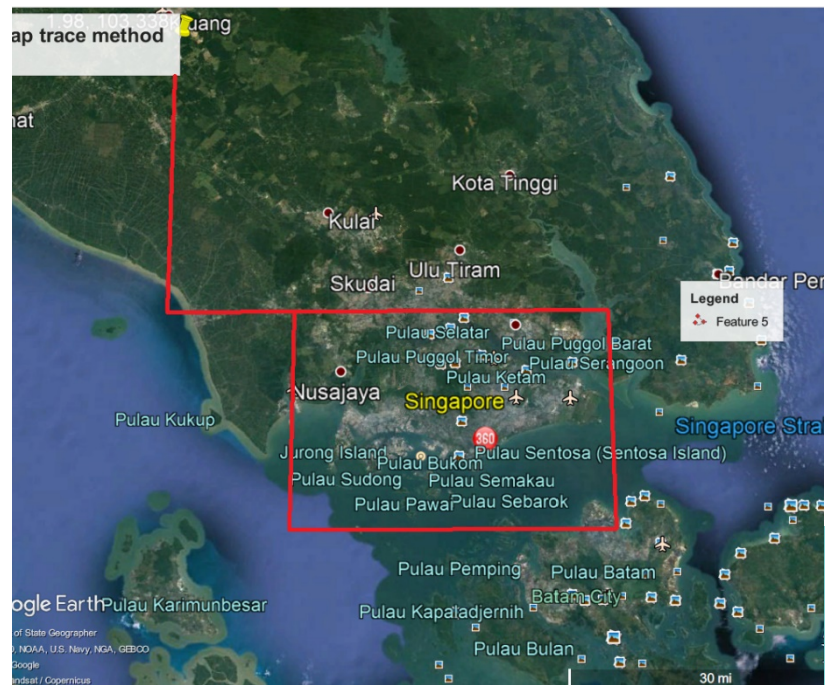
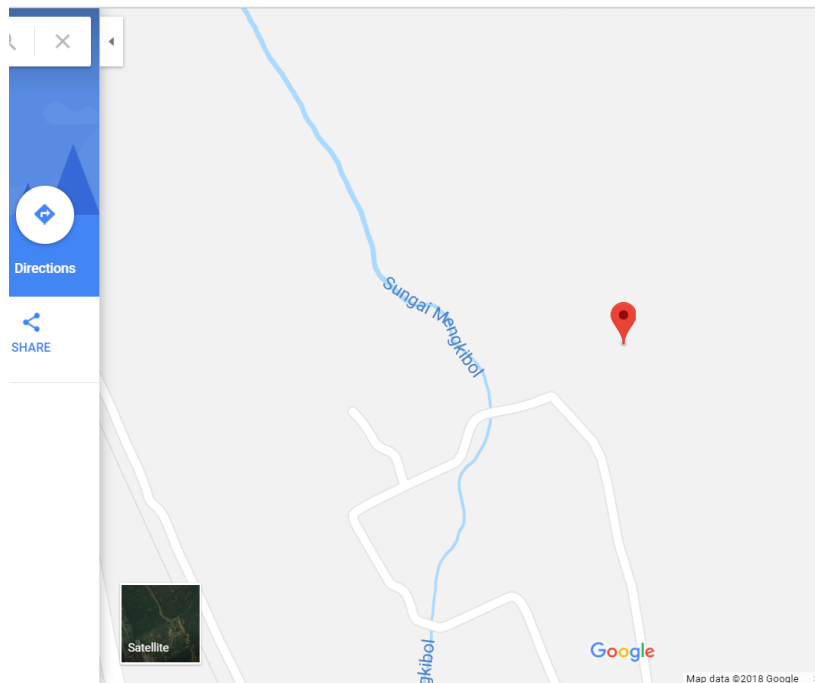


Table 2, and the details of their instruments and starting operational dates are given in Table 3. A more detailed listing of the instruments can be found in the Annex 1.

ID	Station	Position		Elevation above mean sea-level (m)
		Lat. (N)	Long. (E)	
24	Changi Climate Station	1.3678	103.9826	15
06	Paya Lebar Meteorological Station	1.3524	103.9007	34
23	Tengah Meteorological Station	1.3858	103.7114	17
25	Seletar Meteorological Station	1.4166	103.8654	17
80	Sembawang Meteorological Station	1.4252	103.8202	26

Table 2: Locations of the manned stations

ID	Station	Hellmann Rain Gauge	Thermometer	Hygrometer	Barometer	Sunshine Recorder	Soil Thermometer	Evaporation Tank	Operational Date
24	Changi Climate Station	1	1	1	1	1	1	1	01/01/1972
06	Paya Lebar Meteorological Station	1	1	1	1				01/08/1955
23	Tengah Meteorological Station	1	1	1	1				01/01/1950
25	Seletar Meteorological Station	1	1	1	1				01/04/1970
80	Sembawang Meteorological Station	1	1	1	1				01/04/1986

Table 3: Types and numbers of instruments at the manned stations

3.3 Automatic Weather Stations

Finding the weather stations

Hardest part of the competition

$$R_{\text{radar}}(x, y) = \sum A e B k c k (x, y) \Delta t \text{ --Equation 1}$$

lat	long	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
198	174	7	5	11	9	4	13	9	4	4	3	3	1	5	2	2	0
198	174	5	3	6	3	4	2	2	1	4	1	8	2	2	1	1	1
198	174	2	0	6	6	3	12	5	1	7	10	8	9	8	7	4	1
198	174	6	8	9	6	4	4	1	2	6	6	5	3	3	7	2	1
198	174	4	2	1	2	6	5	2	3	4	4	1	0	0	2	2	0

	A	B	C	D	
	Year	Week	X0	X1	X
2	2017	13	36.8	30	
3	2017	15	43.8	90.4	
4	2017	16	98.8	134	
5	2017	17	100.2	56	
6	2017	18	2	76	
7	2017	19	9.2	28.4	
8	2017	20	84.8	15.8	
9	2017	21	43.4	103	
0	2017	22	109.2	59.4	
1	2017	23	0	29.8	
2	2017	24	16	111.8	
3	2017	26	8.2	13.8	
4	2017	28	74.2	77.2	
5	2017	29	0	0.6	
6	2017	31	2.6	4.4	
7	2017	32	10	89.8	
8	2017	33	89	139.8	
9	2017	35	4.8	1.2	
0	2017	36	37.2	129	
1	2017	37	36.8	77.8	4
2	2017	38	67.8	45.6	4
3	2017	39	22.2	54.6	
4	2017	41	88.6	102.6	
5	2017	44	10.4	38	
6	2017	45	151	45.4	

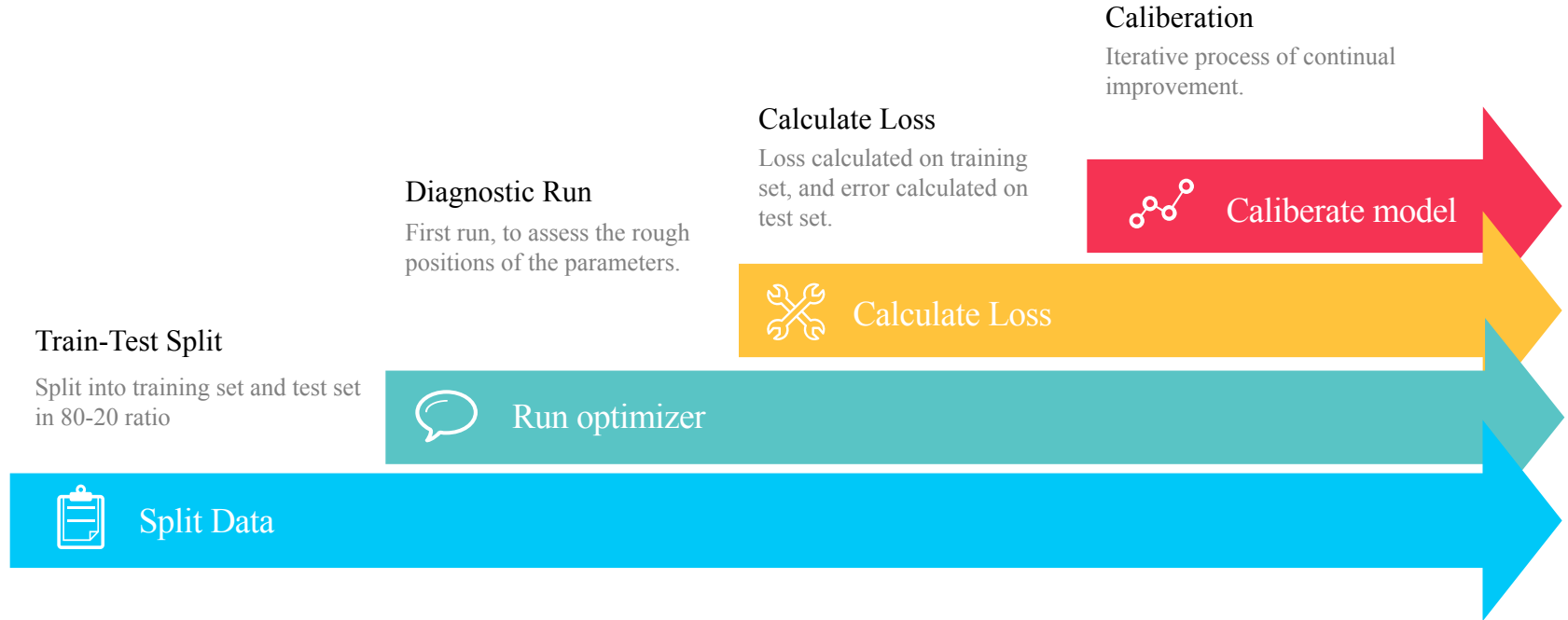
```
>>> sum(maxes)/len(maxes)
```

```
0.71482539094149
```

```
>>>
```

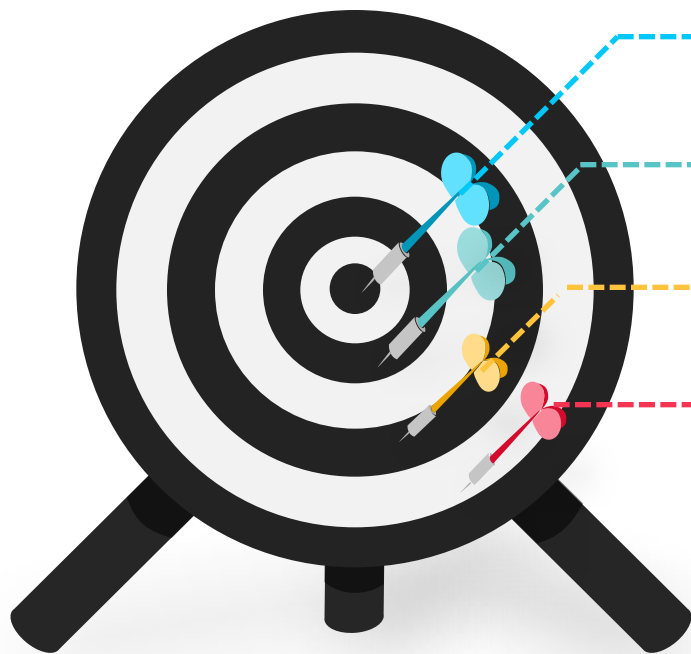
Particle Swarm Optimization

Minimizing the Loss Function



Findings

Basic target



A 1.936

B 0.317

E 0.825

Loss 720.9 (MSE)

$$\sum_k A e^{Bk} c_k(x, y) \Delta t + E$$

Decision Tree,

A random forest approach



MEAN AND MEDIAN