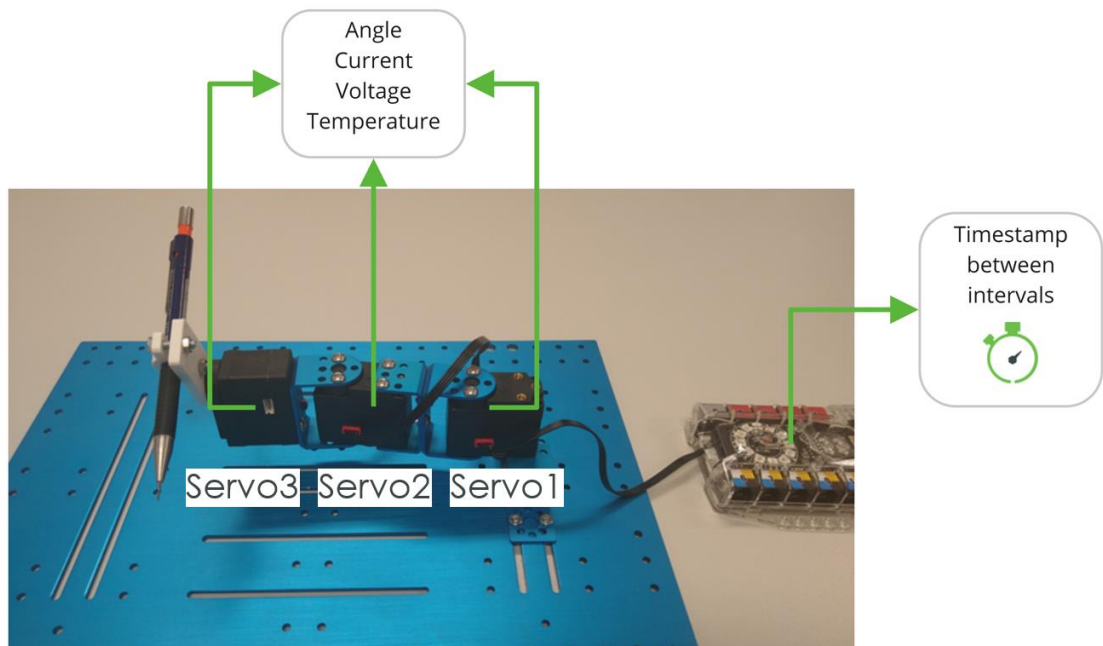


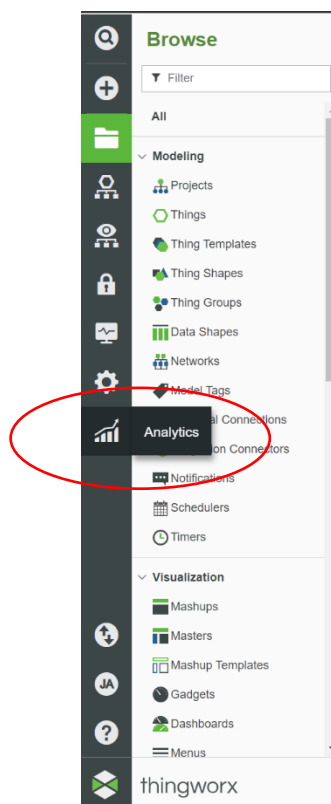
## Create an Analytics model and use it with a Thing

### 1. Demonstrator

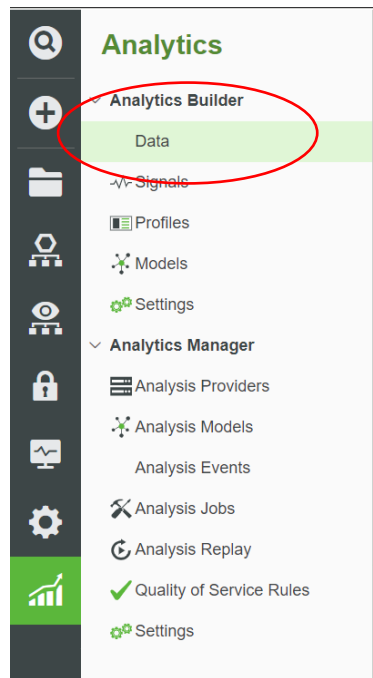


a. Dataset: ML\_demo\_dataset.csv

### 2. Navigate to Analytics on the menu bar on the left side of composer:



### 3. Select Data



#### 4. Create New dataset

- a. Name: INITIALS\_esrap\_demo
- b. Choose File -> navigate to the ML\_demo\_dataset.csv file on your PC
- c. Uncheck the boxes (see screenshot below)
- d. Submit

A screenshot of the 'New Dataset' form in the PTC Analytics application. The form has a title bar 'New Dataset'. Below it, there's a 'Dataset Name (required):' field with the value 'INITIALS\_esrap\_demo'. Under 'File Containing Dataset Data (CSV format):', there's a 'Choose File' button and the file 'ML\_demo\_dataset.csv' is listed. There are two checkboxes: 'Upload metadata' (unchecked) and 'Time series data' (unchecked). To the right is a large 'Status Messages' area. At the bottom are 'Submit' and 'Cancel' buttons.

#### 5. Add Metadata information

- a. Op Type:
  - i. Asset = Informational
  - ii. Everything else Continuous
- b. Data Type:
  - i. Asset = String
  - ii. Voltage values = Double
  - iii. All other values = Integer
- c. Download As JSON (If you want to recreate the dataset, you do not have to supply the Metadata information manually. You can use the JSON as source)

- d. Compare with the image below
- e. Create Dataset

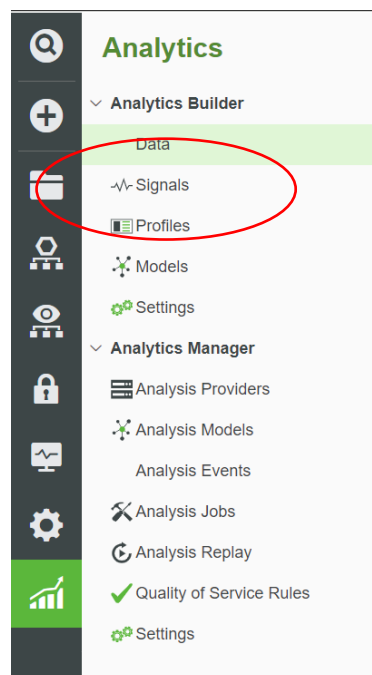
Review Metadata

Field Name	Op Type	Data Type	Min	Max	Values
asset	Informational	String			
smartServo3Angle	Continuous	Integer			
smartServo1Angle	Continuous	Integer			
smartServo1Current	Continuous	Integer			
smartServo1Voltage	Continuous	Double			
smartServo2Angle	Continuous	Integer			
smartServo2Temp	Continuous	Integer			
smartServo2Current	Continuous	Integer			
smartServo2Voltage	Continuous	Double			
smartServo3Angle	Continuous	Integer			
smartServo3Temp	Continuous	Integer			
smartServo3Current	Continuous	Integer			
smartServo3Voltage	Continuous	Double			

Status Messages

Restore Defaults Download As JSON Create Dataset Cancel

6. Navigate to Signals
  - a. Create a new signal



7. Enter Signal settings
  - a. Name: INITIALS\_esrap\_demo\_signal
  - b. Dataset: Select your previously created Dataset
  - c. Goal: Select SmartServo3Angle
  - d. Filter: all\_data
  - e. -> Submit

### New Signals

**Signal Name (required)**

☐ Redundancy Filter

**Excluded Fields from Signal:**

**Data from Existing Dataset**

**Dataset (required):**

**Goal (required):**

**Filter (required):**

-- OR --

## 8. Review Signal results

- On the left side you can see the Feature Name and how much information it provides for the value of SmartServo3Angle (from 0 to 1), 0 means no mutual information

**Signals** 0 Field(s) Filtered, joined by: And Add Filter

Page 1 of 1

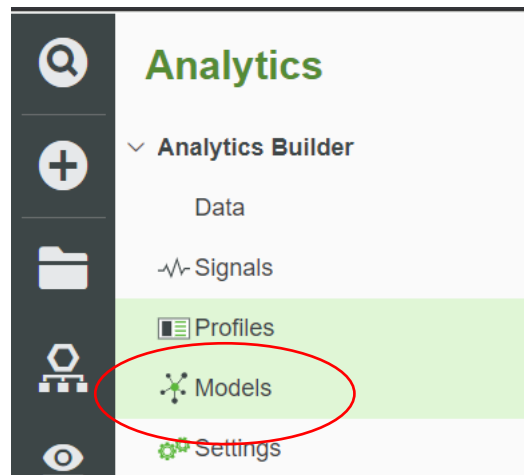
Signal Name	State	Dataset	Filter	Goal	Job Id	Start Time
INITIALS_esrap_demo_signal	COMPLETED	initials_esrap_demo	all_data	smartServo3Angle	478c3d52-7b5a-46b3-b363-652da9062371	May 21, 2021 5:32 PM
JA_ESRAP_demo_signal	COMPLETED	ja_esrap_demo	all_data	smartServo3Angle	5e9763d6-1e1f-4d88-a08f-8b4b87760006	May 21, 2021 1:37 PM
Example	COMPLETED	demonstrator_dataset	all_data	isBroken	b0631dec-00da-4ba2-8c5-37d6f055f70	May 17, 2021 11:58 AM

INITIALS\_esrap\_demo\_signal
  initials\_esrap\_demo
  smartServo3Angle
  all\_data
  100%
  114.8571
  140
  No Exclusions Applied

Feature Name	Mutual Information	Information Gain
smartServo1Voltage	0.76	
smartServo1Current	0.69	
smartServo1Angle	0.69	
smartServo3Voltage	0.65	
smartServo2Voltage	0.64	
smartServo1Temp	0.25	
smartServo2Temp	0.24	
smartServo3Temp	0.24	
smartServo2Angle	0.00	
smartServo2Current	0.00	
smartServo3Current	0.00	

Values	Avg. Goal	Diff vs Avg	% Diff vs Avg	# of records
--------	-----------	-------------	---------------	--------------

## 9. Navigate to Models



## 10. Create new Model

- Name: INITIALS\_ESRAP\_DEMO
- Dataset: name of the previously created dataset
- Goal: smartServo3Angle
- Exclude Fields (right side of the window)
  - smartServo3Current
  - smartServo3Temp
  - smartServo3Voltage
- Submit

**New Predictive Model**

Model Name (required):  Model Description:

**Data Selection** | Advanced Model Configuration

Dataset (required):

Goal (required):

Filter (required):  Create Filter

**Filter Details**

This filter contains 140 rows, representing 100% of all the rows in the dataset

This filter uses all the rows in this dataset.

**Excluded Fields from Model:** Exclude Fields

smartServo3Current

smartServo3Temp

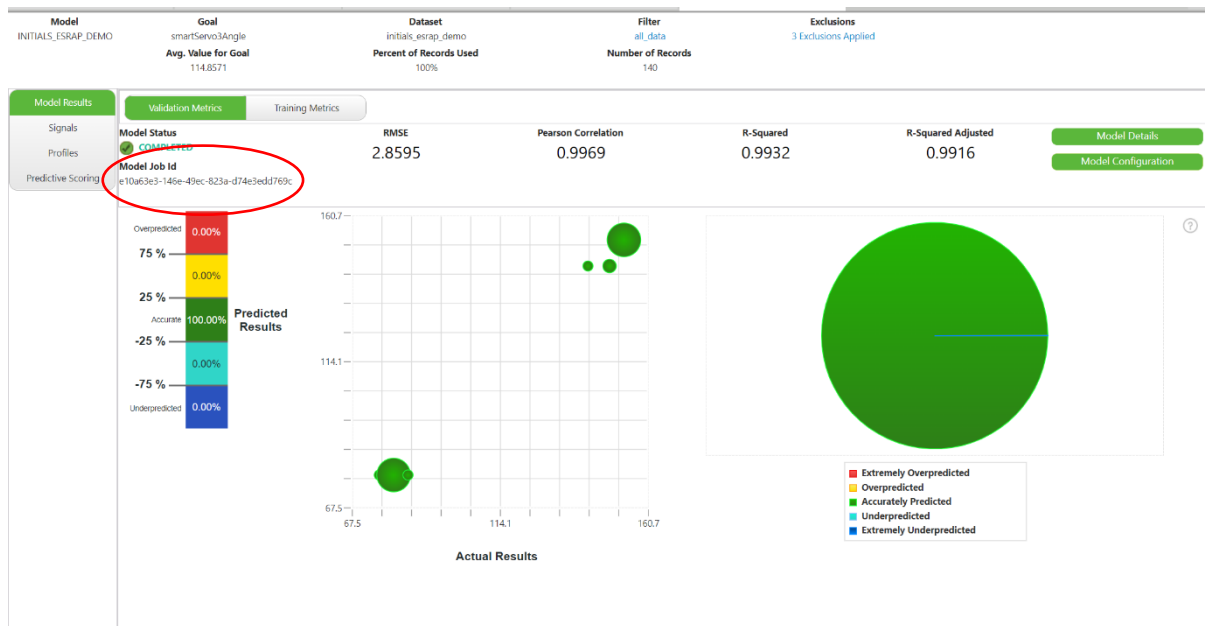
smartServo3Voltage

Submit Cancel

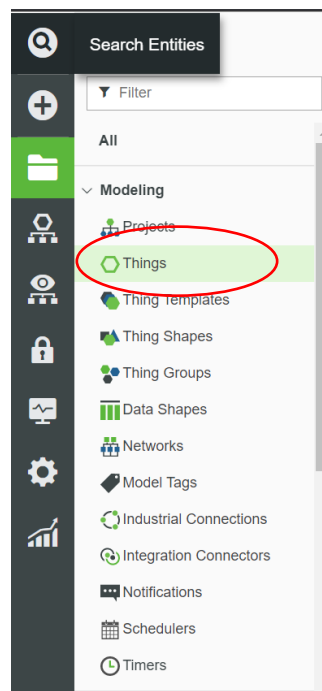
## 11. Wait until model state changes to Completed

## 12. Double click on created model

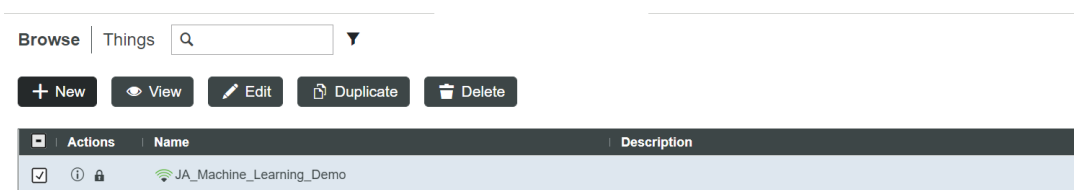
- Copy Model Job Id



### 13. Navigate to Browse -> Things



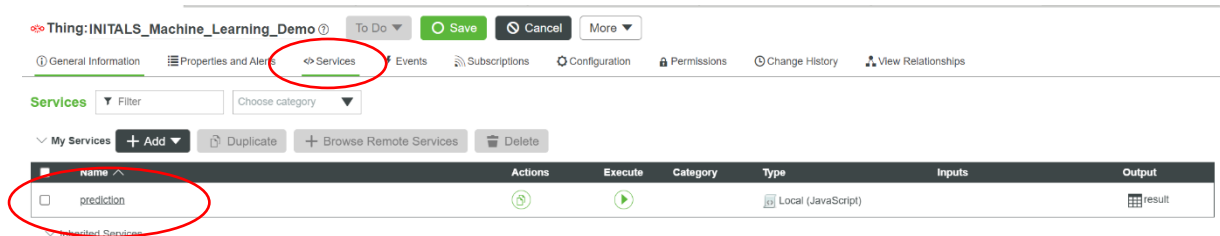
### 14. Select JA\_Machine\_Learning\_Demo and duplicate it



15. Enter details:

- Name: INITIALS\_Machine\_Learning\_Demo
- Project: ESRAP\_2021\_05\_24
- Save

16. Navigate to Services and edit the prediction service:



17. On line 41 change the model URI to "results:/models/your URI here"

