

# Home Assistant & Machine Learning



# AGENDA



- Use case
- Data Home Assistant
- Model trainen



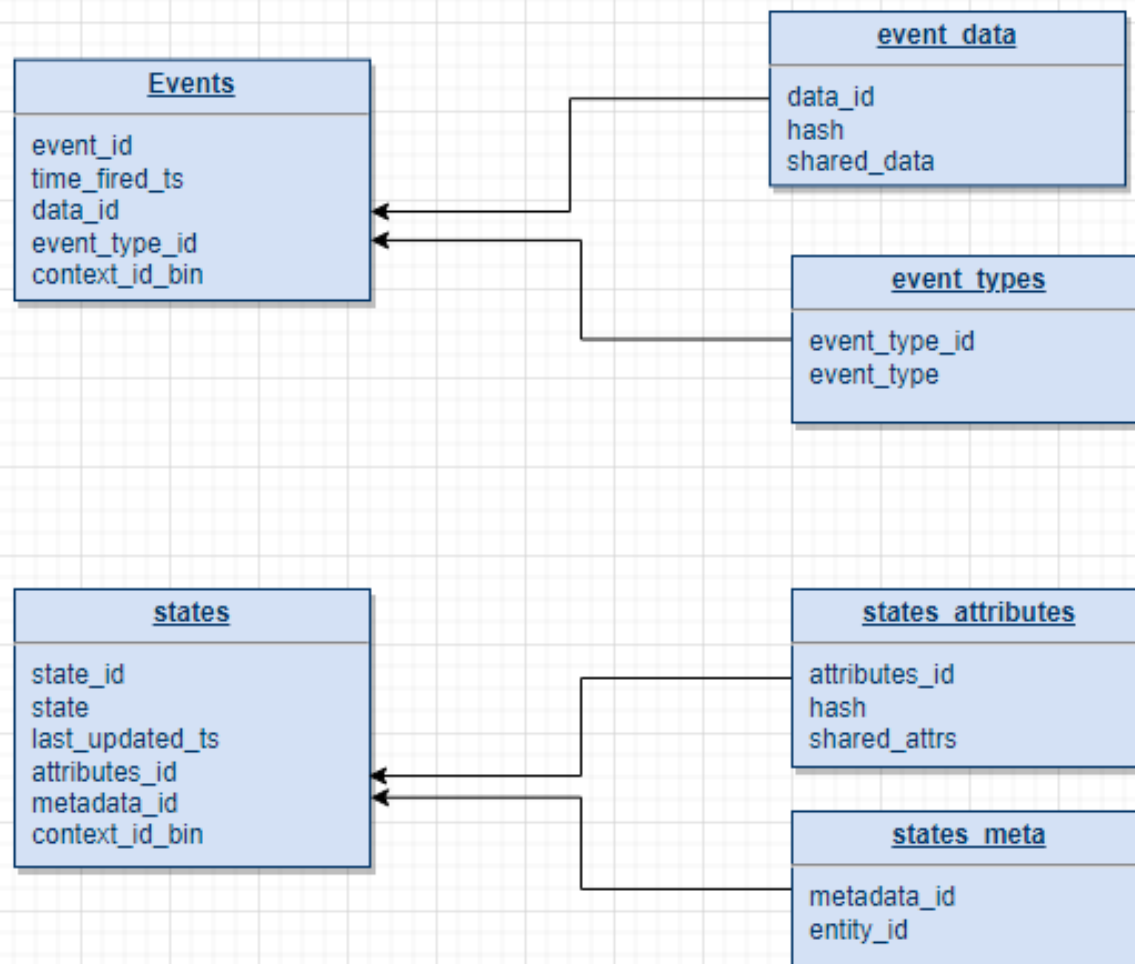
Use case

Thermostaat  
automatiseren





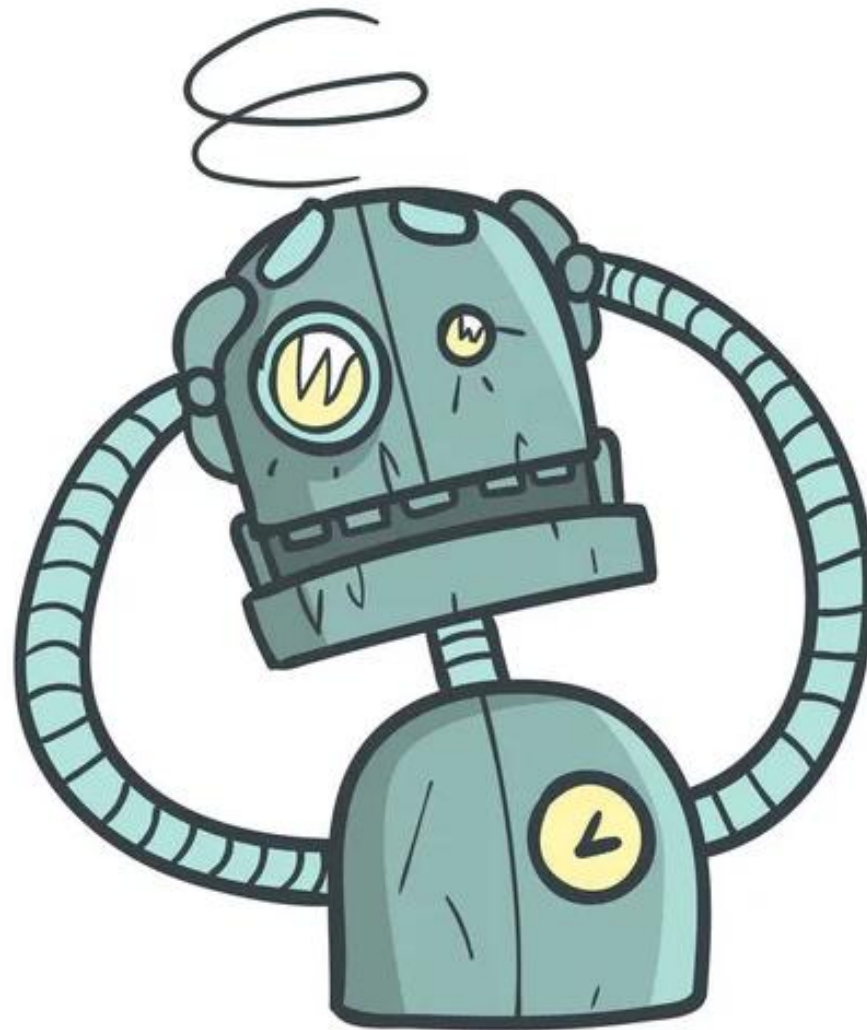
Data



# Hoe gebruiken we de data

- Trigger ->veranderen van state
  - Buiten/binnen temperatuur
  - Aanwezigheid person
  - Tijd van de dag
- Condition -> huidige state
  - Buiten/binnen temperatuur
  - Aanwezigheid person
  - Tijd van de dag
- Action -> event
  - Aanpassen van Toon

Model  
trainen



# Thermostaat vs. Lamp aan/uit



```
[39]: # Bereken precision
precision = precision_score(y_test, rf_predictions, average='macro', zero_division=1)
print("Precision:", precision)

# Bereken recall
recall = recall_score(y_test, rf_predictions, average='macro', zero_division=1)
print("Recall:", recall)

# Bereken F1-score
f1 = f1_score(y_test, rf_predictions, average='macro')
print("F1-score:", f1)

print("RF:", rf_accuracy)
print("DT:", dt_accuracy)
```

```
Precision: 0.5040320211515863
Recall: 0.16261967846419947
F1-score: 0.09242183165246907
RF: 0.9780937740199847
DT: 0.9777094542659492
```

```
[18]: # Bereken precision
precision = precision_score(y_test, rf_predictions, average='macro', zero_division=1)
print("Precision:", precision)

# Bereken recall
recall = recall_score(y_test, rf_predictions, average='macro', zero_division=1)
print("Recall:", recall)

# Bereken F1-score
f1 = f1_score(y_test, rf_predictions, average='macro')
print("F1-score:", f1)

print("RF:", rf_accuracy)
print("DT:", dt_accuracy)
```

```
Precision: 0.8810304616606748
Recall: 0.8146800617806023
F1-score: 0.8434107173860133
RF: 0.937246963562753
DT: 0.9378423434150989
```

## Uitdagingen

- Hardware
- Data
- Open source

```
dt_model = DecisionTreeClassifier(random_state=best_random_state)
rf_model = RandomForestClassifier(n_estimators=best_n_estimators, random_state=best_random_state, n_jobs=-1)

dt_model.fit(x_train, y_train)
rf_model.fit(x_train, y_train)

dt_predictions = dt_model.predict(x_test)
rf_predictions = rf_model.predict(x_test)

dt_accuracy = accuracy_score(y_test, dt_predictions)
rf_accuracy = accuracy_score(y_test, rf_predictions)

print("Beste random_state:", best_random_state)
print("Beste n_estimators:", best_n_estimators)
print("Beste score rs:", best_score_rs)
print("Beste score ne:", best_score_ne)
print("Score van het definitieve rf_model:", rf_accuracy)
print("Score van het definitieve dt_model:", dt_accuracy)
```

### Kernel Restarting

The kernel for Thermostat model/lights\_it3ipynb appears to have died. It will restart automatically.

Ok

```
[ ]: # Bereken precision
precision = precision_score(y_test, rf_predictions, average='macro')
print("Precision:", precision)

# Bereken recall
recall = recall_score(y_test, rf_predictions, average='macro', zero_division=1)
print("Recall:", recall)

# Bereken F1-score
f1 = f1_score(y_test, rf_predictions, average='macro')
print("F1-score:", f1)

print("RF:", rf_accuracy)
print("DT:", dt_accuracy)
```

# WARNING



# CHALLENGES AHEAD



# Wat nu?

- Algorithmen?
- Custom Sensoren?
- Chat GPT?

**Trigger:** temperatuur binnen < favoriete temperatuur op dit tijdstip

**Condition:** Persoon in groep = home, max buiten temp < hoogst geregistreeerde temp, Niemand slaapt

**event:** Zet thermostaat aan op favoriete temp

