Applied Data Science:

Smart Building

DE HAAGSE HOGESCHOOL

Inhoudsopgave:

- Milestones
- Gesprek
- Proces
- Rule Based System
- Deep Learning
- Bayesian Belief Network
- Planning

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Milestones:

Vooronderzoek

<u>Fase 1: Detecteren van defecten</u>

Kibana en Power BI: test dataset te klein

Fase 2: ML methodes testen

Fase 3: Automatiseren

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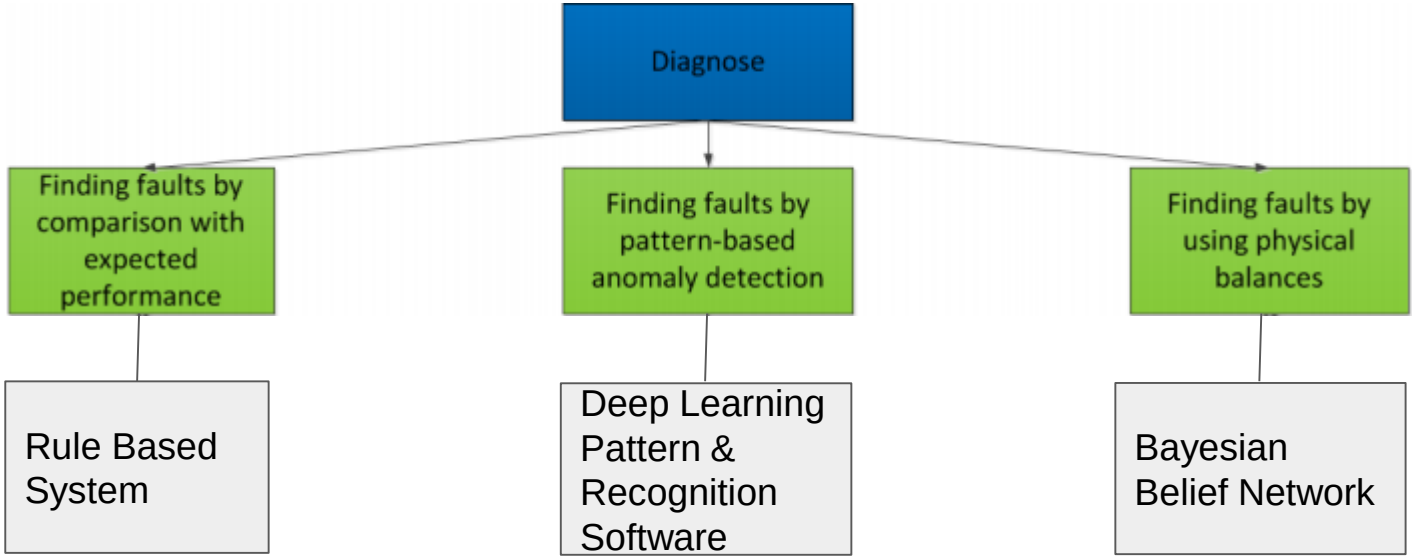
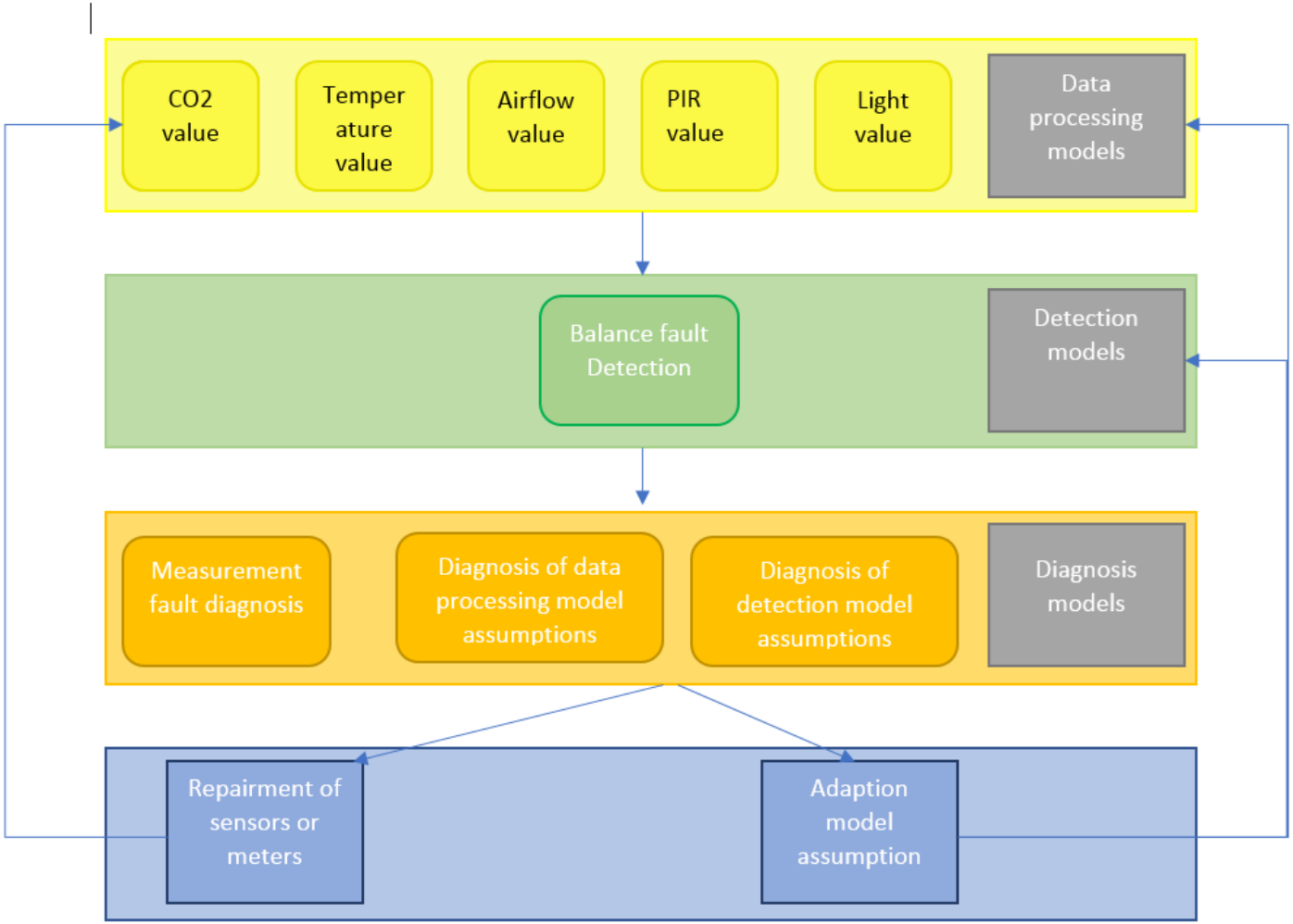

Diagnose
Finding faults by comparison with expected performance
Finding faults by pattern-based anomaly detection
Finding faults by using physical balances
Rule Based System
Deep Learning Pattern & Recognition Software
Bayesian Belief Network


CO2 value
Temper ature value
Airflow value
PIR value
Light value
Data processing models
Balance fault Detection
Detection models
Measurement fault diagnosis
Diagnosis of data processing model assumptions
Diagnosis of detection model assumptions
Diagnosis models
Repairment of sensors or meters
Adaption model assumption

Rule Based System:

	A	B	C	D	E	F
Occupancy	√	√	-	√	√	-
Ventilation	√	√	-	-	√	-
Lights on	√	√	-	√	√	-
Temp normal	√					√
Temp high		√	(√)	√		
CO2 normal	√				(√)	√
CO2 high		√	√	√	(√)	
CO2 constant					√	
	normal situation	too many people in the room	PIR sensor defect	ventilation defect	CO2 sensor defect	room not in use

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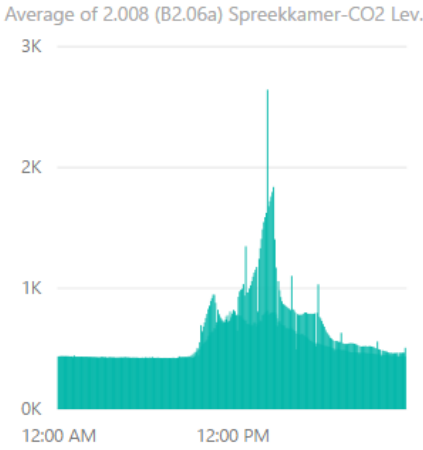
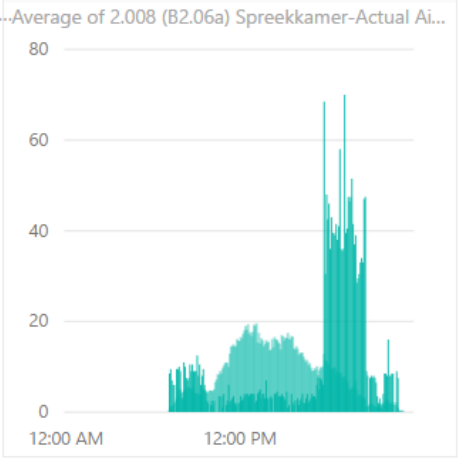
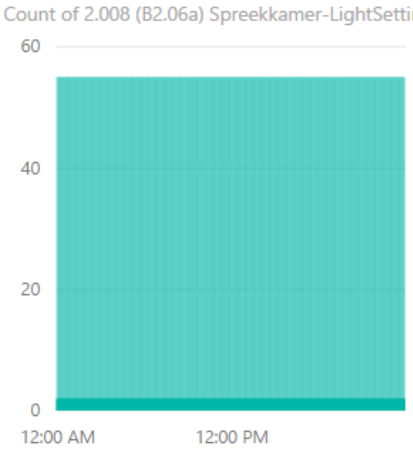
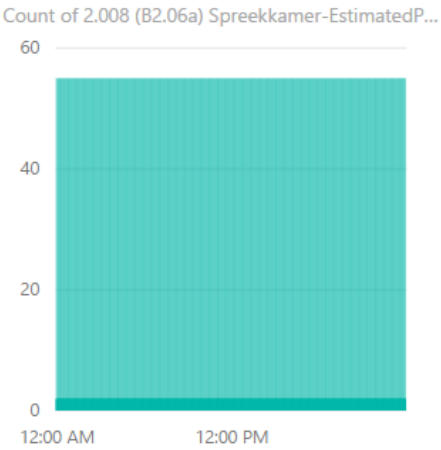
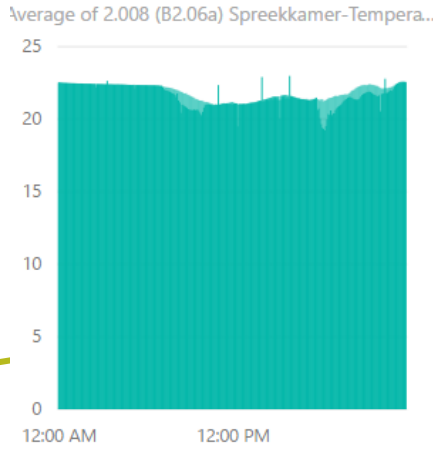
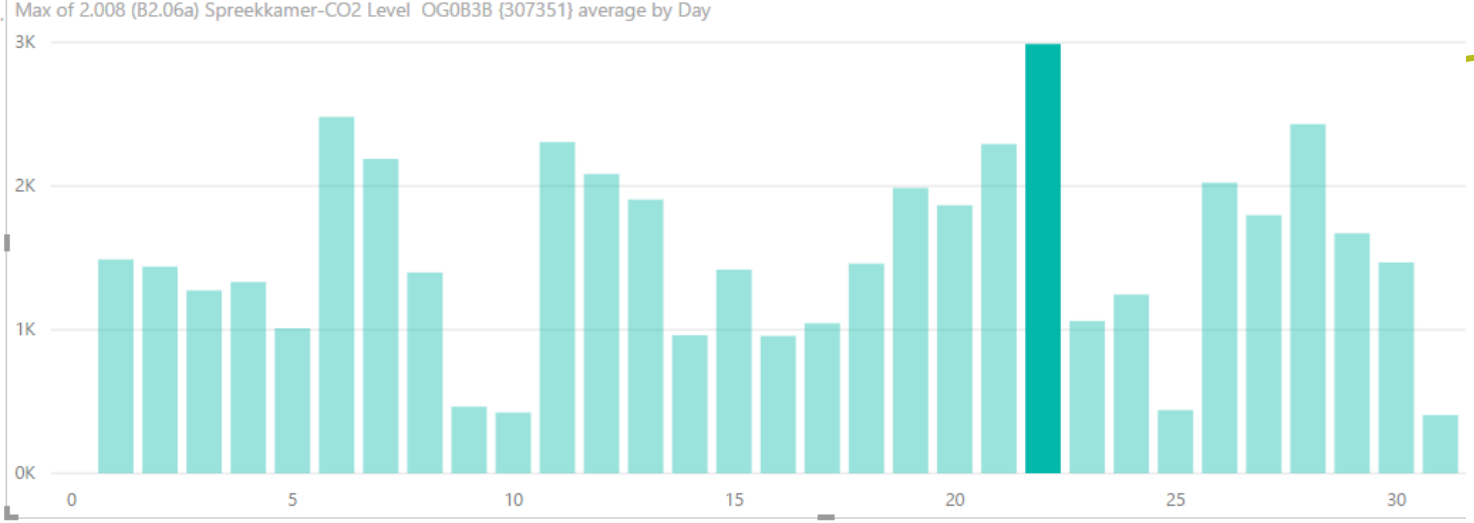

Average of 2.008 (B2.06a) Spreekkamer-CO2 Lev...
3K
2K
1K
0K
12:00 AM
12:00 PM


Average of 2.008 (B2.06a) Spreekkamer-Actual Ai...
80
60
40
20
0
12:00 AM
12:00 PM


Count of 2.008 (B2.06a) Spreekkamer-LightSettin...
60
40
20
0
12:00 AM
12:00 PM


Count of 2.008 (B2.06a) Spreekkamer-EstimatedP...
60
40
20
0
12:00 AM
12:00 PM


Average of 2.008 (B2.06a) Spreekkamer-Tempera...
25
20
15
10
5
0
12:00 AM
12:00 PM


Max of 2.008 (B2.06a) Spreekkamer-CO2 Level OG0B3B {307351} average by Day
3K
2K
1K
0K
0
5
10
15
20
25
30

Zwakte Rule Based System:

- Gebaseerd op input van mensen
- Kan niet omgaan met verschillende defecten die tegelijkertijd optreden
- Is absoluut, het is het 1 of het ander
- laat de oorzaak niet zien

Deep learning & Pattern Recognition:

Tool: Spyder(Python)

```python
from sklearn import tree

clf = tree.DecisionTreeClassifier()


# [hoogte, gewicht, schoenmaat]
X = [[181, 80, 44], [177, 70, 43], [160, 60, 38], [154, 54, 37], [166, 65, 40],
     [190, 90, 47], [175, 64, 39],
     [177, 70, 40], [159, 55, 37], [171, 75, 42], [181, 85, 43]]

Y = ['male', 'male', 'female', 'female', 'male', 'male', 'female', 'female',
     'female', 'male', 'male']


clf = clf.fit(X, Y)

prediction = clf.predict([[190, 70, 43]])

print(prediction)

```

AGSE

GESCHOOL

BBN:

Tools: Genie en Saw

Genie:

Schoonmaken data en link tussen variabelen vinden

Saw:

Resultaten aanwezig maar nog geen visualisatie

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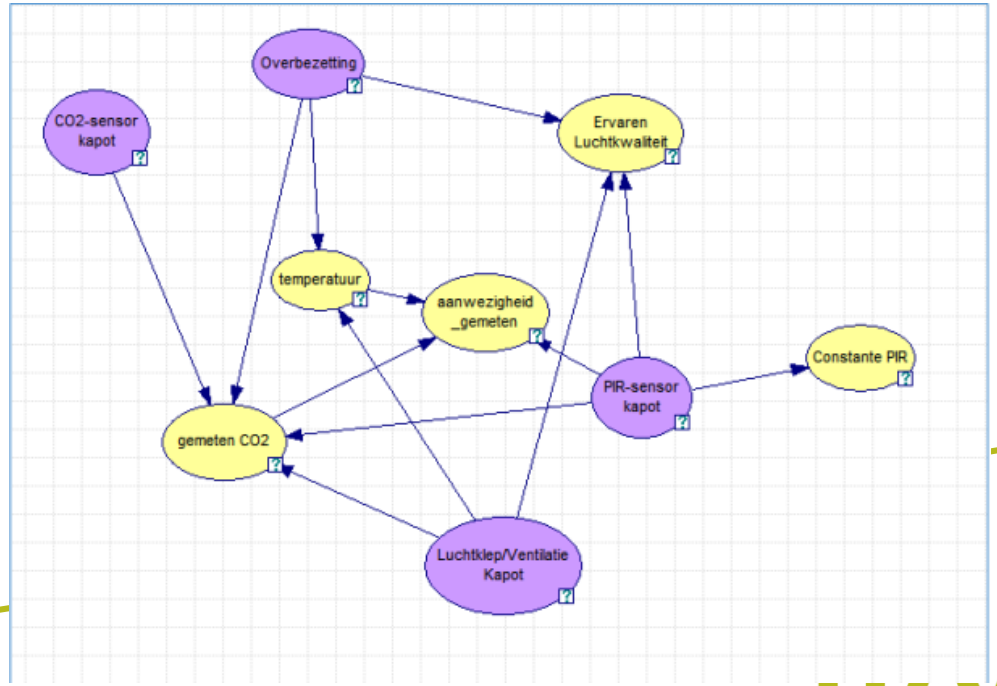
BBN:



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Planning:

Milestone 1 afronden:

Anomalieën detecteren van grote dataset

ML-methode testen op dataset

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Vragen?

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