



AIRPORT OPERATOR AND THE REINFORCEMENT AGENT

TASK FORCE: SWISSPORT X



GOAL



**Task
Recognition**



**Delay
Identification**



**Identification
Reason of
Delay**



**Notification to
the Supervisor**



MACHINE AUTOMATION

ADVANCED TASK RECOGNITION AND SUPERVISION



**Recordings of the
work processes**

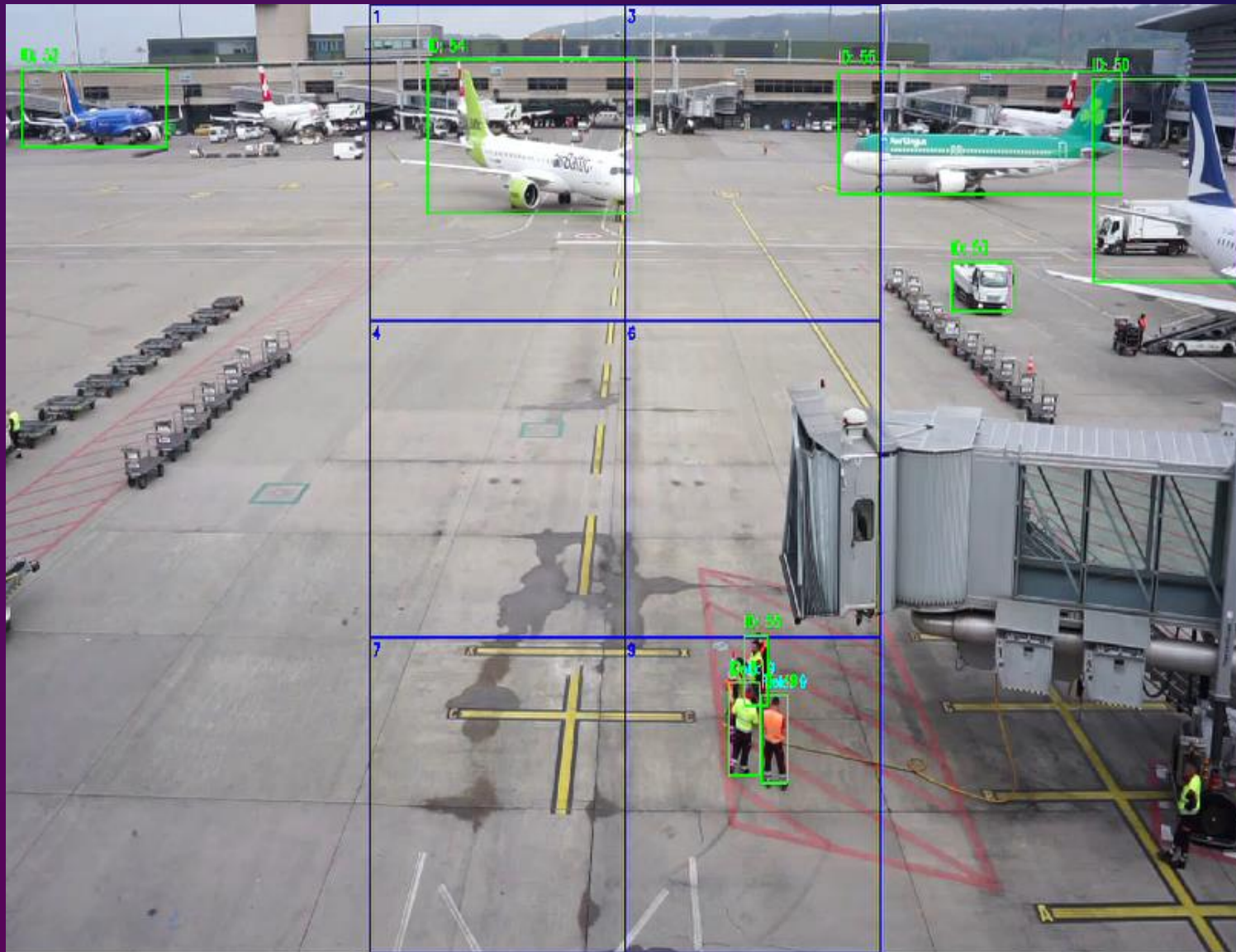


**Recognising the
objects and their
position in the video**



**Classification and
measurement of the
performed tasks and
their duration**

- ❖ Object Detection using Yolo
- ❖ Implementation of Deepsort for moving objects
- ❖ Added Grid to recognize tasks and measure time of work
- ❖ forward to knowledge graphs





KNOWLEDGE ENGINEERING

KEY FEATURES, TASK, RESOURCES AND DELAY FACTORS

Common Reasons for Delay / Metar

Documented delay reasons are recorded in knowledge databases.

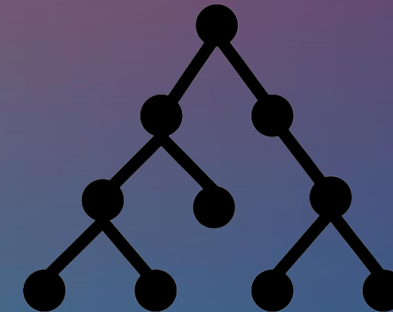
Adverse weather conditions may trigger an increased readiness forecasted by established rules



Plane Reconfiguration

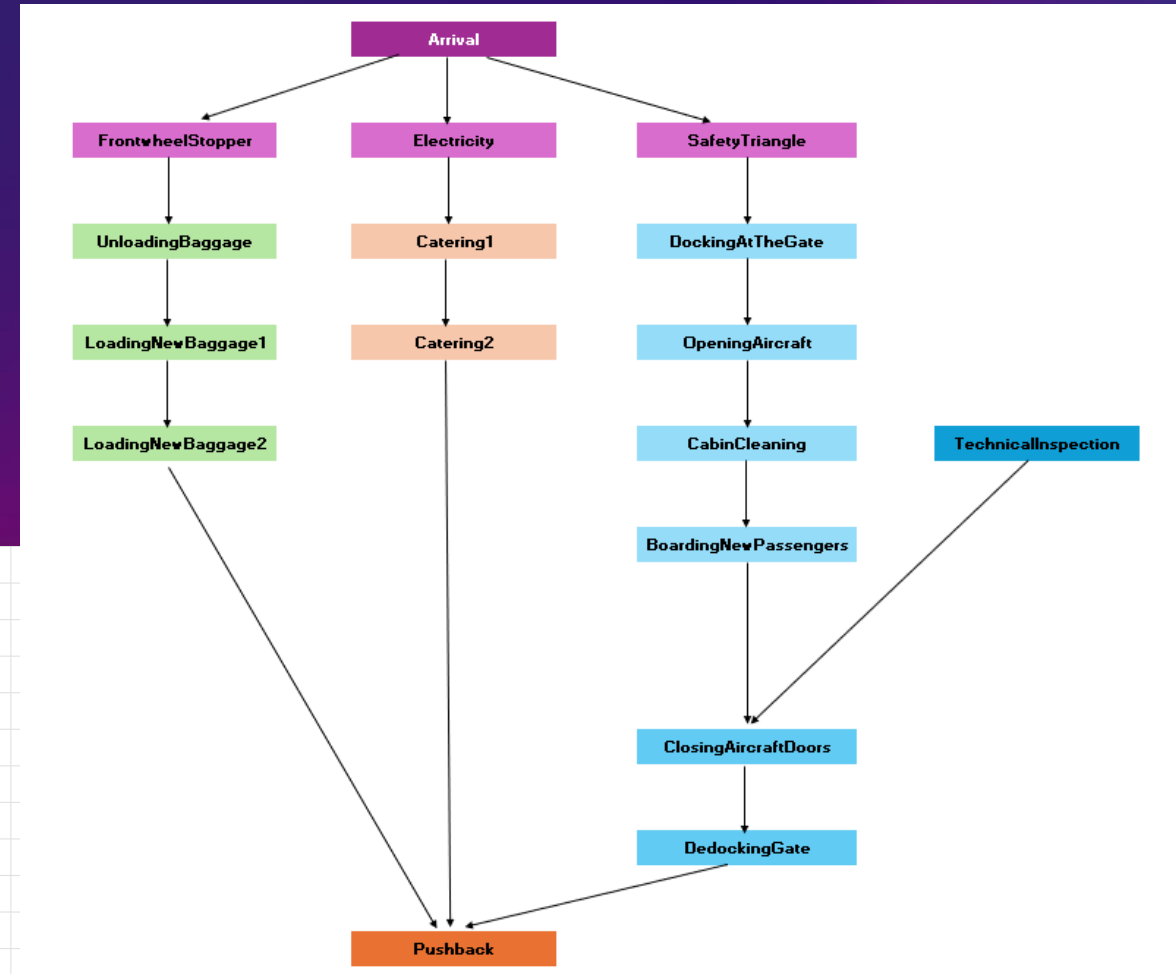
Preparation tasks are recorded with associated time, personnel requirements, and location.

Task sequencing for recovery is defined by established rules.



DURATION OF ACTIVITY & DEPENDENCIES

Task no.	Task	Duration
Task 0	Arrival	00:00:39
Task 1	Frontwheel stopper	00:00:06
Task 2	Electricity	00:47:52
Task 3	5 Safety triangle	00:00:51
Task 4	Docking at the gate	00:01:13
Task 5	Unloading baggage	00:13:44
Task 6	Opening Aircraft	00:00:10
Task 7	Passenger disembarkation	00:09:08
Task 8	Catering 1	00:09:10
Task 9	Cabin cleaning	00:07:56
Task 10	Loading new baggage 1	00:29:28
Task 11	Catering 2	00:05:35
Task 12	Boarding new passengers	00:16:50
Task 13	Technical inspection (Pilot)	00:01:07
Task 10	Loading new baggage 2	00:09:26
Task 14	Closing aircraft doors	00:00:10
Task 15	Dedocking gate	00:01:47
Task 16	Pushback and taxiing	00:01:26

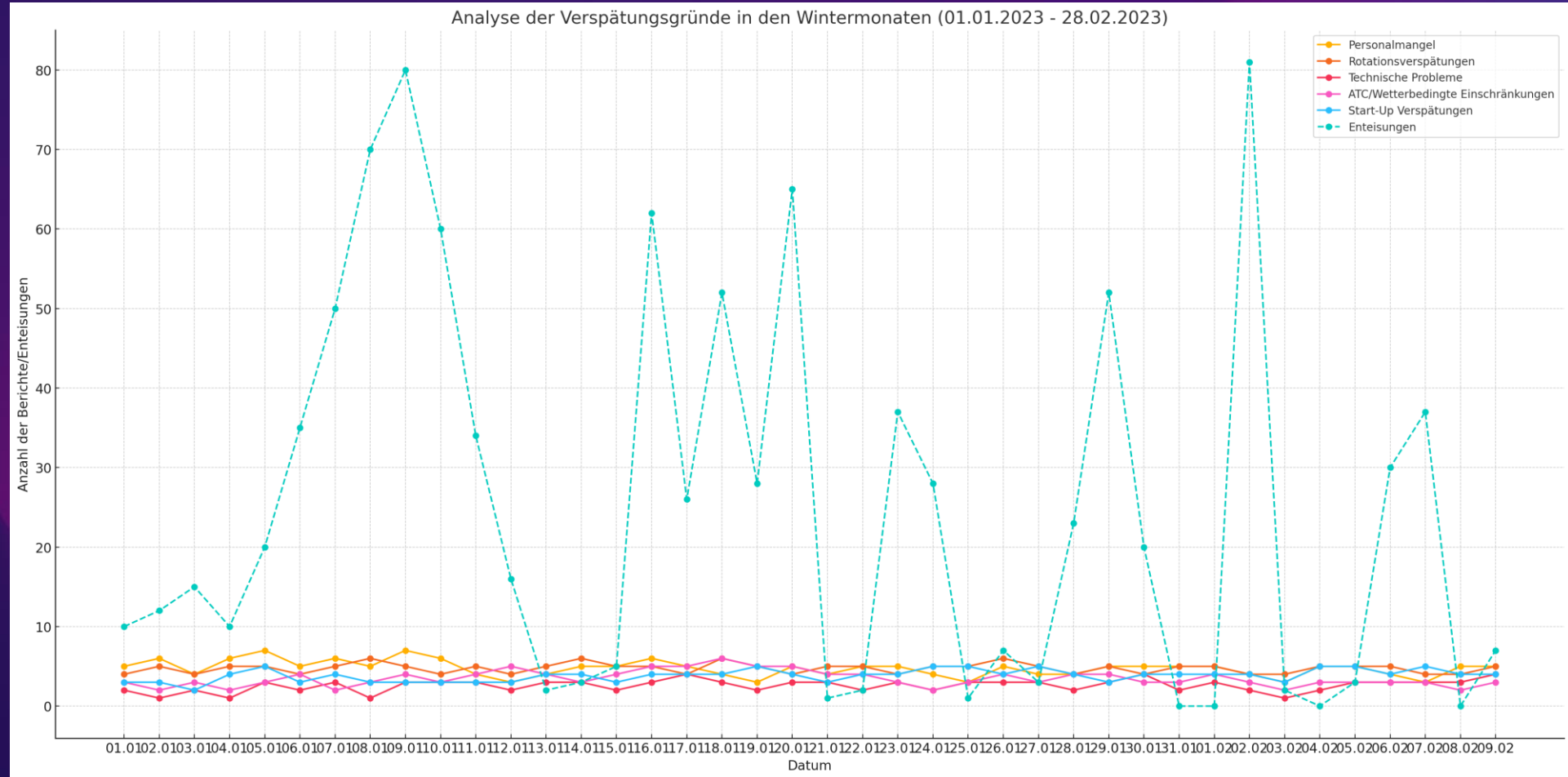


DE-ICING DURING WINTER SEASON

- ❖ Pattern recognition
- ❖ De-icing stand out the most
- ❖ Implementation of rules like weather conditions
- ❖ Degree < 3°C = Notification
- ❖ early detection reduces delays

Possible Solutions:

- ❖ Increasing the Icing pads
- ❖ De-icing technology



OVERVIEW FOR SUPERVISOR

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SwissportX - Delays

Renee McKelvey
Supervisor

Delays - Flight LX2254

Task	Delay Time	Status	Reason for Delay
Cabin cleaning	10 min	in progress	in progress
Boarding new passengers	-	on hold	on hold
Closing Aircraft	-	on hold	on hold

Solution 1

Suggestion:
Add two additional cleaning crew members to expedite the cabin cleaning process.

Explanation:
Past scenarios show, two additional cleaning crew members improve cleaning time.

Execute

Solution 2

Suggestion:
Reassign one maintenance worker to assist with cabin cleaning.

Explanation:
System detected one maintenance worker that is not needed and can assist with cleaning.

Execute

SwissportX

Renee McKelvey
Supervisor

Flight LX2254

Task	Start	End	Status	Delay	Delay Time
Catering 1	27 Oct, 2024 : 08:10	27 Oct, 2024 : 08:20	complete	No	-
Disembarkation	27 Oct, 2024 : 08:06	27 Oct, 2024 : 08:17	complete	No	-
Cabin cleaning	27 Oct, 2024 : 08:18	-	in progress	Yes	10 min
Boarding new passengers	-	-	on hold	Yes	10 min
Inspection Aircraft	27 Oct, 2024 : 08:25	27 Oct, 2024 : 08:28	complete	No	-
Closing Aircraft	-	-	on hold	Yes	10 min

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Upcoming Flights

Flight Nr.	Arrival ZRH	Destination	Departure	Status
BA 773	27 Oct, 2024 : 10:00	London LHR	27 Oct, 2024 : 11:15	on Time
KL 1920	27 Oct, 2024 : 10:00	Amsterdam	27 Oct, 2024 : 11:15	on Time
LX 188	27 Oct, 2024 : 12:00	Shanghai	27 Oct, 2024 : 13:30	on Time
OS 570	27 Oct, 2024 : 14:00	Wien	27 Oct, 2024 : 15:30	on Time

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INNOVATIVE SOLUTIONS

- ❖ **Long-term cost savings** through reduced delays and improved operational efficiency
- ❖ **Scalability** for multiple locations worldwide
- ❖ **Real-time monitoring and automatic escalation** when delays are detected
- ❖ **Fully automated analysis system**
- ❖ **More effective use of labour**
- ❖ **Delay information and suggested solutions to supervisor**
- ❖ **Explainability AI**
- ❖ **Causal AI**

Budget for the Project: CHF 1'250'000
(CHF 30,000 per year (for ongoing maintenance, support and updates))



**Let's work together
for smarter solutions and
innovation in airport
operations!**



Thank you!