VelOps

Allister Kohn

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Who am I?

- Allister, 23 years old
- Based in the Paris region
- Scientific Baccalaureate (2019)
- Graduate Engineer (2024)
- MSc in Data Sciences & Business Analytics (2025)
- Career focus:

Data Science → ML Engineering → MLOps

ESSEC BUSINESS SCHOOL

CentraleSupélec

Vélib’

- Smovengo is the operator of Vélib’ Métropole, the public bike-sharing service of the Paris metropolitan area
- Vélib’ is the largest station-based bike-sharing system in the world, covering Paris and the wider Île-de-France region
- Smovengo provides open access to Vélib’s real-time operational data through a public API

Key figures:

- 1 station approximately every 300 meters in Paris
- 1,500 stations across Paris and the Île-de-France region
- 20,000 bicycles, including 40% electric-assisted bikes
- 940,000 unique users in 2025

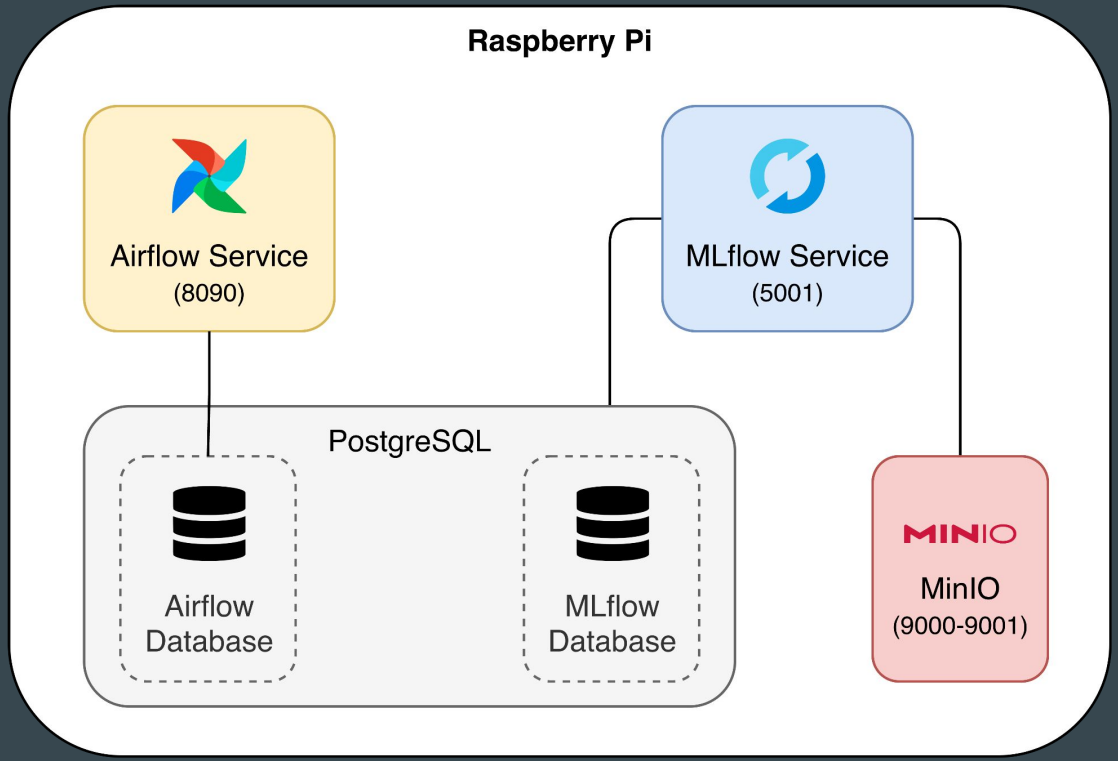
Smovengo

Source: group-indigo.com

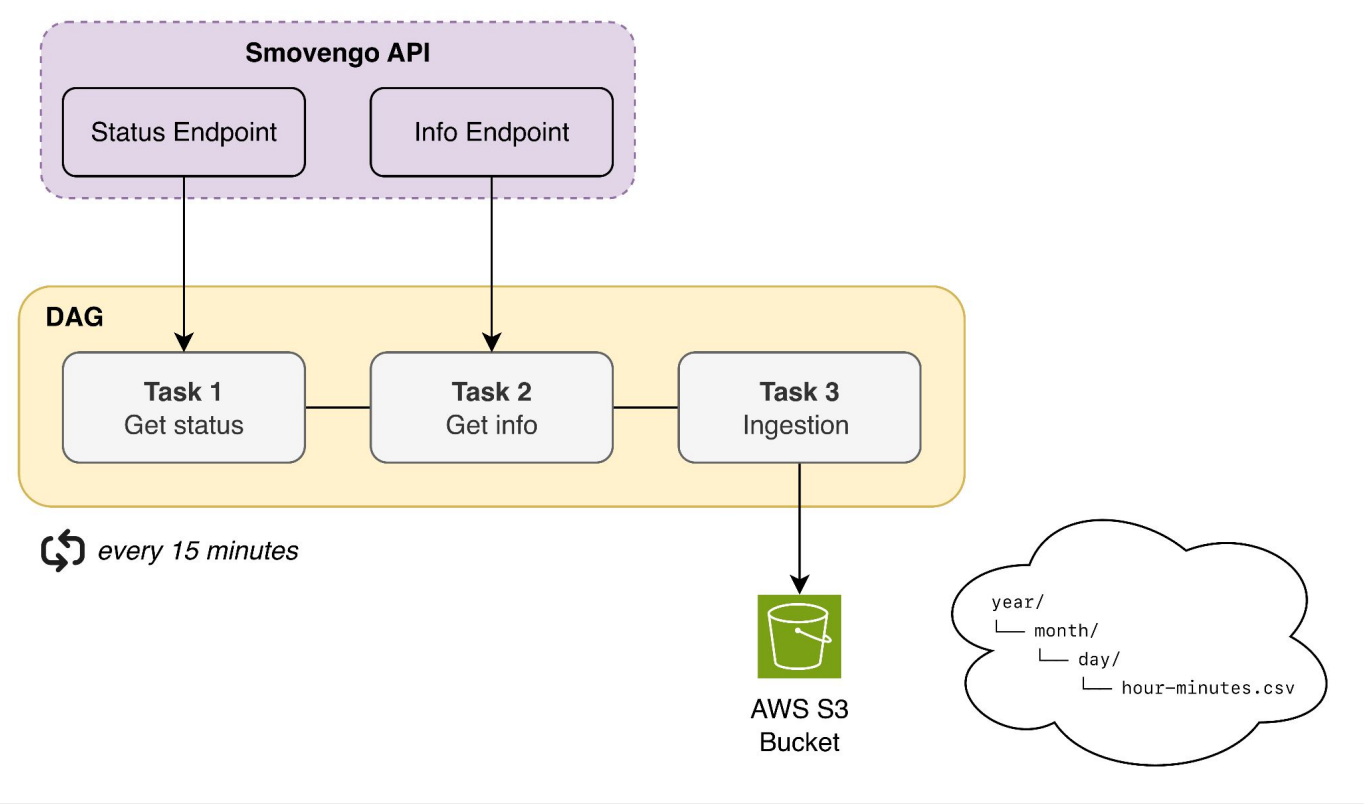
Introduction

- VelOps is an end-to-end machine learning project using Vélib' data
- Its goal is to predict bike availability states at station level within a two-hour horizon
- The system runs on a Raspberry Pi, highlighting a lightweight and resource-efficient setup
- The project relies on a broad set of modern data technologies across the full workflow
- The project is structured into two independent components: one dedicated to data ingestion and transformation, and another focused on machine learning

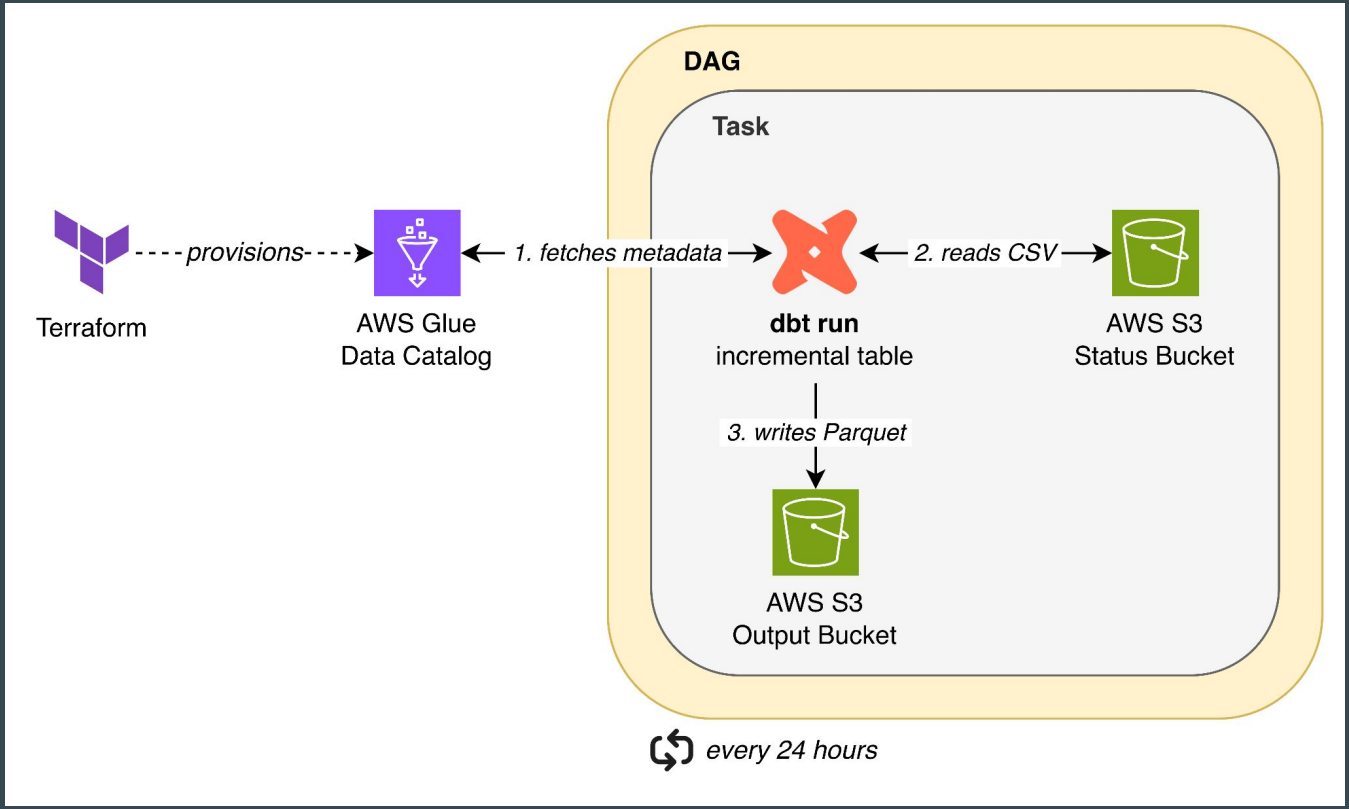
Infrastructure



Data Ingestion

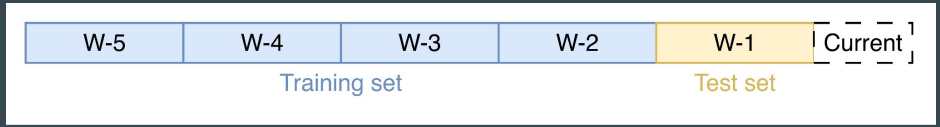


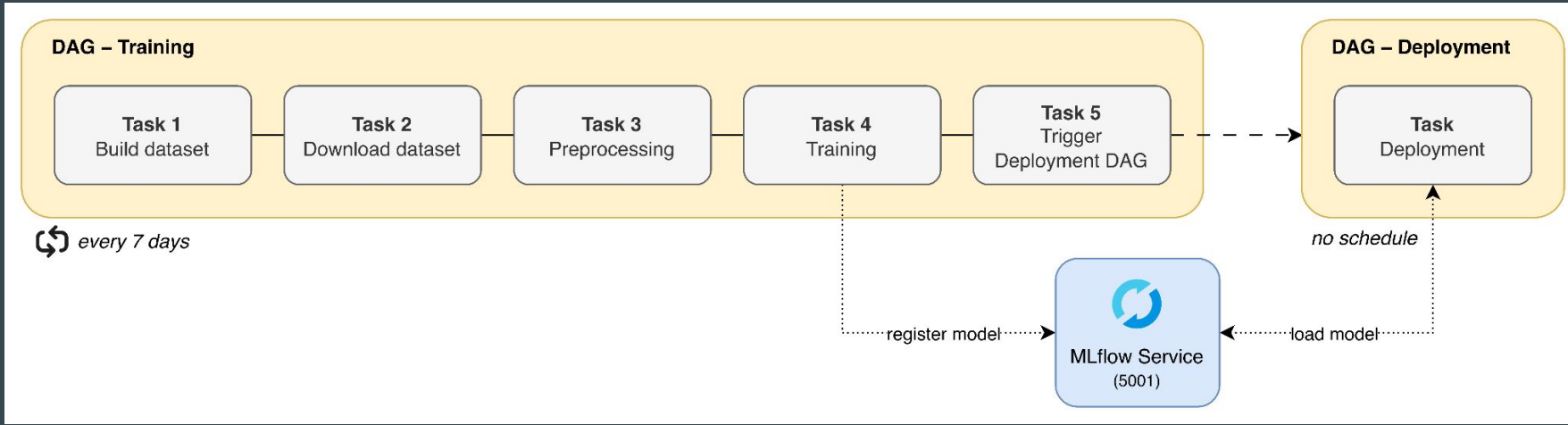
Data Transformation



Machine Learning

The dataset covers a 5-week period, which corresponds to 35 days, 840 hours, or 3,360 15-minute intervals. Given the 1,500 stations in the network, this results in a total of 5,040,000 status records.





Sources

- https://www.group-indigo.com/metier/smovengo/
- https://www.smovengo.fr/
- https://www.velib-metropole.fr/

Contact

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