FAIRTIQ

Machine learning for travel mode detection
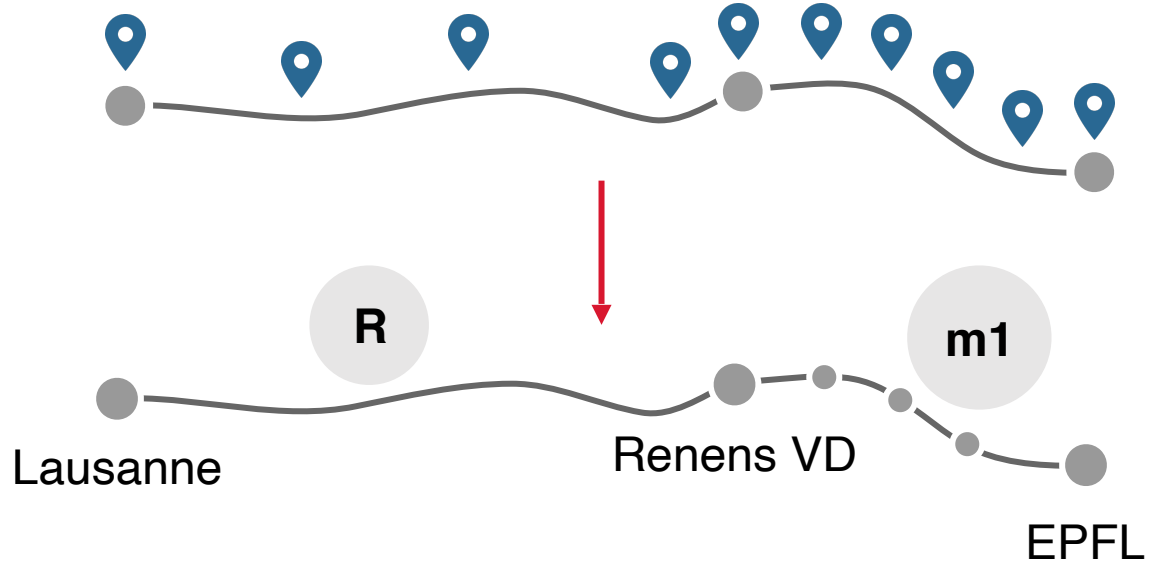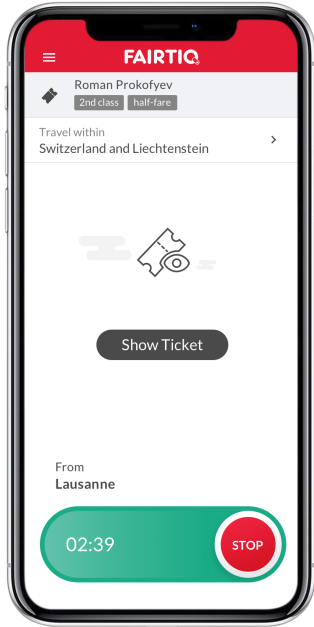
Roman Prokofyev

Co-founder and Chief Scientist
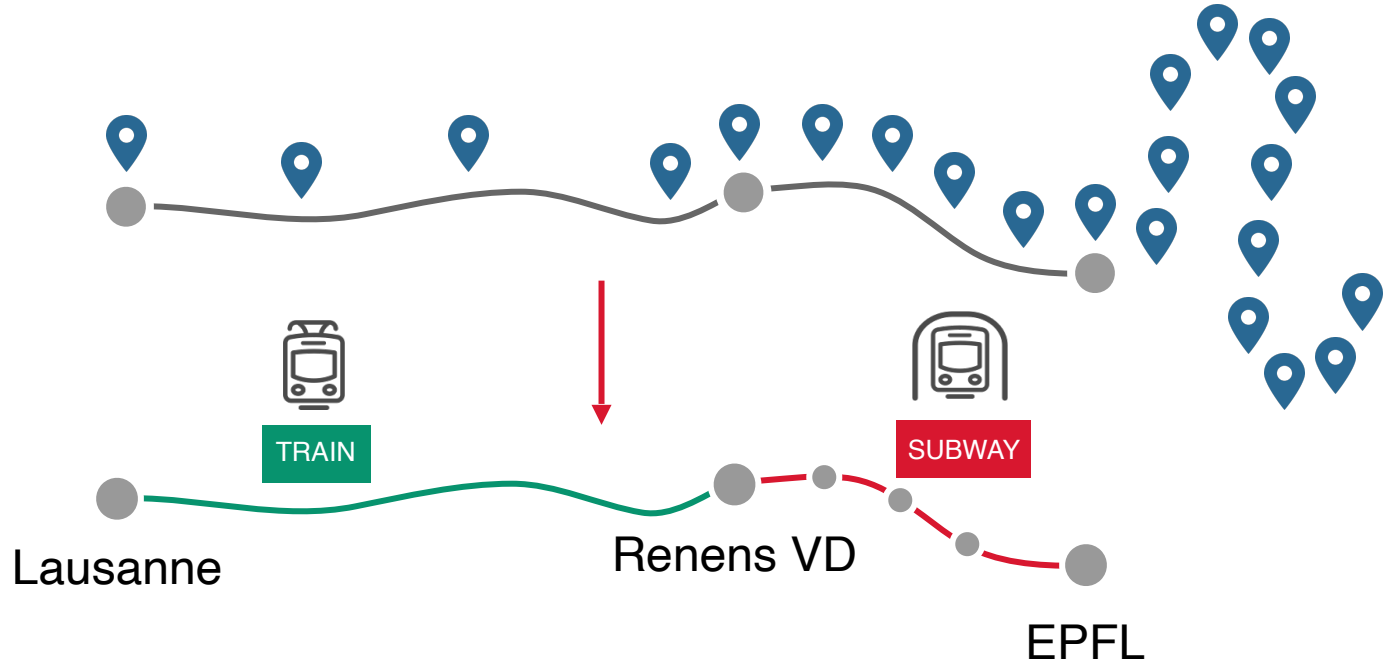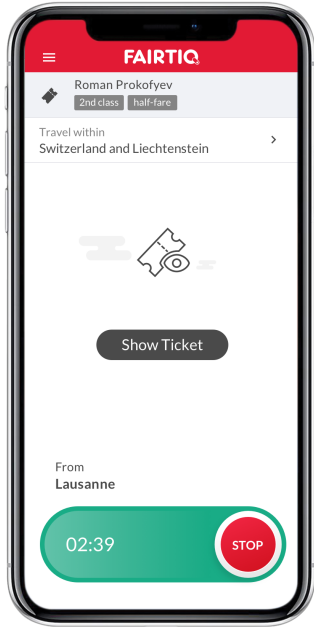
How FAIRTIQ works?

Travel mode detection?

TRAIN

SUBWAY

Lausanne

Renens VD

EPFL

3

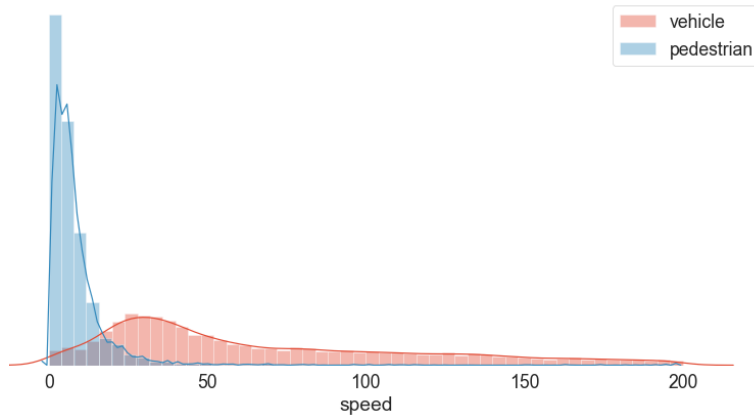# Labelling the data: manually

Lausanne
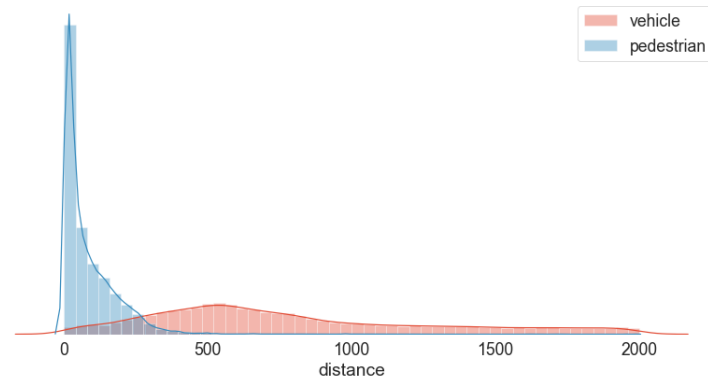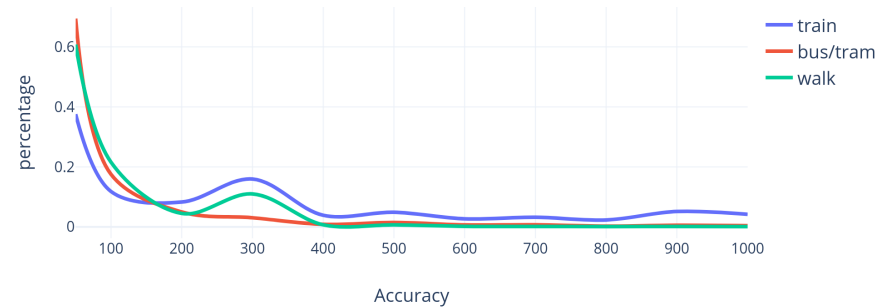
Renens VD

EPFL
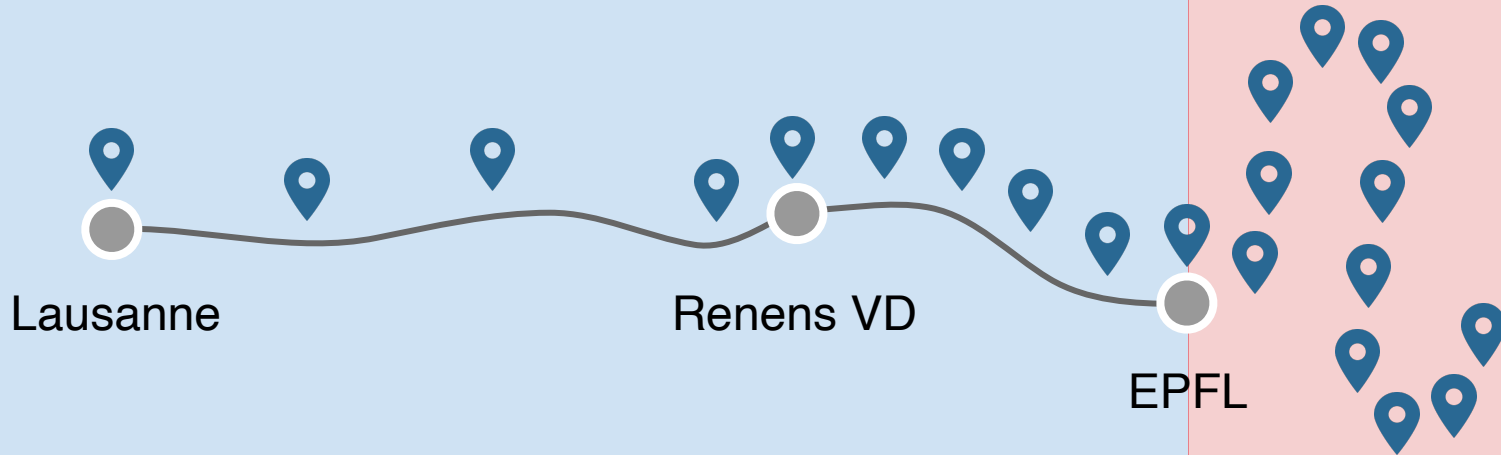
Input: sliding time windows
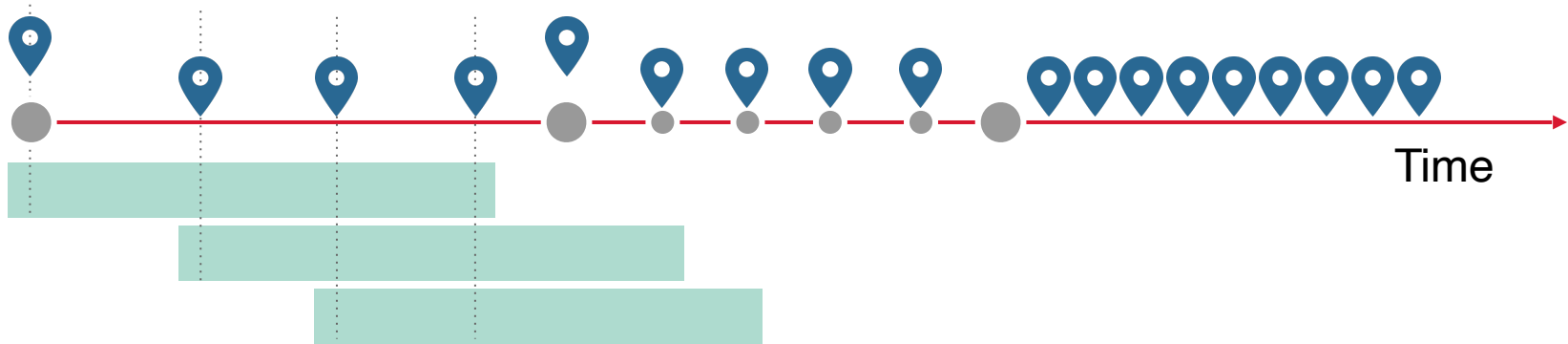
- Min # of locations in a window
- Min duration of a window ~ 3 min.
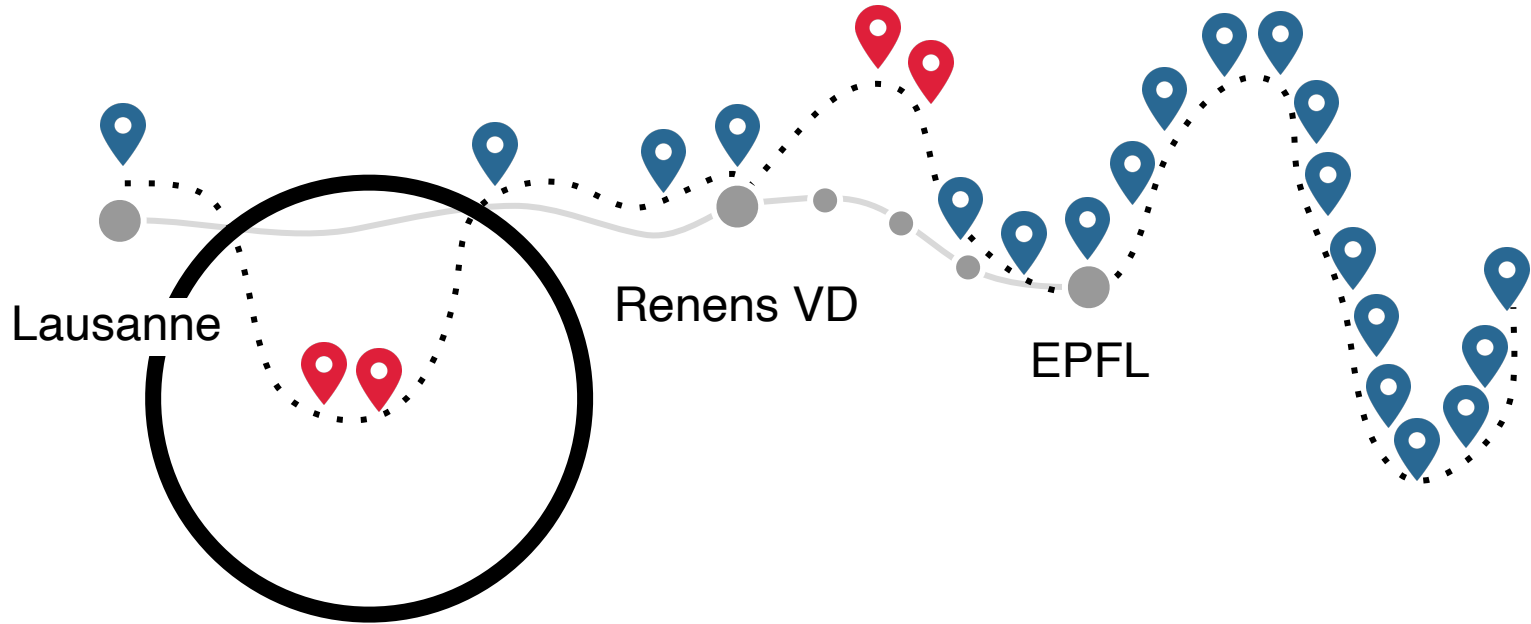
Features: mostly statistical

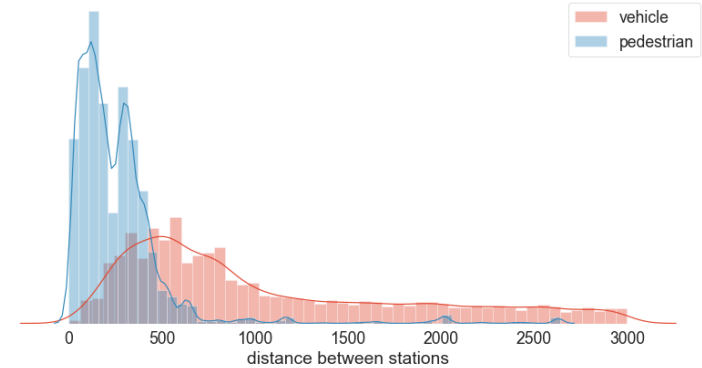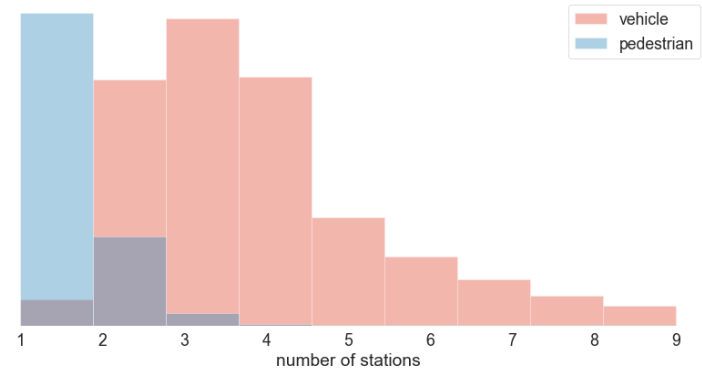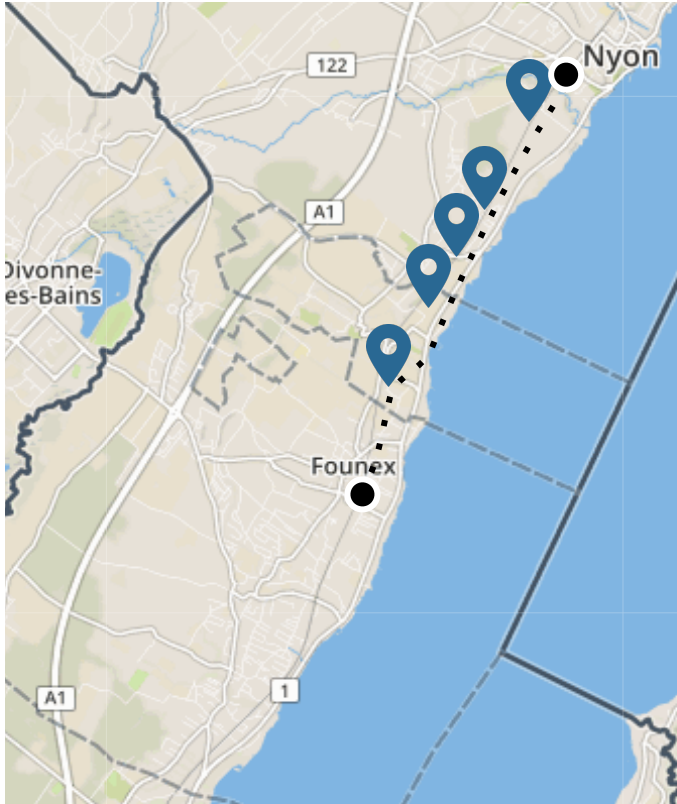- Speed min/max/percentiles/std/...
- Distances
- Location accuracy

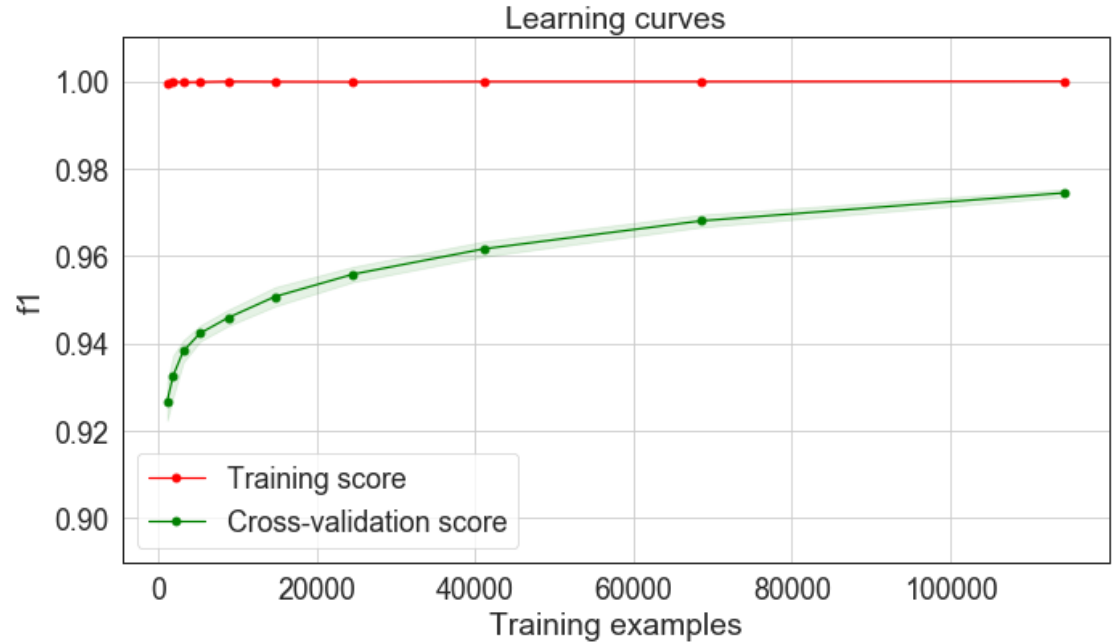Accuracy of location data: vehicles

Why percentiles/medians? Outliers
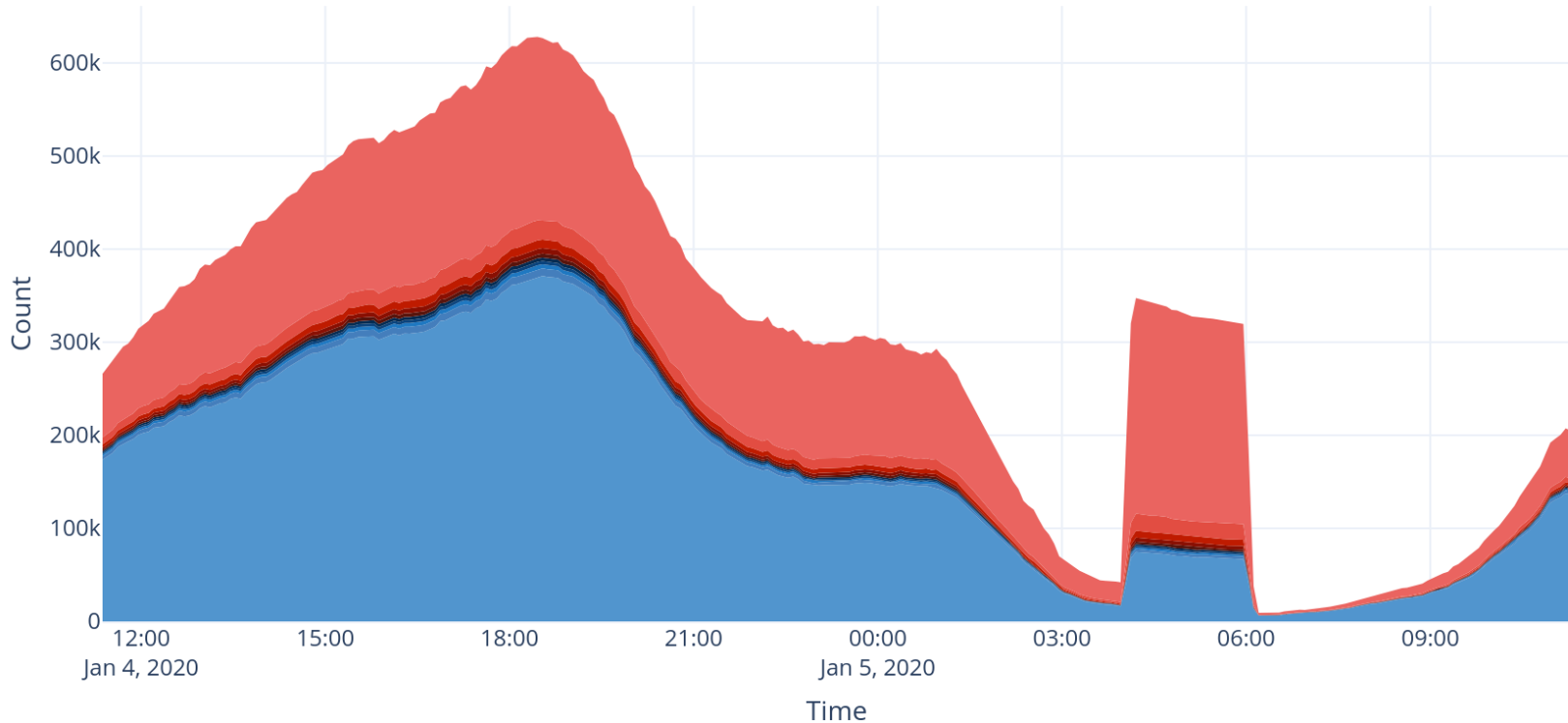
Features based on domain data

First model: random forest

- Quick to implement and to inspect
- Robust with a low # of training samples

Learning curves

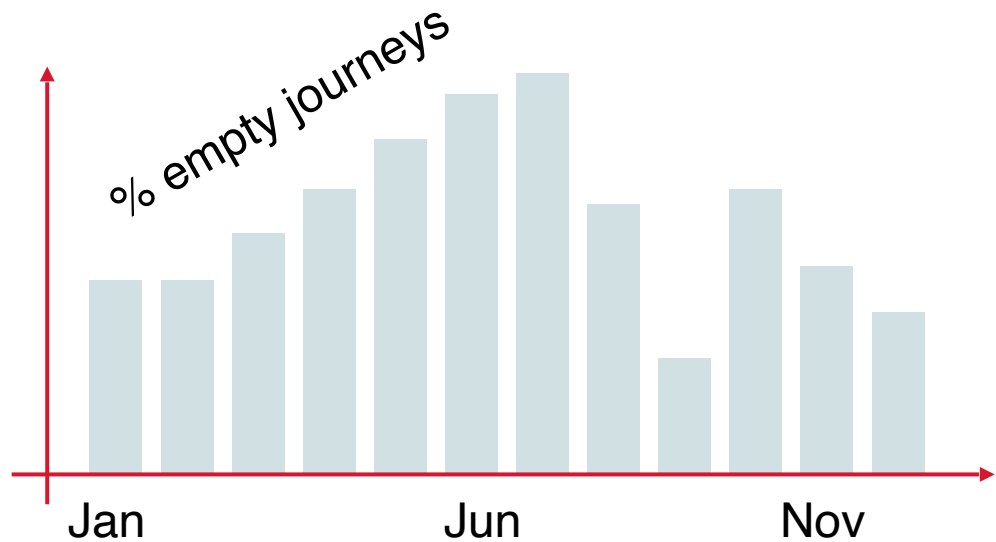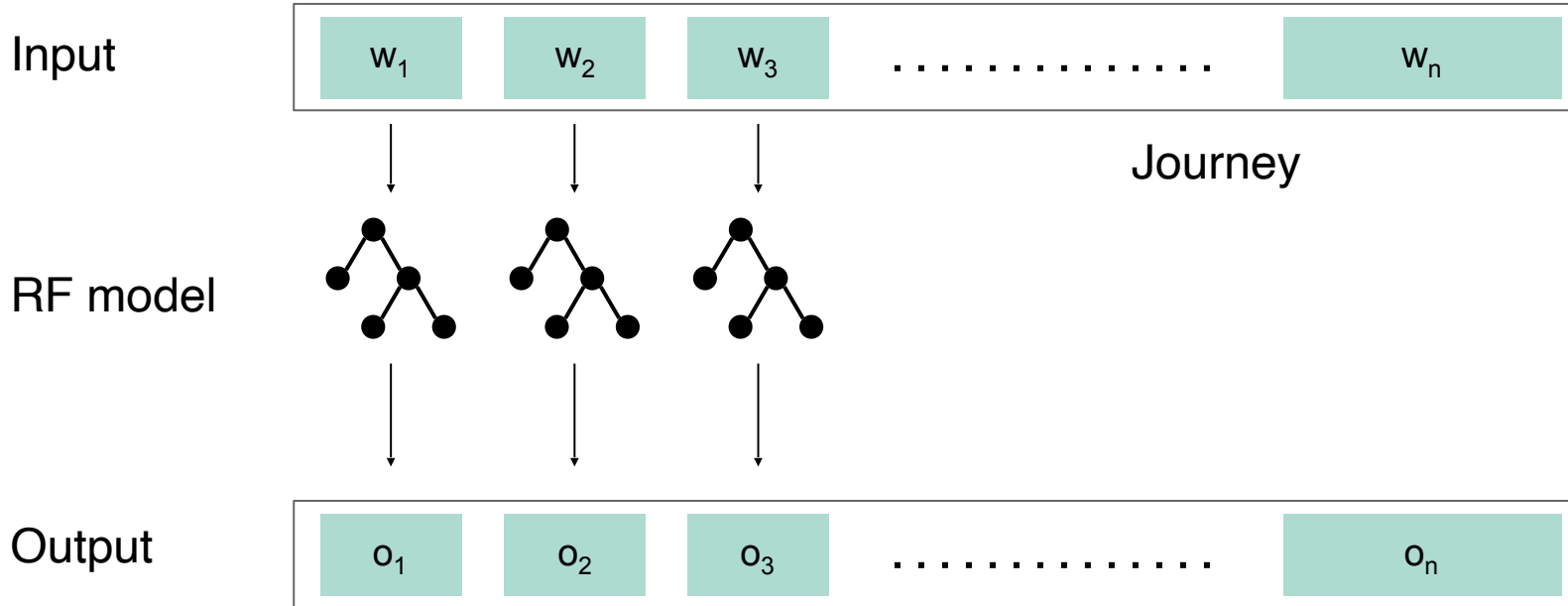# What happened with forgotten checkouts

Funiculars

- Slow movement – can be confused with walks
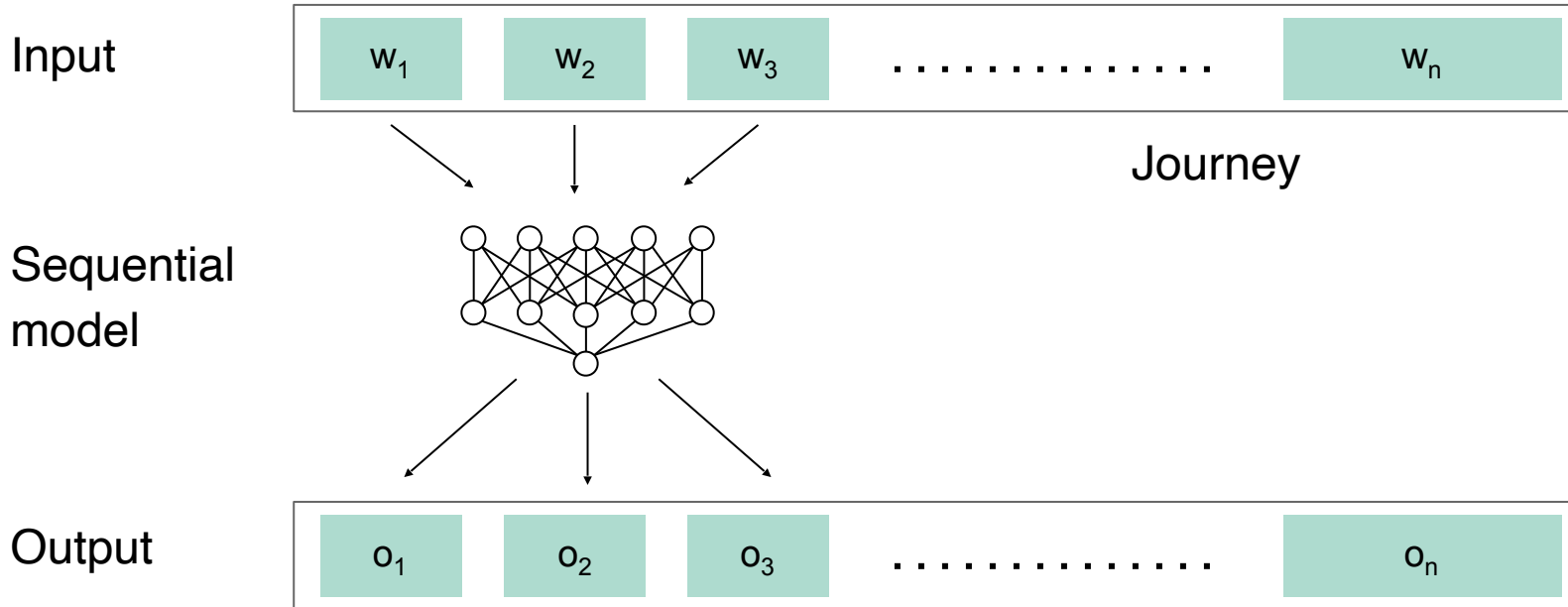- Feature that measures distance to the funi route

% empty journeys

Jan   Jun   Nov

What's next?

The "problem" with Random Forest model

The advantages of NN models

Input

| w_1 | w_2 | w_3 | . . . . | w_n |

Journey

Sequential model

Output

| o_1 | o_2 | o_3 | . . . . | o_n |

Thank you for your attention

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