



Surveillance Data Analysis System: S.O.D.A.

As many other major Airports, FRA is operating at its limit. Airport infrastructure changes (like RWY extensions, TWY changes, additional Terminals etc.) are expensive and time intensive. Soft optimizations in ATM and ground control provide faster and cheaper ways to use the given airport layout to its fullest potential. For optimization however, knowledge about the internal processes and dependencies of the airport is required.

Today, a lot of data is recorded and in the future, the amount of recorded data will increase drastically. But data by itself is not knowledge, data has to be refined and processed to extract knowledge. S.O.D.A. is basically a system that extracts knowledge from surveillance data (MLAT/ADS-B) that is recorded for operational purposes.

S.O.D.A. can be used for airport master-planning, maneuvering areas maintenance scheduling, refined data for calculating noise emissions during taxiing or simulations. Also other, more specific tasks can be addressed, like

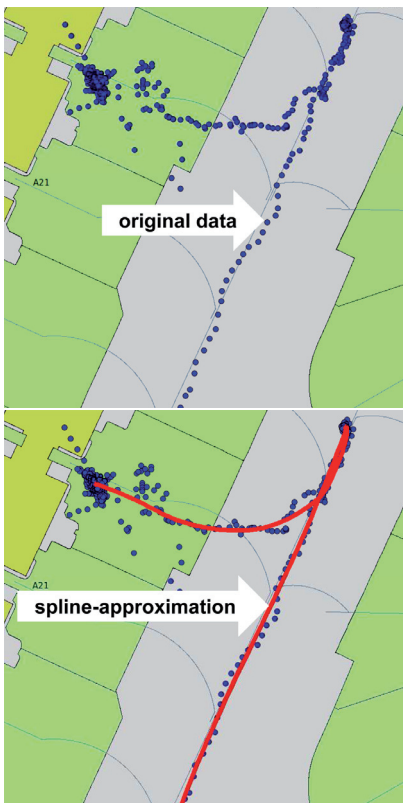
- calculate RWY- and TWY occupancy times
- measure the speed of A/C during taxi
- measure how long a push-back takes
- find the take-off/touch-down point
- create A/C climb profiles
- analyze queuing/traffic jams during taxiing and trace the reason for their occurrence

But more importantly, S.O.D.A. is in its structure very flexible and many, previously unasked, questions can be answered with minimal additional work.

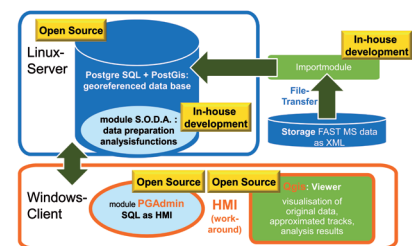
How S.O.D.A. works

The data source of S.O.D.A. is acquired by a FAST MS fusion of multilateration and surface radar. This data holds a lot of challenges for S.O.D.A. due to outliers, gaps, missing values and the huge amount of data that needs to be processed. First, the data refinement process generates stable, error resistant movement tracks. These refined tracks are then used to achieve the above mentioned tasks by filtering, recombination and advanced statistic algorithms. In a joint venture, FRAPORT and the DLR are developing advanced data refinement processes, analysis methods and knowledge generating processes to use the available data to its fullest potential.

Original data and their approximation



S.O.D.A. systemarchitecture



Runway exit distribution

