

Master Thesis:

Interdisciplinary data analysis of ATM network dynamics

Task Description:

Compared to other means of transportation, air transportation is considered to be unique regarding available datasets. This enables the definition of models that can capture and reproduce the spatiotemporal traffic scenarios. Based on industrial needs, datasets are generated from various sources and are updated at different rates. Together with DLR, the institute of air transportation systems is studying these datasets to improve air traffic flow management (ATFM). ATFM offers different types of regulations to accommodate the traffic in a safe and efficient mode. Apart from logical dependencies between traffic patterns and time of day, the aim of this study is to understand ATM network behavior for better short term (Tactical) predictions.

In other words this interdisciplinary topic is set to investigate possible correlations between ATFM regulation types and time of day. The study is regarded as interdisciplinary since the approach is based on analytical tools of dynamic data and time series. This master thesis will be supported by ATFM team to go through the following steps:

- Literature Review on ATFM, and time series,
- Introduction to data structure and related terminology,
- Modeling based on Short-range and long-range persistence,
- Software implementation (MATLAB or Python),
- Model validation and presentation of results,
- Discussion of future work and documentation

Requirements:

- Studies in Air Transportation & Traffic Eng. / Industrial Eng. /Mathematics etc. ,
- Motivation and ability to work independently and collaboratively,
- Programming skills (preferably MATLAB or Python),
- Knowledge sharing and Reporting abilities,
- High working knowledge of English.

Beneficiary points:

- Record of published papers,
- Good academic records,
- Background in ATM,

Deadline: *until position filled*

Duration: *Maximum 6 months*

Contact: (Please quote 'ATFMRES5.1' on all correspondence)

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