

Project Title

« Moisture Prediction – Curve Fitting »



Contact

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Challenge /
problem
description

Moisture analyzers [1] measure the moisture content of a material by monitoring the weight loss on drying. To reduce analysis time an embedded software functionality for METTLER TOLEDO moisture analyzer predicts the final moisture value before the measurement is completed [2]. Measurements typically take 5 to 30 min while a prediction can be available after 2 to 4 min, speeding up decision making for following process steps. The functionality is based on prior reference measurements that are specific to the customer's substance and analysis process. Recording the reference curves and setting up the functionality needs considerable time, effort and skill by the customer. Each evaluated substance requires a new reference data set.

Project goals /
value for the cus-
tomer

This industry collaboration project with METTLER TOLEDO is to evaluate the feasibility and realize a general solution employing AI techniques for providing a prediction of the moisture value. This solution should be independent of the measured substance and processes, such that no specific configuration is needed by the customer. This significantly reduces the setup effort and time by the customer and increases usability on the solution. In case of a successful feasibility study, there could be a potential future collaboration opportunity to integrate the evaluated solution in the market software product.

Research Ques-
tions

- Predict stable measurement result from first part of time series data
- The available data consists of full measurement curves (weight vs. time) and related meta data regarding the measurement method
- Analyze different approaches to address the problem and decide for the best suitable method for a feasibility study

Main require-
ments

- Predict final moisture value during measurement of a drying curve as early as possible (few minutes)
- Evaluate feasibility of general AI model for any analyzed substance and compare to existing deterministic algorithm

Further require-
ments

- Evaluate how the AI solution integrates in the full measurement process
- Provide continuous update and estimate of the prediction uncertainty
- Potential future collaboration to integrate the developed AI solution into the product during a follow-up project with METTLER TOLEDO

Links /
Datensätze /
Zusätl. Daten

Data set of 5000 full measurement curves of weight vs. time and related data on: moisture value and method parameters. See example data.

[1] <https://mt.com/moisture>; [2] [QuickPredict \(mt.com\)](https://mt.com/QuickPredict);