Institut für Photogrammetrie und GeoInformation

Institut für Photogrammetrie und GeoInformation,
Nienburger Straße 1, 30167 Hannover

Nienburger Straße 1, 30167 Hannover
Fakultät für Bauingenieurwesen
und Geodäsie

Institut für Photogrammetrie
und GeoInformation

Prof. Dr.-habil. Christian Heipke

M.Sc. Anne Ponick
Tel. +49 511 762-3931
E-Mail: ponick@ipi.uni-
hannover.de

Future prediction of an image sequence of a concrete mixing process using Deep Learning

Proposal for a Master thesis topic (DE/EN)

Concrete is one of the most widely used building materials in the construction industry - in Germany alone, several million tons of concrete are mixed and used every year. If the properties of concrete could already be determined during its production, it would be possible to control the concrete to the desired properties with suitable additives.

The properties of the concrete influence its flow behaviour around obstacles. An obstacle can also be an object that moves through the concrete and thus sets it in motion like the paddle in the mixer. One possibility is to learn the flow behaviour of the concrete in order to draw conclusions about its properties.

As part of the thesis, a Recurrent Neural Network (RNN), or other architectures of an RNN, such as a long short-term memory (LSTM) network, should be trained to continue the image sequences of the moving concrete or to predict any moment in the future. The network would thus learn features that implicitly contain the flow behaviour of the concrete. These learned features can then be used to predict the desired properties.

An advantage of this approach over a direct determination of the properties is that the neural network is forced to learn the properties from the flow behaviour.

Good programming skills are a prerequisite. Experience with the deep learning packages such as pytorch is a great advantage, as is prior knowledge of image analysis. The thesis can be written in German or English and will be supervised by Anne Ponick M.Sc.

Besucheradresse:
Nienburger Straße 1
30167 Hannover
www.ipi.uni-hannover.de