Edge detetection in grain stocks

Task

To the Edge detetection in grain stocks in front of harvesters is a measurement of characteristics in space necessary. From this measurement values a model of the grain stock is calculated, which is the basis for a control of drive direction from the harvester. It takes place thereby a minimization of the cutting losses during harvesting.

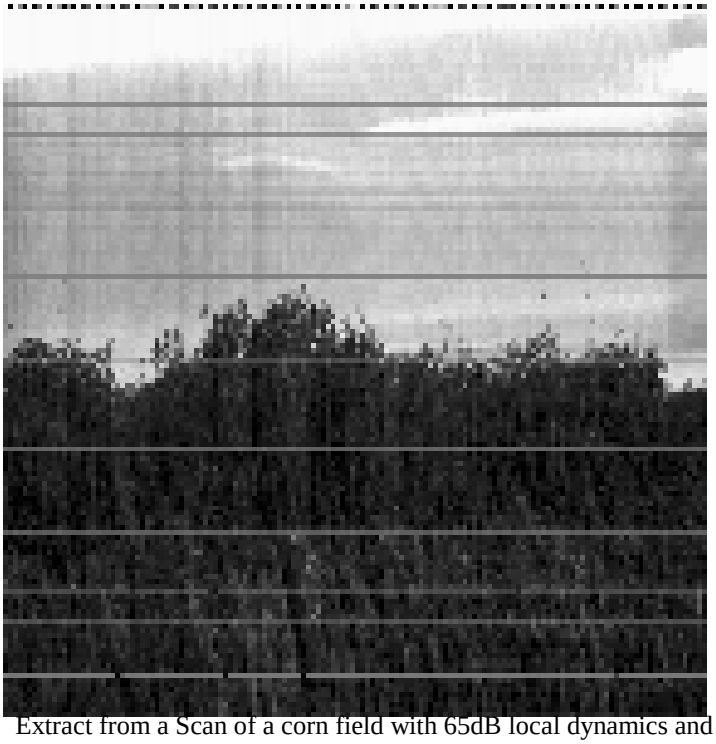
Following problems have been processed:

- It exists no simple object description - grain stock has a diffuse structure.
- It must working under natural light proportions (1 ... 100K lux).
- By the motion of its machine with up to 2m/s (perspectively 8m/s) is calculate so far as possible high image count per second.

Solution

The solution was found in the use of a stereo-line camera (SZK96 , SZK972).

For higher measuring rates developed a special Stereo camera which can be configured with maximal 15 image processors.



Extract from a Scan of a corn field with 65dB local dynamics and 130dB global dynamics (CCD-sensor)

A autonomic processor for the sensors prepares the image data, realizes the regulation of brightness and weighted the recordings. Is deleted worst recordings themself.
The brightness regulation works over an area of about 1 : 1.000.000 .

The following processing units works on interlaeve and analyse the image data. The communication controller of each unit collects the results and conducts it to the Arbiter. It transfers the data to the superior system. With one processor it is possible to calculate approximately 20 images/s by respective 23 measuring spots.

The solution requires a comprehensive integration of the image processing into the harvester.

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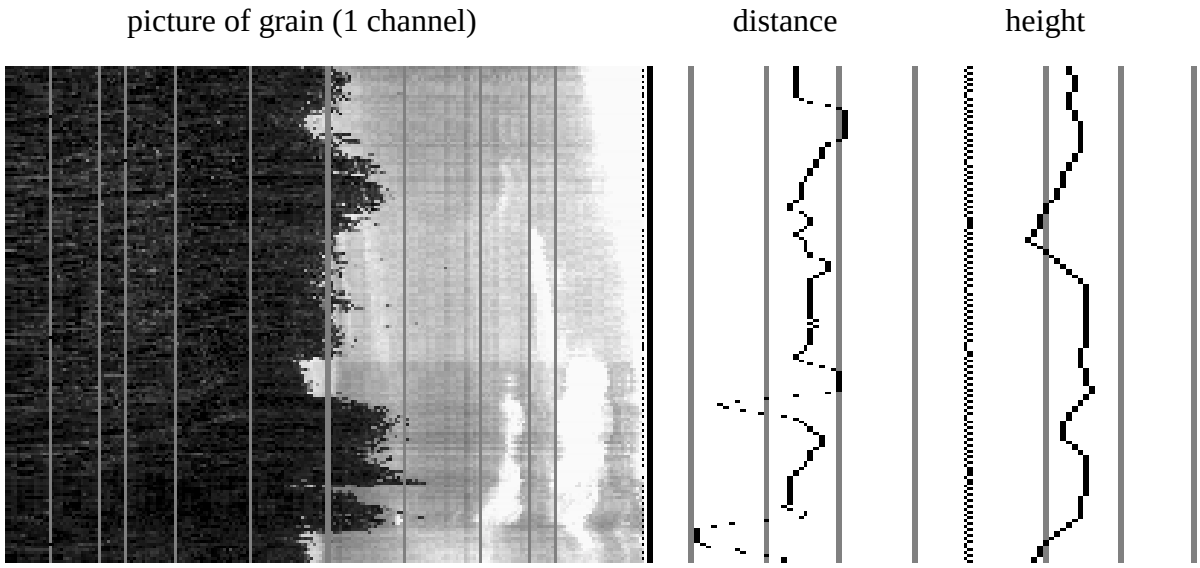
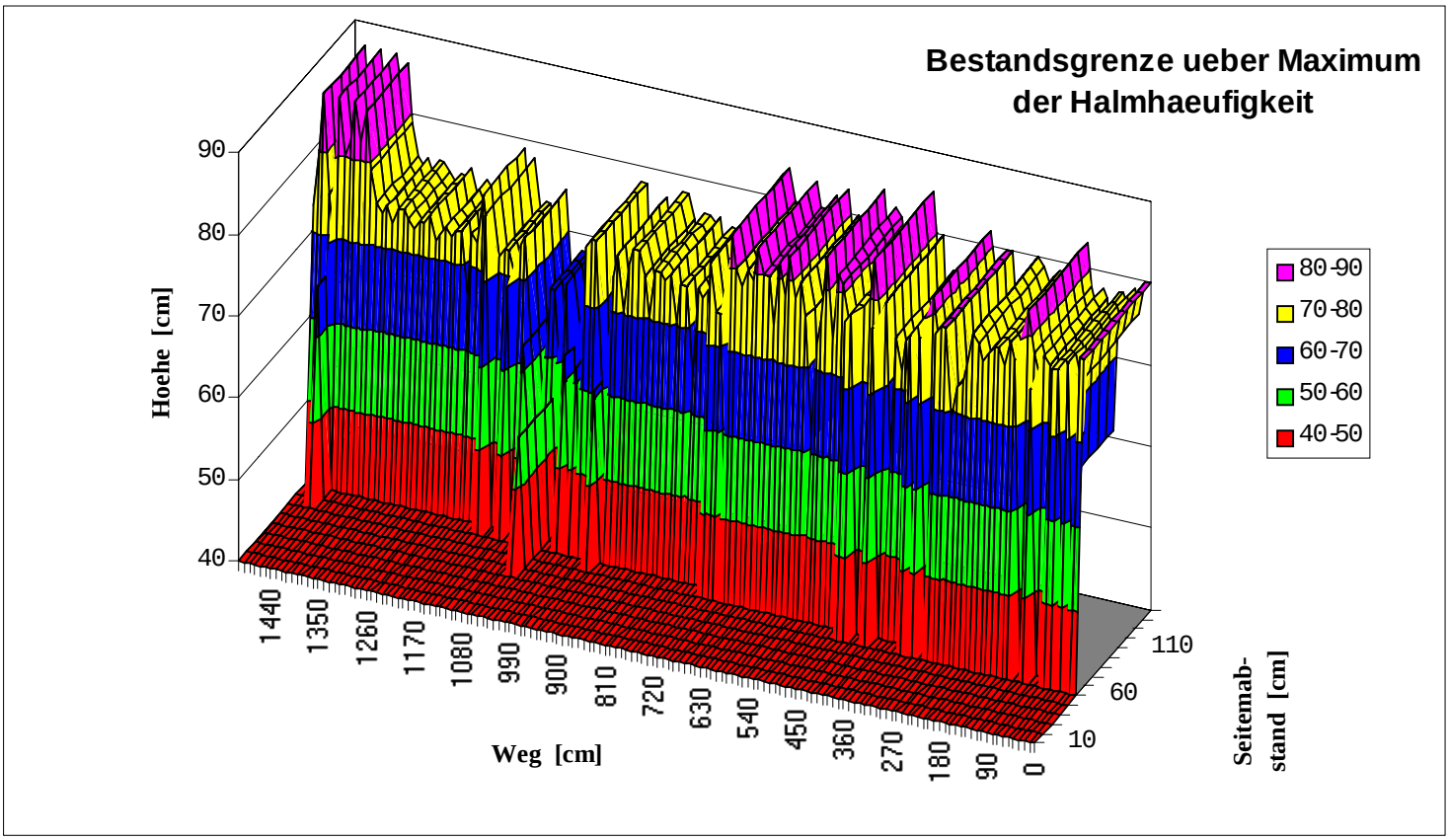


Test protocol



Computed grain stock

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