

Master's Project (MP, 5 ECTS)

Calibration of a novel method to characterize the block shape

Description

Kalenchuk et al. (2006) proposed a mathematical description of block shapes (BSCM) according to their elongation (β) and flatness (α). β and α are calculated with the inter-vertex ratios and the ratio between surface area and the block volume. The proposed method shall be used, to calibrate a novel approach. This approach fits ellipsoids into the block coordinates to determine their elongation. With this approach, a better description of both the elongation and the orientation of a block shall be given. To apply the novel method, its results have to be calibrated according to the BSCM by Kalenchuk et al. (2006), to define the ranges of the single shape classes with the novel elongation values.

The project shall use existing data from earlier master's theses as well as includes the generation of new block shapes with 3DEC. The following questions have to be elaborated:

- How does the novel value for β fit into the existing BSCM-plot?
- Where are the new ranges for the block shape classes in the BSCM-plot?

As an addition, the existing code can be edited, so that the fitted ellipsoids are bounded by the given point coordinates and shall not exceed their dimensions (over fitting).

Unless the additional task is elaborated, no prior knowledge, despite mathematics, is necessary.

Methodology

- Literature research block shape classification methods
- Establishment of different 3DEC models for the definition of the boundaries of the block shape classes according to Kalenchuk et al. (2006)
- Use of the determined 3DEC models to calibrate the novel algorithm
- Writing a technical report with the found results

Templates for the scientific report can be found on the institute's homepage. There is also a guideline for scientific writing free downloadable at the homepage, whose compliance is mandatory. The language for the report can either be in English or in German.

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Start by appointment

Duration ca. 125 h

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