

# Improving Newton Existence Test

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## Abstract

This talk proposes a review of some existence and uniqueness tests used in interval analysis (Newton and krawczyck like) [Moo79, Neu90, Han92]. This review will be upgraded with a method that improves Newton existence tests by choosing a better starting point. When we perform an existence test on a box, we generally have to compute Jacobian matrices of a given function  $f : \mathbb{R}^n \rightarrow \mathbb{R}^n$ . This matrices could be non-invertible and the larger is the starting box, the higher is the probability of non-invertibility. Methods such as  $\mathcal{E}$ -inflation has greatly improved results of this kind of tests but a serious drawback is the need of an inflation coefficient.  $\mathcal{N}$ -inflation is a new method that help us to perform an inflation without coefficient  $\mathcal{E}$  and with better results.

**Keywords.** Existence, Uniqueness, Newton, Interval Analysis.

## References

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