

Methods for Optimizing Solutions to Least Absolute Value Estimation

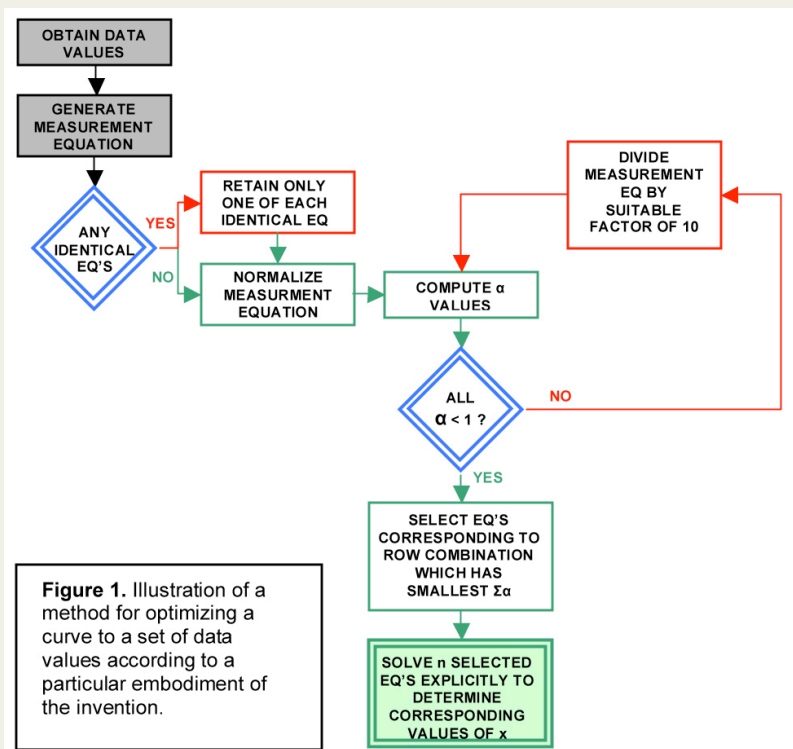
This invention relates to methods for fitting curves to sets of data points (e.g. experimentally determined data points). Particularly, this method enables the optimization of the least absolute value (LAV) problem-solving process.

The Problem

When analyzing experimentally obtained data, it is useful to conduct "curve fitting" in order to determine the relationship between the data values. However, the curve fitting process is typically an estimate and not an exact representation. One such example is the least squares cost function, for which there are a number of well-known problems. Some optimization techniques exist, but require a large number of iterations, are relatively non-robust to outlying data values, and are computationally expensive. The invention described herein provides a method for fitting a curve to a set of data values using the least absolute value (LAV) cost function. The measurement equation can be written as:

$$z = Hx + v,$$

where $H \in R_{m \times n}$ is of maximal rank.



Advantages

- Optimization using LAV estimation is preferred because it allows for rejection of outlying measurements;
- Does not require a large number of iterations and therefore is very efficient.

Applications

- Wireless communication systems;
- Mechanical, electrical, chemical and other engineered systems;
- Sets of independent variables and a corresponding dependent variable;
- Applied to experimentally acquired data or values obtained in any suitable manner.

Intellectual Property Status

US Provisional Patent No. 60/884367 filed February 5, 2007 by SFU (Christensen et al.)

Stage of Development

- Proof of concept demonstrated
- Exploring other applications

Requests

Available for further development or licensing (exclusive or non-exclusive) by jurisdiction and/or field of use.

Contact:

Elmer K. Sum, MSc., P.Eng
Technology Manager, Innovation &
TIME New Venture Incubation Centre
Tel: 778-782-7750
Email: elmers@sfu.ca