

# CAS 741: Problem Statement

## Scientific Data Processing

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Table 1: Revision History

| Date         | Developer(s)        | Change                     |
|--------------|---------------------|----------------------------|
| Sep 15, 2018 | Malavika Srinivasan | Problem statement creation |
| ...          | ...                 | ...                        |

Scientific Computation (SC) is the collection of tools, techniques, and theories that are required to solve problems in the field of science and engineering using computer-based mathematical models. The source data for scientific computation problems are usually [not usually - plenty of scientific computing problems are solved without data acquisition systems —SS] from a data acquisition system [There should be a comma befor which —SS] which is used for conducting experiments in a laboratory setup. The large set of data across the entire function (such as time and temperature) in an experiment is usually complex to analyze and require segmenting and curve-fitting.

The purpose of this software [say software family —SS] is to develop a general purpose tool [say library —SS] for fitting the experimental data across a 1D function to enable the data processing in a more simpler fashion. In other words, the software is intended to be used as a tool to fit the data and compute gradients. [say derivatives, gradient only refers to the first derivative —SS] In this software, regression and interpolation are the two techniques used for data fitting.

Interested stakeholders in this project may include researchers in industrial and academic set-up, students, technicians and those who deal with processing of a large set of data to obtain critical information within a dataset. The processing encoded into the current software will be suitable for any scientific application which will require scientific data processing like obtaining a fit for the data, interpolating across the domain and computing gradients. [same comment as above on gradients —SS] This software can be run on a variety of personal desktop and laptop computers using Linux, Windows, or MacOS.