

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
Sep 17, 2018	Spencer Smith	Corrections in problem statement
Sep 18, 2018	Malavika Srinivasan	Changes made in problem statement for corrections mentioned on Sep 17, 2018.
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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 before which —SS] [Yes Dr.Smith. I agree. Do you want me to change this sentence? —Malavika] [YES! —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 family[say software family —SS][correction made —Malavika] is to develop a general purpose library [say library —SS] [Correction made —Malavika]for fitting the experimental data across a 1D function to enable the data processing in a simpler fashion. In other words, the software is intended to be used as a tool to fit the data and compute derivatives. [say derivatives, gradient only refers to the first derivative —SS] [Yes, correction made —Malavika] 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 derivatives. [\[same comment as above on gradients —SS\]](#) [\[Changes made —Malavika\]](#) This software can be run on a variety of personal desktop and laptop computers using Linux, Windows, or MacOS.