

# Assignment 4 : Robust Regression for Curve Fitting

10 points

Due Date: November 14, 2021

## 1 Background

Robust regression is a type of regression analysis in robust statistics that is intended to overcome some of the limitations of traditional parametric and non-parametric methods. The goal of regression analysis is to determine the relationship between one or more independent variables and one or more dependent variables. Certain commonly used regression methods, such as ordinary least squares, have favourable properties when their underlying assumptions are true, but can produce misleading results when those assumptions are violated; thus, ordinary least squares is said to be not robust to assumptions violations.

Least squares estimates for regression models, in particular, are extremely sensitive to outliers. While no precise definition exists, outliers are observations that do not follow the pattern of the other observations. This is not normally a problem if the outlier is simply an extreme observation drawn from the tail of a normal distribution; however, if the outlier is the result of non-normal measurement error or some other violation of standard ordinary least squares assumptions, the validity of the regression results is jeopardised if a non-robust regression technique is used.

## 2 Problem Statement

To program a Polynomial Regressor, to fit the given data to their underlying polynomial equation using **RANSAC**. [Here is the colab file.](#)

## 3 Procedure

- Open the [colab file](#), and follow along the lines. The dataset downloading and some other utils have already been completed for you. You can start with running them.
- Before starting, go through the colab to understand the assignment in a better way.

- You have been provided with 3 sets of datasets, 1 each for 2nd, 3rd and 4th order polynomial for this assignment.
- You are required to complete the given code template and the other components that are present in the colab file.
- For any doubts, add your questions to the [FAQ document](#).

## 4 Deliverables

1. You are required to submit the completed colab file with the following file name **RollNo\_Assignment4.ipynb**
2. The marking scheme is labelled in the colab file it self.
3. Please submit only the colab file, i.e. no other report apart from the colab file is required.
4. Avoid any sort of malpractice and adhere to the institute's code of conduct.