# Notations

Spline Function

Abscissas Vector

Ordinates Vector

Knot Vector

Control Vector

Data Matrix

### Smoothness

Smoothness Matrix

A math equations on a white background

Description automatically generated

# LS Solutions

## 1D

### General LS Solution Proof

### LS Solution

## Clamped

Minimize s.t.

### Clamped - Unconstrained Approach

## Weighted

s.t.

(multiply each column of by element-wise)

## Weighted Clamped

## Choosing Knot Vector

1. Uniform Vector
2. Proportional to distance as in paper

## 2D

Given

Construct according to scheme in paper:

Separate 1D solutions for

# Curvature Fixing Algorithm

Given path :

1. Construct clamped smooth B spline with midway points and set new s.t. (total control points  
   Implementation details below
2. Follow 2-peak solution scheme

Same solution, just with :

### Enforce Clamping

sually