Software Requirements Specification

Speed Bump ML

**ــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ**

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## Document Status:

|  |  |  |
| --- | --- | --- |
| **Name** | PO\_SB\_SRS\_ML | |
| **Version** | V1.0 | |
| **Status** | proposed | |
| **Author** | AA | |
| **Date** | [5-2-2023] | |
| **Team Approval** |  |  |
| **Mentor Approval** |  |  |
| **Final Approval** |  |  |

## Document History:

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Author** | **Date** | **Change** |
| V1.0 | SS | [13-1-2023] | Initial Creation ,  Adding System context |
| V1.0 | AA | [5-2-2023] | Adding requirements: PO\_SB\_SRS\_PreprocessingClass\_**001**-V1.0  PO\_SB\_SRS\_BumpDetectionModel\_**002**-V1.0  PO\_SB\_SRS\_DistanceAlgorithm\_**003**-V1.0  PO\_SB\_SRS\_Bump\_Detection\_Class\_**004**-V1.0 |
|  |  |  |  |

## Reference Document:

|  |  |  |  |
| --- | --- | --- | --- |
| **Ref.number** | **Doc.Name** | **Version** | **Status** |
| 1 | PO\_SB\_CRS\_ML | V1.2 | Released |

## Project Description:

### Definition:

A Deep learning model that detects the speed bumps on the road and estimates the distance between the car and the bump.

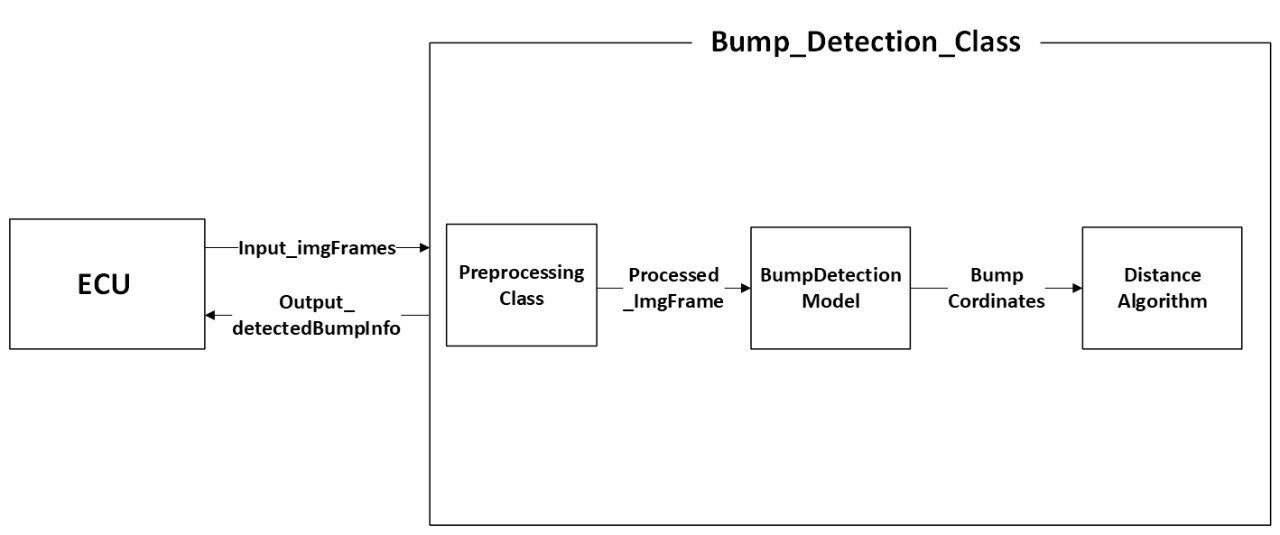
### Features:

* Model that detects speed bumps on road.
* Estimate the distance between vehicle and bump.

### Key elements

* The deep learning model shall contain algorithms for data mining.
* The deep learning model shall detect speed bumps using neural network
* The distance between the car and the bump shall be estimated.

## Software context:



## SRS Requirements:

|  |  |  |  |
| --- | --- | --- | --- |
| **Req\_ID** | PO\_SB\_SRS\_PreprocessingClass\_**001**-V1.0 | **Covers** | PO\_SB\_CRS\_*001*-V1.2 |
| **Description** | The bump detection class received the Input\_imgFrames from the ECU and preprocess it | | |
| **Inputs** | Input\_imgFrames | **Outputs** | Processed\_ImgFrame |

|  |  |  |  |
| --- | --- | --- | --- |
| **Req\_ID** | PO\_SB\_SRS\_BumpDetectionModel\_**002**-V1.0 | **Covers** | PO\_SB\_CRS\_**002**-V1.2 |
| **Description** | The Processed\_ImgFrame get resized and get in the BumpDetectionModel and the model generate the coordinates of the bump | | |
| **Inputs** | Processed\_ImgFrame | **Outputs** | Bump\_coordinates |

|  |  |  |  |
| --- | --- | --- | --- |
| **Req\_ID** | PO\_SB\_SRS\_DistanceAlgorithm\_**003**-V1.0 | **Covers** | PO\_SB\_CRS\_**003**-V1.2 |
| **Description** | The Bump\_coordinates get in the DistanceAlgorithm and calculate the distance between the bump and the car | | |
| **Inputs** | Bump\_coordinates | **Outputs** | Output\_detectedBumpInfo |

|  |  |  |  |
| --- | --- | --- | --- |
| **Req\_ID** | PO\_SB\_SRS\_Bump\_Detection\_Class\_**004**-V1.0 | **Covers** | PO\_SB\_CRS\_**004**-V1.1 |
| **Description** | The Output\_detectedBumpInfo get into ECU | | |
| **Inputs** | Output\_detectedBumpInfo | **Outputs** | ----- |