## Customer Requirements Speciﬁcation

**PO\_ٍSAG\_CRS\_ML\_TR ـــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ**

**Table of Contents**

[Document Status](#_heading=h.gjdgxs) 1

[Document History](#_heading=h.30j0zll) 1

[Reference Document](#_heading=h.1fob9te) 2

[Project Description](#_heading=h.3znysh7) 3

# Document Status:

|  |  |  |
| --- | --- | --- |
| **Name** | PO\_ٍSAG\_CRS\_ML\_TR | |
| Version | V1.0 | |
| Status | proposed | |
| Author | aya | |
| Date | [8-11-2022] | |
| Team approval |  |  |
| Mnetor approval |  |  |
| Final approval |  |  |

# Document History:

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Author** | **Date** | **Change** |
| 1.0 | Aya | [8-11-2022] | * Initial Creation * Add definition * Add features * Add Key elements * Add System Context * Add CRS Requirements |

# Reference Document:

|  |  |  |  |
| --- | --- | --- | --- |
| **Ref.number** | **Doc.Name** | **Version** | **Status** |
| 1 | PO\_SAG\_CR\_ML | V1.1 | Released |

# Project Description:

## Definition:

The project aims to help the blind using computer vision to help them identify different things around them and NLP to interact with the user using voice commands.

The project simulates the natural vision of humans using AI techniques enabling the blind to function more normally and independently.

## Features:

* Object detection
* Face recognition
* Activity recognition
* Text recognition
* Speech recognition

## Key Elements:

* The model shall edit the dimensions of each image.
* The model shall encode each character of a word into some numerical value
* The model shall be a hybrid model of CNN and Bidirectional-LSTM.
* The CNN part of the mode shall process each of the segmented images to extract the feature map.
* The Bidirectional-LSTM part of the model shall take the feature maps from the CNN layer which outputs SoftMax probabilities over the vocabulary.
* The CTC decoder shall take these probabilities from different time steps to finally get the raw text from images.
* Output formatter shall format the text output to Output Formatter.
* The model shall return the output to ECU.

## **Text Recognition**

## System Context:

Diagram

Description automatically generated



## CRS Requirements:

|  |  |  |  |
| --- | --- | --- | --- |
| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***001***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | The model shall edit the dimensions of each image. | | |

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| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***002***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | The model shall encode each character of a word into some numerical value | | |

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| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***003***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | The model shall be a hybrid model of CNN and Bidirectional-LSTM. | | |

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| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***004***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | The CNN part of the mode shall process each of the segmented images to extract the feature map. | | |

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| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***005***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | The Bidirectional-LSTM part of the model shall take the feature maps from the CNN layer which outputs SoftMax probabilities over the vocabulary. | | |

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| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***006***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | The CTC decoder shall take these probabilities from different time steps to finally get the raw text from images. | | |

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| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***007***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | Output formatter shall format the text output to Output Formatter. | | |

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| **Req\_ID** | Req\_PO\_SAG\_CRS\_ML\_TR\_***008***-V1.0 | **Covers** | PO\_SAG\_CR\_ML\_004-V1.1 |
| **Description** | The model shall return the output to ECU. | | |