

## Liste of figure

<b>Figure 1.1</b> the first best saved license plate. ....	5
<b>Figure 1.2</b> license plate of some European countries .....	7
<b>Figure 1.3</b> the 10 serial numbers of License plate Algeria .....	9
<b>Figure 1.4</b> (On the left) registration plate before 1976, (On the right) registration plate after the 1976 .....	10
<b>Figure 1.5</b> Current passenger series, front plate in black on white (On the left). rear plate in black on yellow (On the right).....	11
<b>Figure 1.6</b> Diplomatic series in black on green. The Registration consists of the letters CMD, Followed by two numerals and one numeral.....	12
<b>Figure 1.7</b> Diplomatic series, front plate in black on white.....	13
<b>Figure 2. 1</b> Steps of ANPR System .....	17
<b>Figure 2.2</b> Input image (Captured image through own camera).....	18
<b>Figure 2.3</b> Grays Cal Image .....	18
<b>Figure 2.4</b> Binary Image Using Otsu's Method .....	19
<b>Figure 2.5</b> edge Sobel Image .....	21
<b>Figure 2.6</b> (a) Original Image (b) Vertical Edge Map (c) Rank Filtered Image (d) Vertical Projection [7].....	22
<b>Figure 2.7</b> The various stages in the segmentation process. (D) The license plate after global thresholding.....	24
<b>Figure 2.8</b> Flow chart of character segmentation .....	28
<b>Figure 2.9</b> Principle of SVM .....	29
<b>Figure 2.10</b> Example of a neural network .....	30
<b>Figure 2.11</b> the Template of characters. ....	31
<b>Figure 3.1</b> The hyperplan H that separates the two sets of points.....	41
<b>Figure 3.2</b> the optimal hyperplan H, and support vector maximum margin.....	42
<b>Figure 3.3</b> Best separating hyperplan. ....	43
<b>Figure 3.4</b> Transformation of the data in a large dimension space.....	44
<b>Figure 3.5</b> (left) Scatter 3 classes: one approach against all , (right) System Architecture Strategy A-against-all. ....	45
<b>Figure 3.6</b> (left) Scatter 3 classes: one against one approach, (right) System Architecture Strategy A-against-A.....	46
<b>Figure 4.1</b> the Matlab 2014b interface.....	50
<b>Figure 4.2</b> Structure of the implemented system. ....	51
<b>Figure 4.3</b> Input images (Captured image through own camera) .....	52
<b>Figure 4.4</b> Some exempls of digit Images of databases used , (a )binary digit Images, (b) grays cal digit Images) .....	53

<b>Figure 4.5</b> the preprocessing flow chart of vehicle image .....	5
<b>Figure 4.6</b> example Convert original images to grayscale images.....	55
<b>Figure 4.7</b> example Convert original images to edge images.....	58
<b>Figure 4.8</b> Edge Horizontal Histogram.....	62
<b>Figure 4.9</b> The height variability of a tested segment.....	64
<b>Figure 4.10</b> Masked plate .....	65
<b>Figure 4.11</b> Morphology (Dilation Vertical) and Morphology (Dilation Horizontal) .....	66
<b>Figure 4.12</b> The Joint Places. ....	66
<b>Figure 4.13</b> Dilation of joint place .....	67
<b>Figure 4.14</b> the result of erosion. ....	67
<b>Figure 4.15</b> plate isolation. ....	68
<b>Figure 4.16</b> example of convert original license plate to image gray scale.....	69
<b>Figure 4.17</b> vertical and horizontal scanning of license plate. ....	70
<b>Figure 4.18</b> example of character segmentation .....	70
<b>Figure 4.19</b> Normalization of digit "3" .....	71
<b>Figure 4.20</b> some results of Hu Invariant Moments.....	72
<b>Figure 4.21</b> some result of LBP for digit images grays Cal.....	73
<b>Figure 4.22</b> graphic of recognition rate by class.....	76
<b>Figure 4.23</b> global recognition rate .....	76
<b>Figure 4.24</b> graphic of the recognition rate by class. ....	78
<b>Figure 4.25</b> graphic of global recognition rate .....	78
<b>Figure 4.26</b> graphic of recognition rate.....	79
<b>Figure 4.27</b> the Main interface. ....	80
<b>Figure 4.28</b> location plate.....	81
<b>Figure 4.29</b> interface of character segmentation step.....	81