**VistGAN: Unsupervised VSR solution for Smart Carpark**

**Application**
A novel Video Super-Resolution (VSR) approach to retrieve high-resolution details from low-resolution video. The AI enabled solution can achieve one-to-many car plate recognition simultaneously, which is a cost saving solution to smart parking management system.

Application area:
- Indoor Carpark – car plate recognition and way guiding
- Outdoor Carpark – smart cities for parking space enquiry

**Technology**
VistGAN – an unsupervised video super-resolution technique which reconstructions a high-resolution video sequence of frames from a low-resolution video sequence of frames. The reconstruction makes use of a video super-resolution approach with temporal consistency using Generative Adversarial Networks (GAN), an unsupervised learning mode, and a metric learning model in its discriminator which maps degradation operations of the low-resolution frames.

**Advantages**
- Higher video quality up to 26.78 Peak SNR
- Reduce CAPEX on hardware installation (10 camera into 1)
- Flexible installation for public parking area
- AI model and OCR running on the IoT edge (Future)

<table>
<thead>
<tr>
<th>Method</th>
<th>Bicubic</th>
<th>VSRnet</th>
<th>VESCPN</th>
<th>DRVSR</th>
<th>TDVSR</th>
<th>FRVSR</th>
<th>HFENet (ours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSNR</td>
<td>23.53</td>
<td>24.84</td>
<td>25.35</td>
<td>25.87</td>
<td>25.49</td>
<td>26.17</td>
<td>26.78</td>
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<td>SSIM</td>
<td>0.628</td>
<td>0.702</td>
<td>0.756</td>
<td>0.772</td>
<td>0.746</td>
<td>0.798</td>
<td>0.821</td>
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<tr>
<td>FWE(10^{-4})</td>
<td>3.72</td>
<td>6.94</td>
<td>5.42</td>
<td>5.24</td>
<td>5.03</td>
<td>4.53</td>
<td>3.92</td>
</tr>
</tbody>
</table>

Achieve high PSNR compare to other algorithm for high definition video with temporal consistency.

**Talk to Us**
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**Intellectual Properties**
US Provisional Application: 63/100272

TTC References: TTC.PA.1321