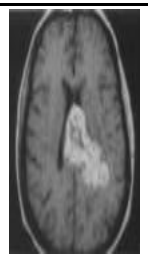
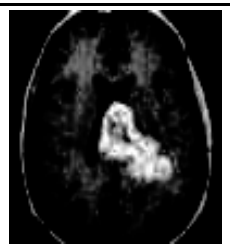
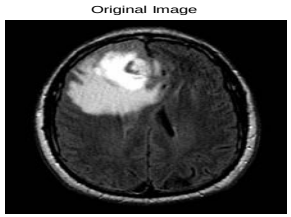
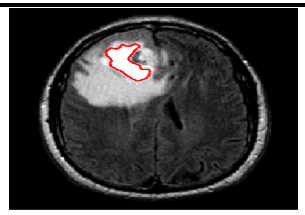
Product Development

Product development is the process of designing, creating and marketing new products or rendering services to benefit the customers. Faculty members have involved in development.

<table>
<tr><th>Sl. No</th><th>Name of the Module / Project</th><th>Team Members</th><th>Results</th></tr>
<tr><td rowspan="2">1.</td><td>Pre-processing Techniques applied to MRI images of Brain</td><td>Virupakshappa Research Module</td><td rowspan="2"><table><tr><td>  </td><td>  </td><td>  </td><td>  </td></tr><tr><td>Original Test Sample</td><td>Intensity Mapped Image</td><td>Skull Stripped Image</td><td>Histogram Equalized Image</td></tr></table></td></tr>
<tr><td colspan="2">Module Description Various Preprocessing techniques such as Intensity Mapping, Skull stripping, Histogram Equalization Median Filtering have been experimented with MRI images of brain.</td></tr>
<tr><td>2.</td><td>A new approach of brain tumor segmentation using fast convergence level set</td><td>Virupakshappa Research Module</td><td><table><tr><td>  </td><td>  </td></tr><tr><td>Original Test Sample</td><td>Bounding Region Marked for the</td></tr></table></td></tr>
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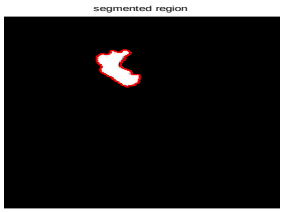
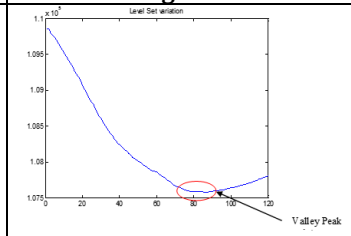
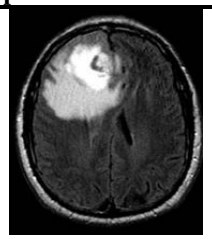
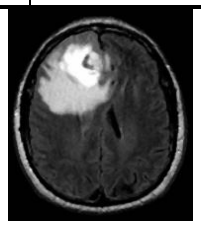
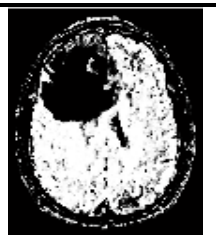
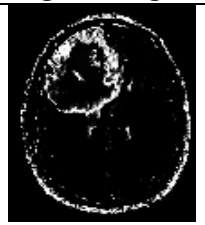
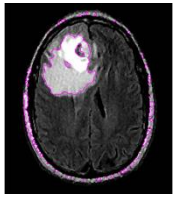
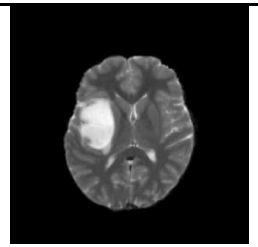
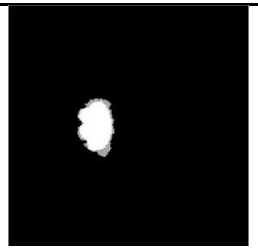
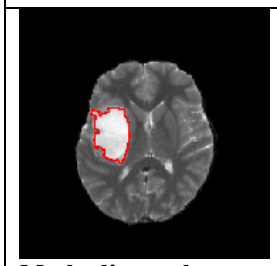
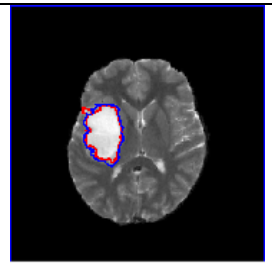
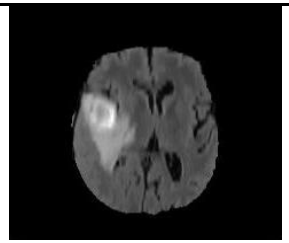
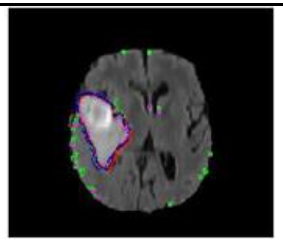
	Module Description In this Module, an enhanced approach of region segmentation using level set (LS) method is proposed, which is achieved by using cross over point in the valley point as a new dynamic stopping criterion in the level set segmentation.		**tumorous region.**  **Segmented Tumor Region from the MRI sample**  **Valley peak point in a Level Set evolution.**
3.	An Approach of using Spatial Fuzzy and Level Set Method for Brain Tumor Segmentation	Virupakshappa Research Module	 **(a) Original Image**  **(b) Filtered Image**  **(c) Cluster image 1**  **(d) Cluster image 2**  **(e) Cluster image 3**  **(f) Cluster image 4**  **(g) Selected Cluster**  **(h) Segmented Image**  **(i) Tumor Region**
	This module is implementation of hybrid clustering technique obtained by combining two efficient clustering techniques namely level set and fuzzy c means, from the fuzzy c-means clustering technique, it will be comparatively easy to estimate the segmentation level by controlling parameters, this is effectively achieved by combining both the algorithm to form spatial fuzzy clustering techniques.		

<table>
<tr><td>4.</td><td>Brain MRI Segmentation using Initial Contour KPCM and Optimal Speed Function for Improved Level Set method</td><td>Virupakshappa Research Module</td><td rowspan="2"><table><tr><td> 
Input Image</td><td> 
Ground Truth (GT) from BRATS 2015</td></tr><tr><td> 
Method’s result</td><td> 
GT + Methods result combined</td></tr></table></td></tr>
<tr><td colspan="3">Module Description A novel segmentation method based on Particle Swarm Optimization (PSO) and rejection of outliers combined with level set method is developed. With the assistance of PSO method the cluster centers are selected ideally and the subsequent fuzzy clustering is utilized to specify an initial level set counter in the proposed improved level set based segmentation.</td></tr>
<tr><td>5.</td><td>Cognition based MRI brain tumor segmentation technique using modified level set method</td><td>Virupakshappa Research Module</td><td><table><tr><td> 
Input Image</td><td> 
GT + Methods result combined</td></tr></table></td></tr>
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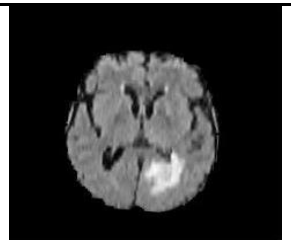
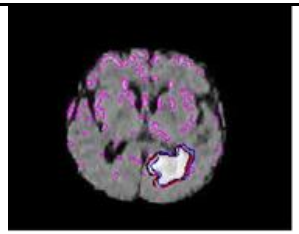
<table>
<tr><td></td><td colspan="2">Module Description This Module presents an innovative level set algorithm for segmenting gliomas from the MRI brain images where the segmentation is made automatically by means of selecting the initial contour automatically from the maximum intensity pixel computed from the histogram intensity plots.</td><td> 
Input Image
 
GT + Methods result combined</td></tr>
<tr><td>Sl. No</td><td>Name of the Module / Project</td><td>Team Members</td><td>Results</td></tr>
<tr><td>6.</td><td>Preprocessing Techniques applied to Ultrasound images of Liver Tumour</td><td>Deepak S Uplaonkar
Research Module</td><td rowspan="2"> 
Input Image
 
Resized Image
 
Median Filtered Output
 
Wiener Filtered Output
 
HNF Output</td></tr>
<tr><td colspan="2">Module Description In this work, the output of median and wiener filter is applied to neural network as input to produce better outcome such as enhancing the image. At first stage ultrasound image is applied to median filter and wiener filter. At second stage the output from both will be applied to neural network and by reducing the MSE the enhanced image will be obtained</td></tr>
</table>

Sl. No	Name of the Module / Project	Team Members	**Results**
7.	**Corona Virus (Covid 19) Disinfectant on surfaces**	Akshay.S. Aspalli, Asst. Prof, Dept. of EEE, PDACE, Kalaburgi akshay.aspalli@pdaengg.com	Coronaviruses are members of the Coronaviridae group and contain a single-stranded, positive-sense RNA genome surrounded by a corona-like helical envelope (Ryan 1994). Approximately 100 sequences of the SARS-CoV-2 genome have been published and these suggest there are two types, Type I and Type II, of which the latter came from the Huanan market in China while the Type I strain came from an unknown location (Zhang 2020). The genome consists of 29,751 base pairs (NC_045512.2) and the genome is about 80% homologous with SARS viruses (NCBI 2020, Fisher 2020). Coronaviruses have a size range of 60-140nm, with a mean size of 0.10 microns (Zhu 2020). 
8.	**Illumination intensity based Street Lamp**	Dr.Sangamesh Sakri	An automatic switch is to operate lamps which are in accessible and remote. This works on the principle that when light falls on a particular point, the lamp goes OFF otherwise it will be ON. The settings are adjusted such a wary that the morning sun light should switch OFF the lamp and in the evening the darkness should switch ON the lamp. The circuit mainly anises of LDR and relays, the LDR is set to certain light wave length and the switch gets operated through relay. The units were tested for 3 months and were found to be satisfactory.

9.	**Contactless Sensor Based hand Sanitizer**	Sri.Kashayya	In the wake of COVID 19 pandemic, this unit was developed. Here the UV light capability for sterilising certain surfaces was considered. This unit is in the style of a reading lamp, where the reading lamp replaced by an appropriate UV lamp set. The object like mobile phone Purses, currency notes, coins etc are to be placed below the lamp for 5-10 seconds, and they get sterilised. The unit is found to be effective and useful and there is a demand for it.
10.	**Regulated Power Supply**	Smt.Mahadevi Biradar	As Electricity is most important requirement in daily life and electricity should be adequate and reliable. So, we need to automate the transfer operation of electric power distribution. This automatic operation will automatically have switched from one power source to another power source during certain failures. As some electrical devices needs continuous power supply and which are highly sensitive, such devices can be offered with the interruption of power supply. So to avoid such problems caused due to interruption of power supply, it is proposed to take power from different sources and alternate between them.
11	**Rectifier**	Sri. Nagabhushan Patil	Students have developed a rectifier in the lab using 230/30v AC transformer, BY127 diodes, 10ohms resistor and 0.1µF capacitor as filter.