**Research Module**

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| **Module** | **Task** |
| **Evaluate Object Detection and Classification Modules** | In this module, we have evaluated the different object detection and classification modules. We have examined traditional and latest computer vision and machine learning techniques. Then based on the research gap, we have developed the efficient and accurate object detection and classification module. |
| **Person Detection and Classification** | In this module, we have examined our developed object detection and classification module with respect to the person detection and classification. We have gathered dataset from different sources and then trained it on our defined algorithms using the fine-tuned parameters. |
| **Rack Opening and Closing** | In this module, the system is trained on the self-generated dataset of rack opening and closing. We have mould our developed object detection and classification algorithm with respect to the rack opening and closing detection. |
| **Defining Suspicious Boundary Areas** | In this module, our research team focused on the developing the algorithms, which helps to identify the boundary area based on the specified locations. |

**Hardware Development Module**

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| **Module** | **Task** |
| **Transfer on Embedded** | In this module, we have optimized our developed object detection and classification algorithm on to the node. We transfer our whole code on to the node processor by using different optimization techniques, and making sure that efficiency of the algorithm increased without effecting the accuracy. |
| **Database Integration with Embedded** | In this module, we have integrated our developed optimized object detection and classification module with the databases. We have stored screen shots, and 3-5 seconds video of any suspicious activity happened over there. |
| **Connectivity with Cloud Server** | In this module, we have connected our whole solution with cloud server. |
| **Circuit development and Boxing** | In this module, we prepared our intelligent box in which we put our processor on which the code is run. Further, we have put all necessary circuits on it. Finally, we print the box using the 3D printer on which the whole device is placed. |

**Mobile Applications and Web Portal**