My Bachelor Thesis titled "Implementation of Hazardous Chemical Detection using Unmanned Aerial Vehicle" is a project done in collaboration with two teams of graduate students also by a defense research institution in my city (Bhimasena). This thesis is done as part of a 3 years joint research between my University and Bhimasena, with the objective of developing a UAV with capability to augment military personnel in detecting chemical contamination in war zone. Our team's goal is to develop a proof of concept of using a stable UAV to survey a certain region to detect its chemical contamination level. To do so, The process can be divided into three parts; interfacing with sensor, developing GUI for operator, and conducting pre-flight tuning and HILS to assure the control of the UAV.

Interfacing the sensor is done using a Raspberry Pi over serial communication using python. This data will be transmitted along with other data in Mavlink protocol. Thus using MavRos as the interface.
While the GUI is developed by adopting QGroundControl in Qt to assure cross-platforming, while adding area survey generator and data visualization in 3D for sensor data. Lastly the HILS (Hardware-in-the-Loop-Simulator) is done in Matlab and then JMavSim.