**RESULTS AND SUMMARY**

We started our project with a goal to find a solution for disaster management using drones. Initially we concentrated mainly on the simulation part of the drones. We were a part of 10 teams working on the same problem. Our goal was to take care of the multi drone simulation.

We started with single drone simulation. Our initial attempt was made using jMAVSim and Dronecode. As it turned out jMAVSim with its limited capabilites could not meet all the requirements. Dronecode on the other hand did not support multi-drone simulation and smooth inter communication with simulator.

So we changed our line of attack with Gazebo and ROS. Gazebo with its powerful 3D simulation environment for autonomous robots and its superior capability in testing object-avoidance along with computer mission helped us meet the goal. ROS with its impressive toolkit made controlling drones a very mundane matter.

ROS with with its MAVROS package helped us using MAVLink protocol which is the standard protocol for drones. Its other package cv\_bridge made it very easy for us for object detectiom as it linked the ROS library with OpenCV library.

We successfully implemented multi-drone simulation, receiving missions from other teams and simulating the same. We also had provided capabilty to dynamically accept mission waypoints on the go. The NOKIA team was very impressed by our work.

We continued our interest in drones by simulating another application where we search for objects lost in a simulated world. We created missions for each drones, attached cameras to each of them thus enabling vision to our drones. With this new capability drones used image processing to detect objects.

So in our project there was inter-working of lot of libraries together. Simulation was done using Gazebo, flight hardware using PX4, drone control using ROS, MAVLink protocol using MAVROS and image processing using OpenCV. All the coding was done in python. The most challenging work was installation of these softwares. The online support for PX4 was very minimum and itself was very new on the net. Multi-drone simulation happened after lots of hardwork, all the problems had to be figured out by us as we didnt have any pioneer in this field.

Our work on simulation is on par with real hardware implementation as all the protocols used in our project are used in real world. We look forward to implement the same on real drones and hope to see a worl full of drones.