

Risk-aware path planning based on digital map class classification for unmanned aerial vehicles

*Jun-Ho Choi¹⁾, Sung-Wook Jung²⁾, Won-ho Song³⁾ and Hyun Myung¹⁾⁴⁾

¹⁾ *The Robotics Program, KAIST, Daejeon, 34141, South Korea*

¹⁾ cjh6685kr@kaist.ac.kr

^{2),3),4)} *Department of Electrical Engineering, KAIST, Daejeon, 34141, South Korea*

²⁾ sungwook87@kaist.ac.kr, ³⁾ sw4613@kaist.ac.kr,

⁴⁾ hmyung@kaist.ac.kr

ABSTRACT

Unmanned Aerial Vehicles (UAVs) have two considerable problems. Due to being able to carry only limited payload, they can fly limited distance at one time. Additionally, if a UAV accident occurs due to collision or GPS problem, it may cause a secondary damage somewhere on the ground. There are a lot of high buildings and complex constructions in urban area, so accidents are more likely to occur while the risk of secondary damage becomes even higher when the accident occurs in urban areas. In this paper, a path planning algorithm is proposed which consider two elements, total fly distance and accident risk. To reduce the risk of accident, the digital map is used which is provided by the government. The components in the digital map are classified into several classes such as buildings, roads, and lakes. In this paper, buildings and apartments classes are considered because these two classes have high height. The goal is to generate a path that takes into consideration the total distance or the accident risk.

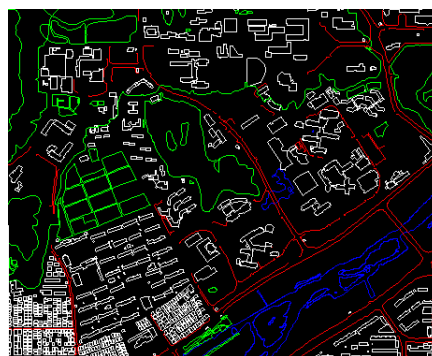


Fig. 1 Modified HD map describing only the classes to be used

^{1), 2), 3)} Graduate Student

⁴⁾ Professor