**Infantry Supply Station Design for DJI Robomasters Competition**

BY:

Rahmat Saeedi, Xinru Song, YiFeng Wang, & Yuyong Yao

Electrical and Computer Engineering, University of Alberta,

116 Street and 85 Avenue, Edmonton, AB, Canada T6G 2R3

FOR:

**University of Alberta RoboMaster Student Group**

Vincent Zhou & Terry Hong

ECE Student Groups

University of Alberta

116 Street and 85 Avenue, Edmonton, AB, Canada T6G 2R3

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# Introduction

DJI RoboMasters competition, is an annual robotics competition for postsecondary students across the globe that is intended to offer a platform to promote exchange and dialog among researcher and students alike. This global tournament is sponsored by SZ DJI Technology Co. LTD, and hosted by Communist Youth League of China, Secretariat of All-China Students’ Federation, and Shenzhen Municipal Government. To promote a fair and balanced competition platform, a set of annually updated competition rules are provided by the organizers of the contest, i.e. Technology Innovation Committee of Nanshan District Government of Shenzhen Municipality. The competition uses a range of robots, including Aerial, Base, Hero, Standard, and Engineering robots, each of which must satisfy a certain set of requirements. During the competition robots are able to fire bullets of standardized size at a Referee System carried on the sides of the robots. Robots are equipped by HD cameras and are controlled wirelessly from a different control room. Robots are able to refuel their ammunition anytime during the game at a stationary Supply Station that collects limited bullets distributed to teams at fixed intervals during the game. Eight hundred bullets of 2.6 g (±5%), plastic (TPE 90), of diameter 17 mm (-3% to 0%) are released in total during the game; 200 bullets initially, 300 bullets at 2 minutes 30 seconds mark, and 300 bullets at 5 minutes mark. A Base robot may also be refueled by an Engineering or Hero robots, while the Hero robot may be also refueled by Engineering or Arial robots. Engineering robot collects ammunition from the battle ground while Aerial robot gathers ammo from a resource column, tarmac, Hero, or Engineering robot.

University of Alberta’s RoboMasters Student group competed for the first time in 2017 and is planning to compete again in 2018. Previously, they used a mechanically activated supply station that resulted in wasted ammunition and clump

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| Robot | Quantity | Function | Bullet Supply Method |
| Base Robot | 1 | Automatic Self-Defense Robot | Initial 300 bullet |
| Hero Robot | 1 | Has high offensive power | Refueling Station  Engineering Robot  Resource Island  Aerial Robot |
| Engineering Robot | 0-1 | Assistant Robot, heals and gathering ammo from battle field |  |
| Standard Robot | 0-3 | Fight flexibility | Refueling Station  Engineering Robot  Resource Island  Hero Robot |
| Aerial Robot | 0-1 | Supplies aerial support, may help in refueling, and may occupy healing columns | Tarmac  Resource Column  Engineering Robot  Hero Robot |
| Refueling Station | 1 | Ammunition supply station, collects ammunition, and automatically dispenses ammunition |  |

# Project Constrains

Is this