



산봉우리 수호자

HERO

(High-altitude Emergency Response Operator)

목 차



Modeling



Video



Introduction



DMU



Q&A

○ HERO (High-altitude emergency response operator) ○

01

Introduction

팀원 소개 및 역할 분담



이상훈

PART DESIGN , GSD

- Motors
- Leg Brackets

DMU Kinematics

Video



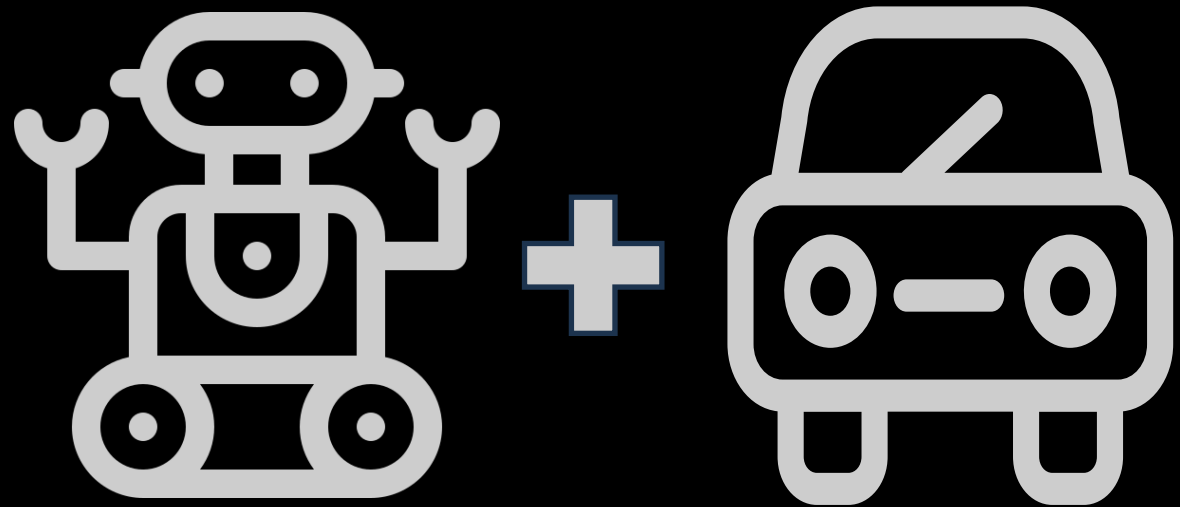
조문영

PART DESIGN, GSD

- Payload
- Frame
- Tire & rim
- UAM Assembly

PPT

주제 선정



POINT 01 Robotics + Automotive Engineering(+AI)

POINT 02 Social Responsibility



Hyundai TIGER X-1

프로젝트 이름 선정

As a CAD project, I'm going to make a high-altitude robot based on the TIGER X-1 of Hyundai, but please recommend a name for the project. Abbreviations come out as commonly used English words.



Sure, here are some name suggestions for your high-altitude robot project based on the TIGER X-1 of Hyundai. Each name is an abbreviation that forms a commonly used English word:

1. **SWIFT** - "Swift With Intelligent Fast Tactics"
2. **RANGER** - "Rescue And Navigation Ground Emergency Robot"
3. **GUARD** - "Ground Utility and Rescue Device"
4. **SPARK** - "Specialized Protection and Rescue Kit"
5. **HERO** - "High-Altitude Rescue Operator"
6. **SCOUT** - "Search and Climb Operations Utility Tool"
7. **VIGIL** - "Versatile Intelligent Ground and Integrated Lifesaver"
8. **PEAK** - "Precision Elevation Assistance Kit"
9. **ASCENT** - "Automated Search Climber for Emergency and Navigation Tasks"
10. **ALTOS** - "Automated Lifesaving Tactical Operations System"

These names aim to reflect the high-altitude capabilities and rescue functions of your robot while being easy to remember and pronounce.



POINT 01 Simple

POINT 02 Wordplay

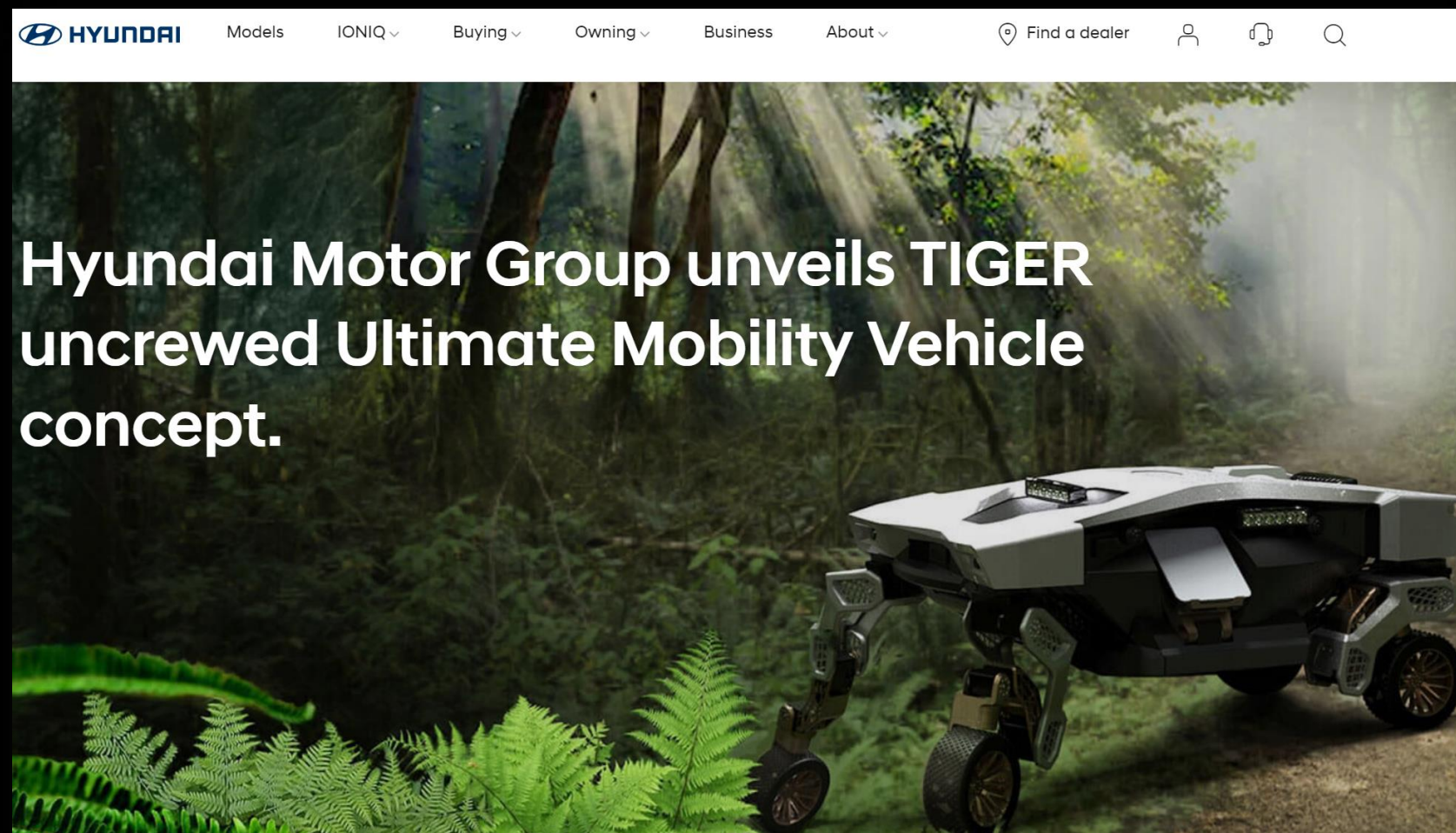
HERO

○ HERO (High-altitude emergency response operator) ○

02

Modeling

자료조사



그럼 xy 평면에서의 방향을 바꿀때는 스텝모터, 관절에는 서보모터, 바퀴에는 BLDC모터 괜찮을까?



현대 타이거 X-1과 같은 복합적인 로봇 시스템에서 각각의 모터를 특정 용도에 맞게 사용하는 것은 매우 합리적입니다. 각 모터의 특성과 장점을 고려하여 다음과 같은 방식으로 배치하는 것은 매우 적절합니다:

1. XY 평면에서의 방향 전환 - 스텝 모터:

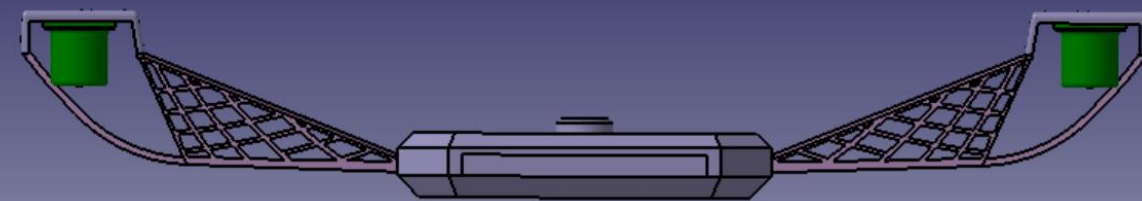
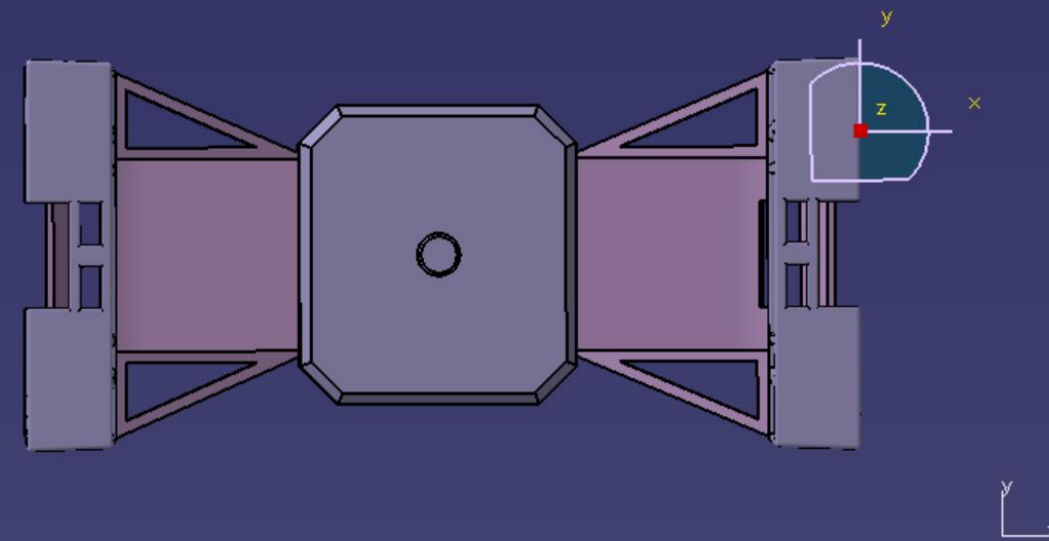
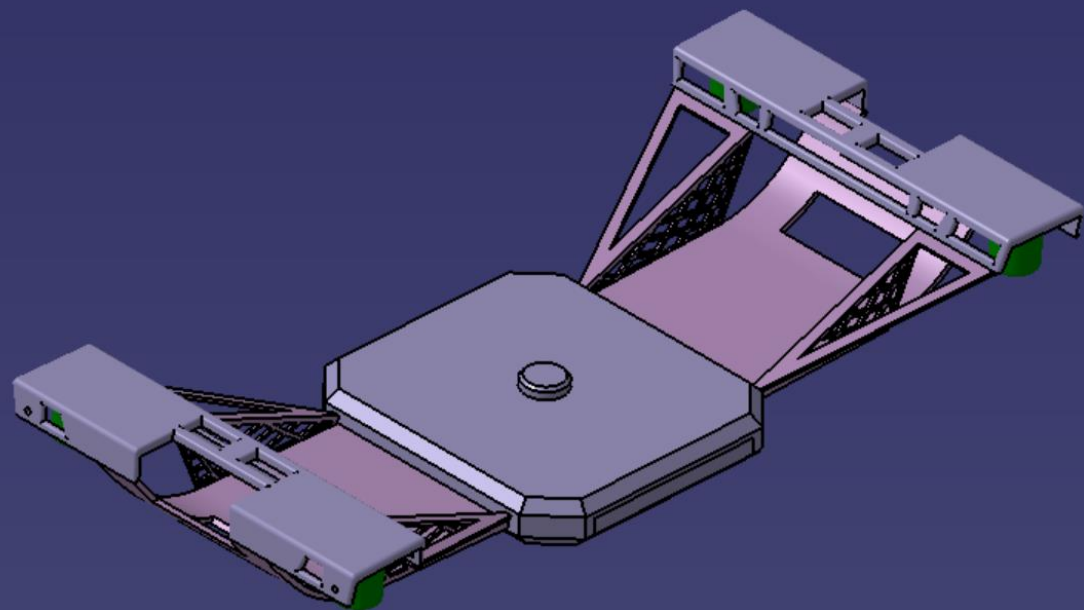
- **이유:** 스텝 모터는 각 스텝이 일정한 각도로 회전하여 정밀한 위치 제어가 가능합니다. XY 평면에서의 방향 전환은 주로 각도와 위치의 정확한 제어가 필요하므로 스텝 모터가 적합합니다.
- **장점:** 정밀한 제어, 개방형 루프 제어로 추가적인 피드백 시스템이 필요 없음, 저속에서 높은 토크 유지.

2. 관절 - 서보 모터:

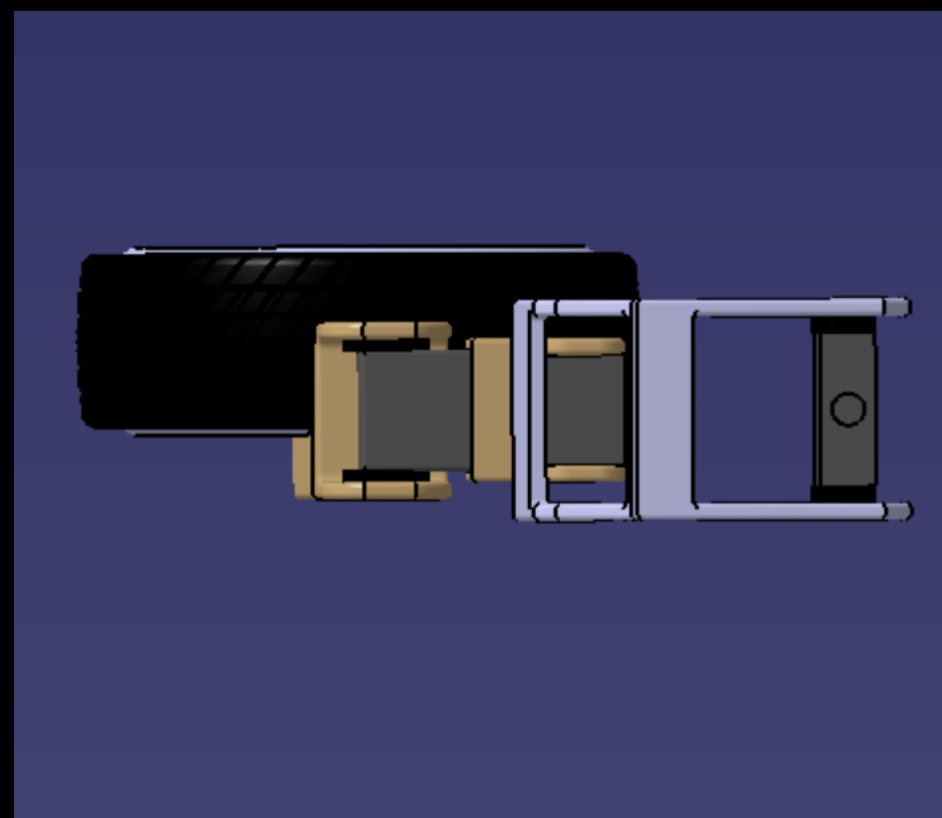
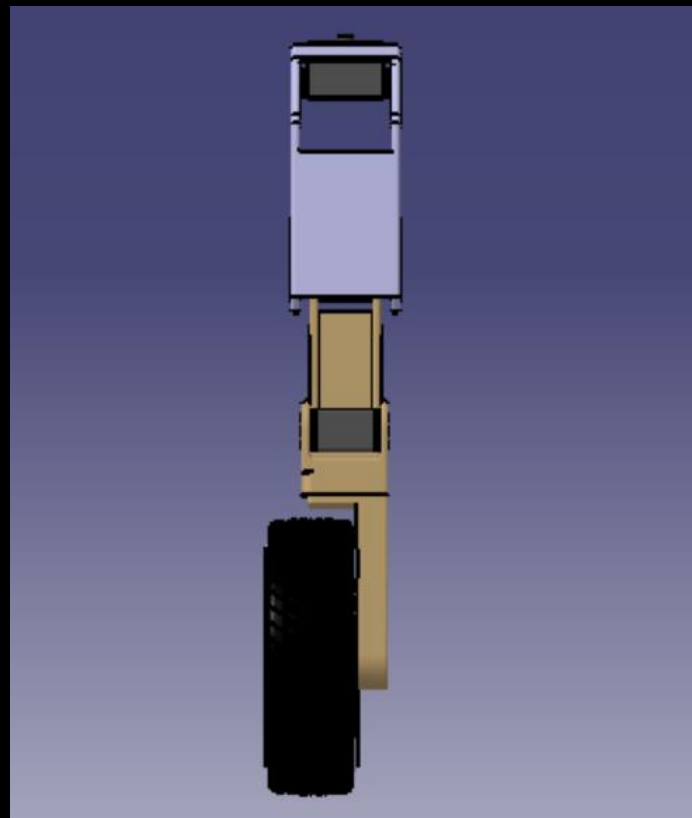
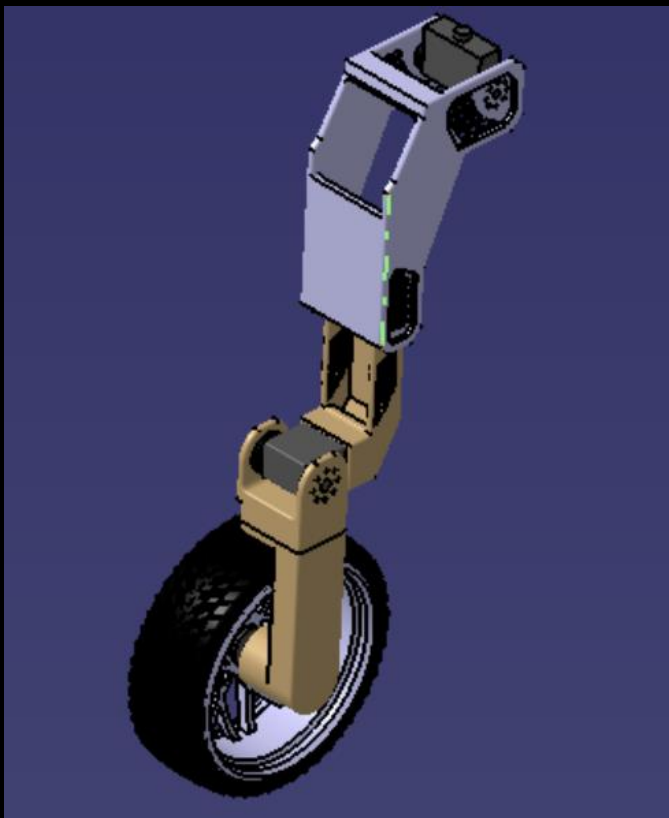
- **이유:** 서보 모터는 피드백 시스템을 통해 매우 정밀한 위치와 속도 제어가 가능하며, 관절의 복잡한 움직임을 부드럽고 정확하게 수행할 수 있습니다.
- **장점:** 정밀한 위치와 속도 제어, 높은 토크, 빠른 응답 속도, 다양한 하중과 조건에서의 안정적인 작동.

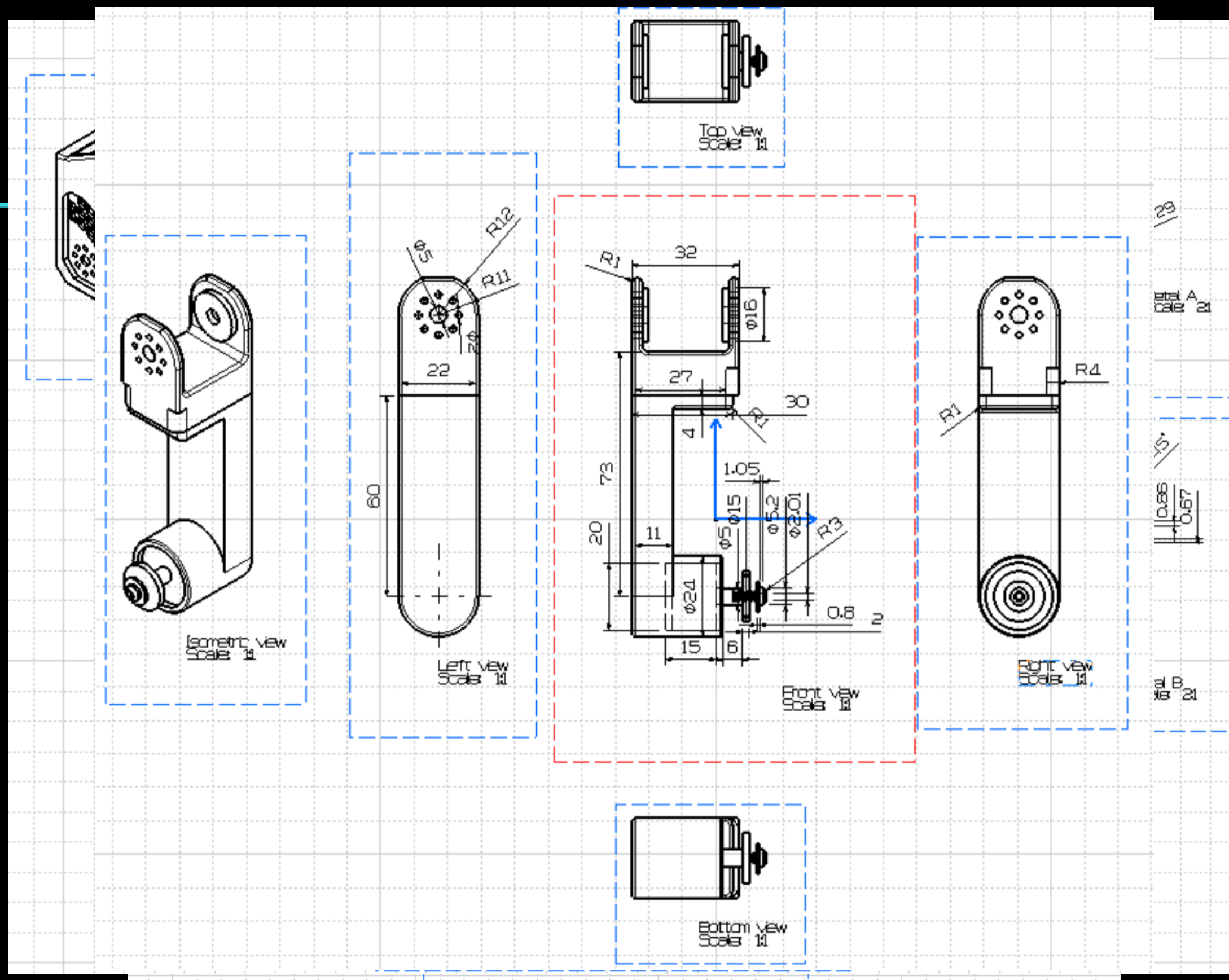
3. 바퀴 - BLDC 모터:

1. Frame

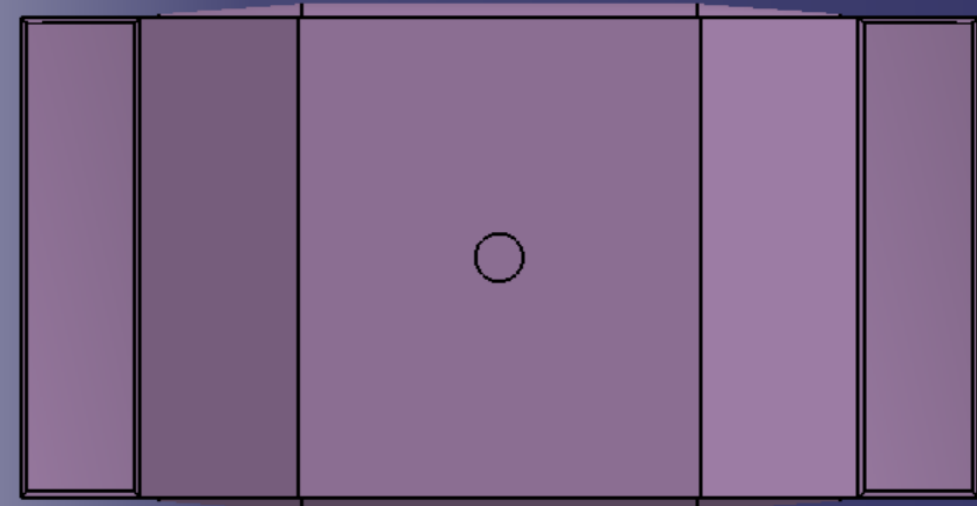
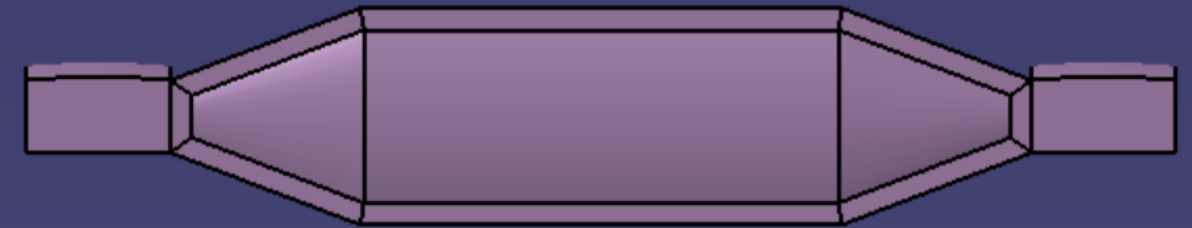
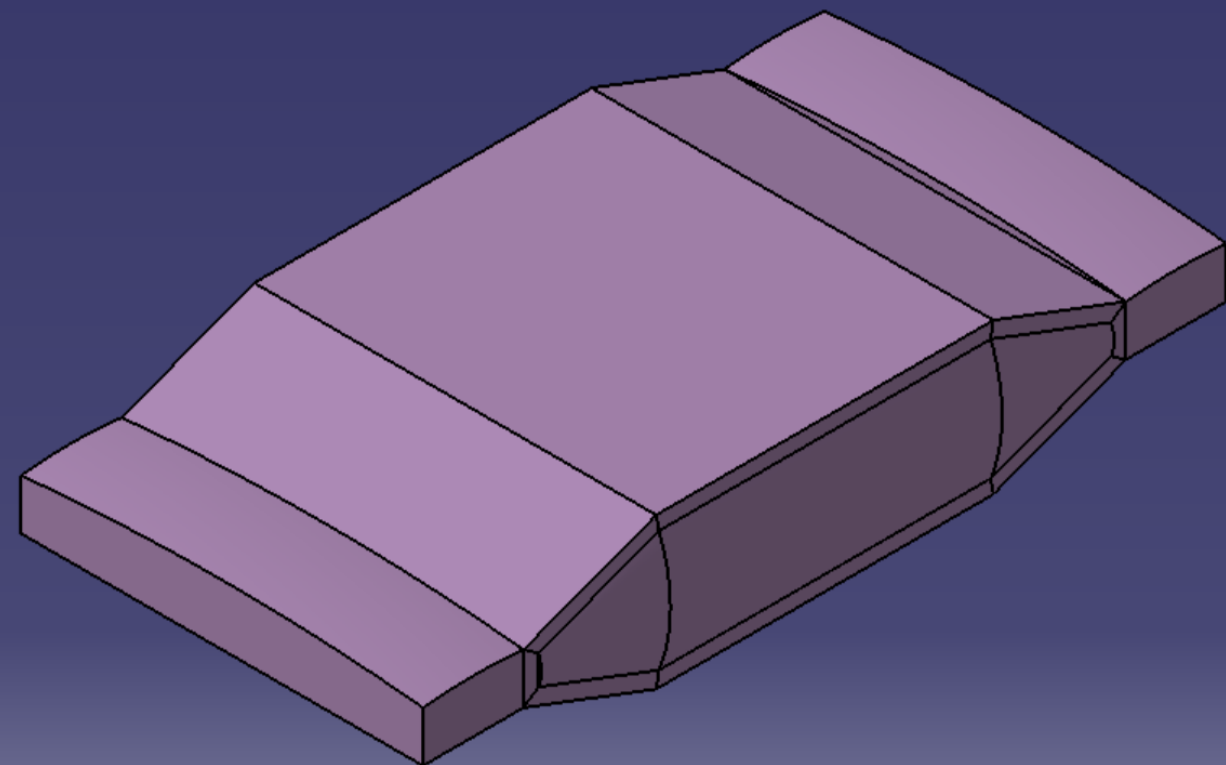


2. Leg and Wheel

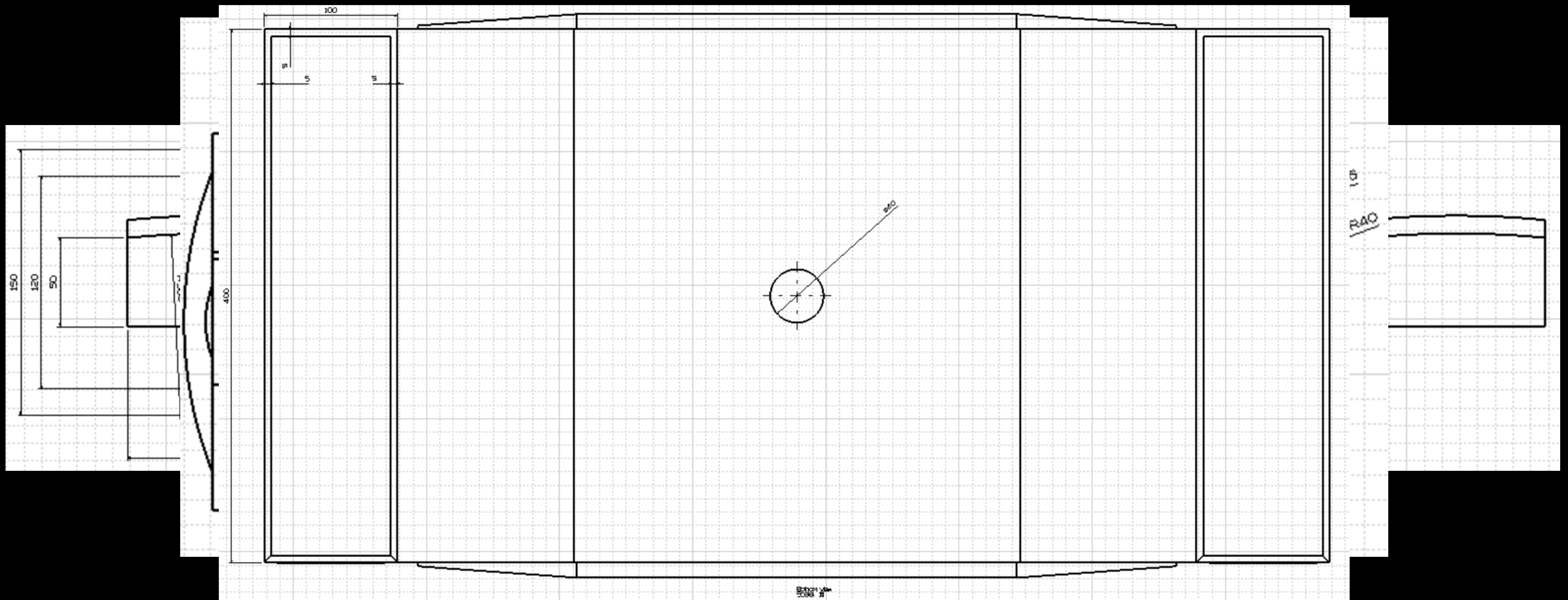




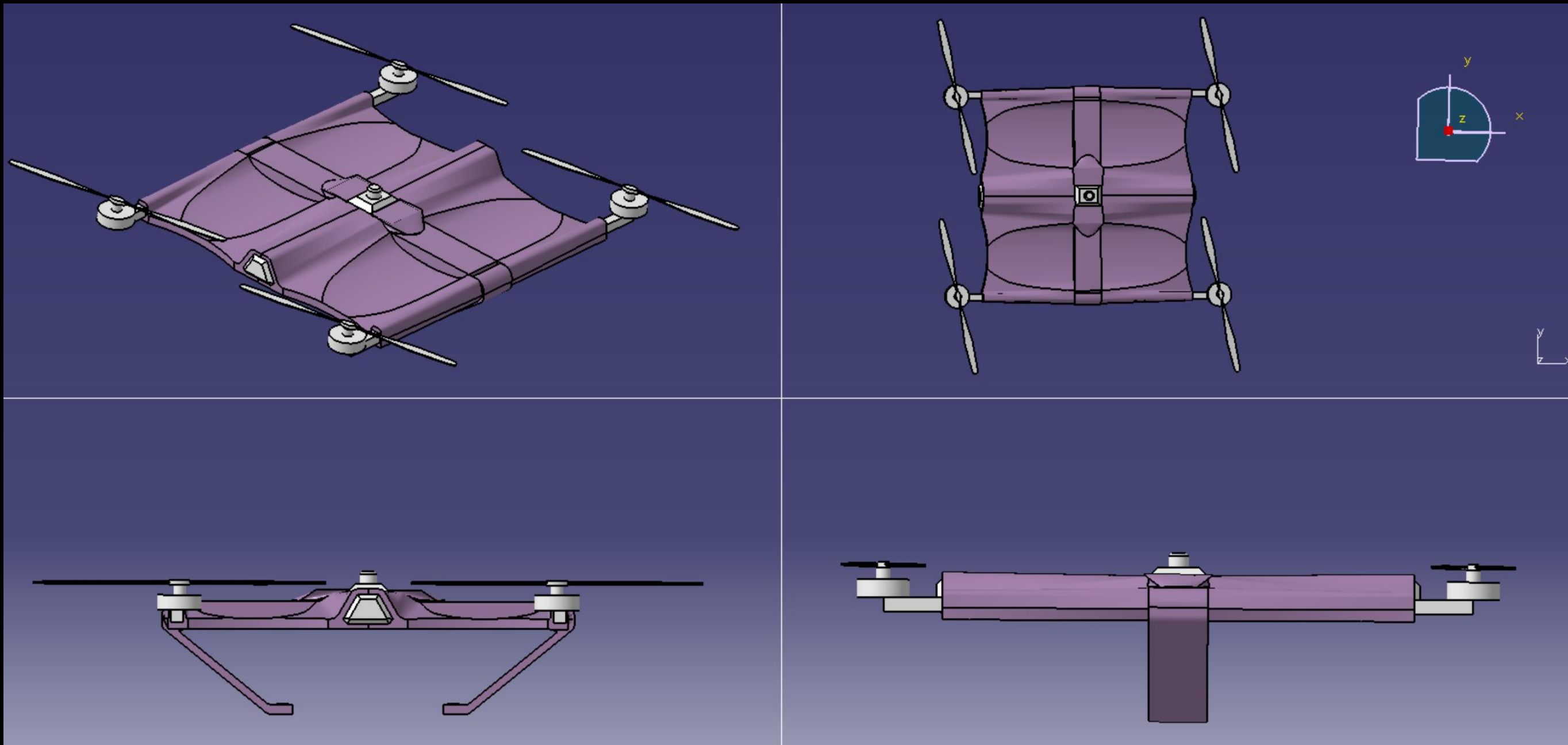
3. Payload

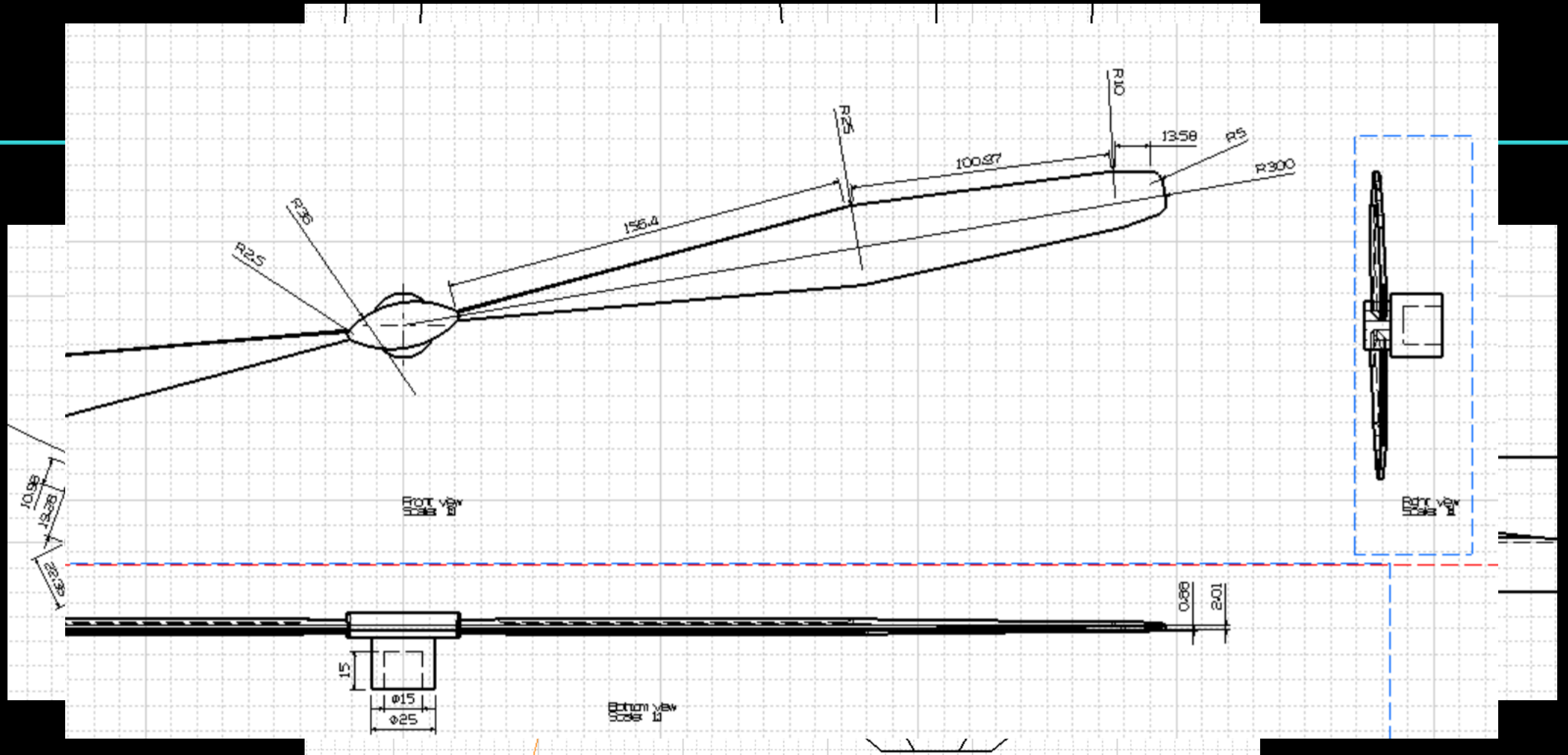


3. Payload

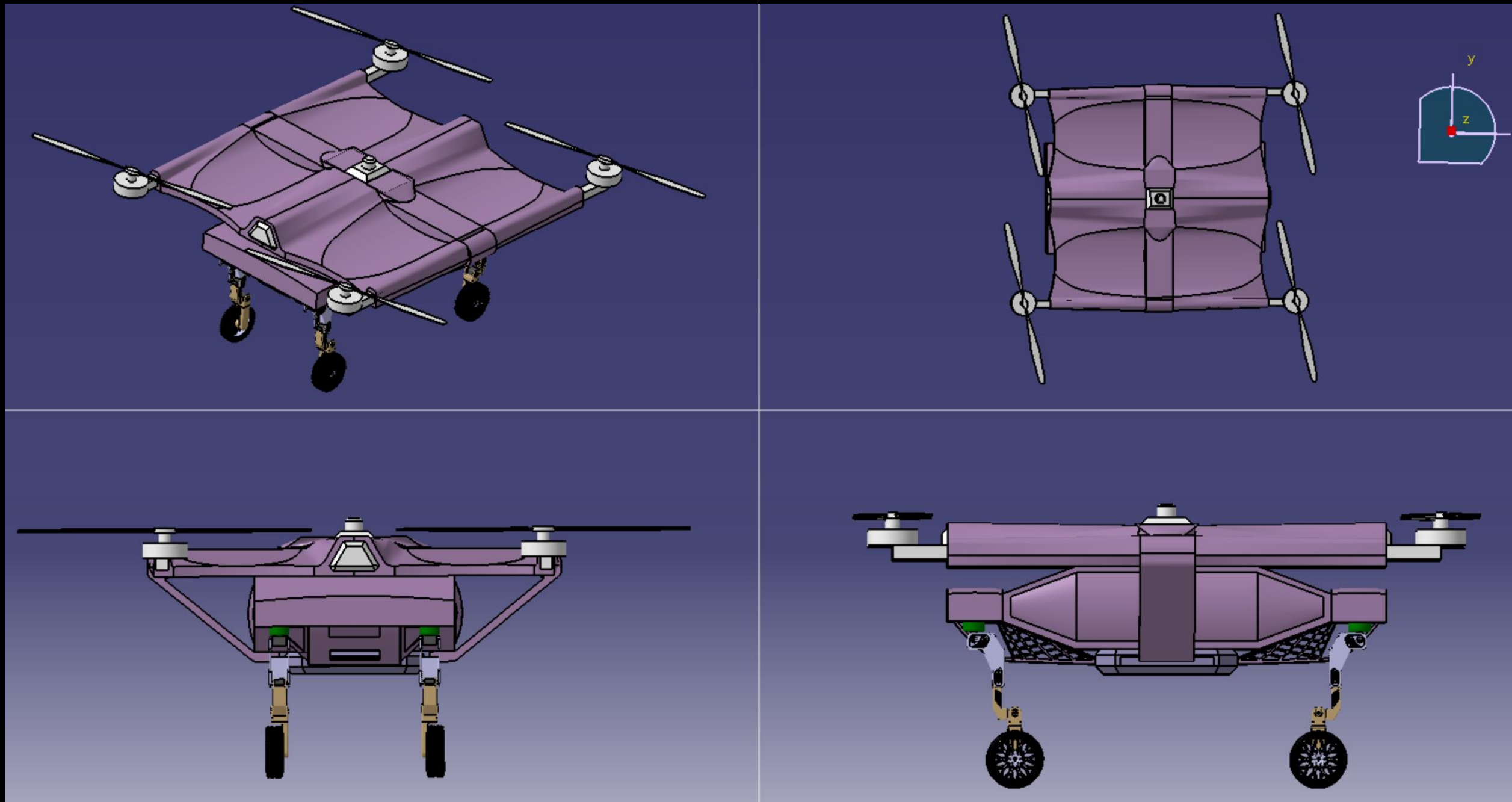


4. UAM





5. Assemble

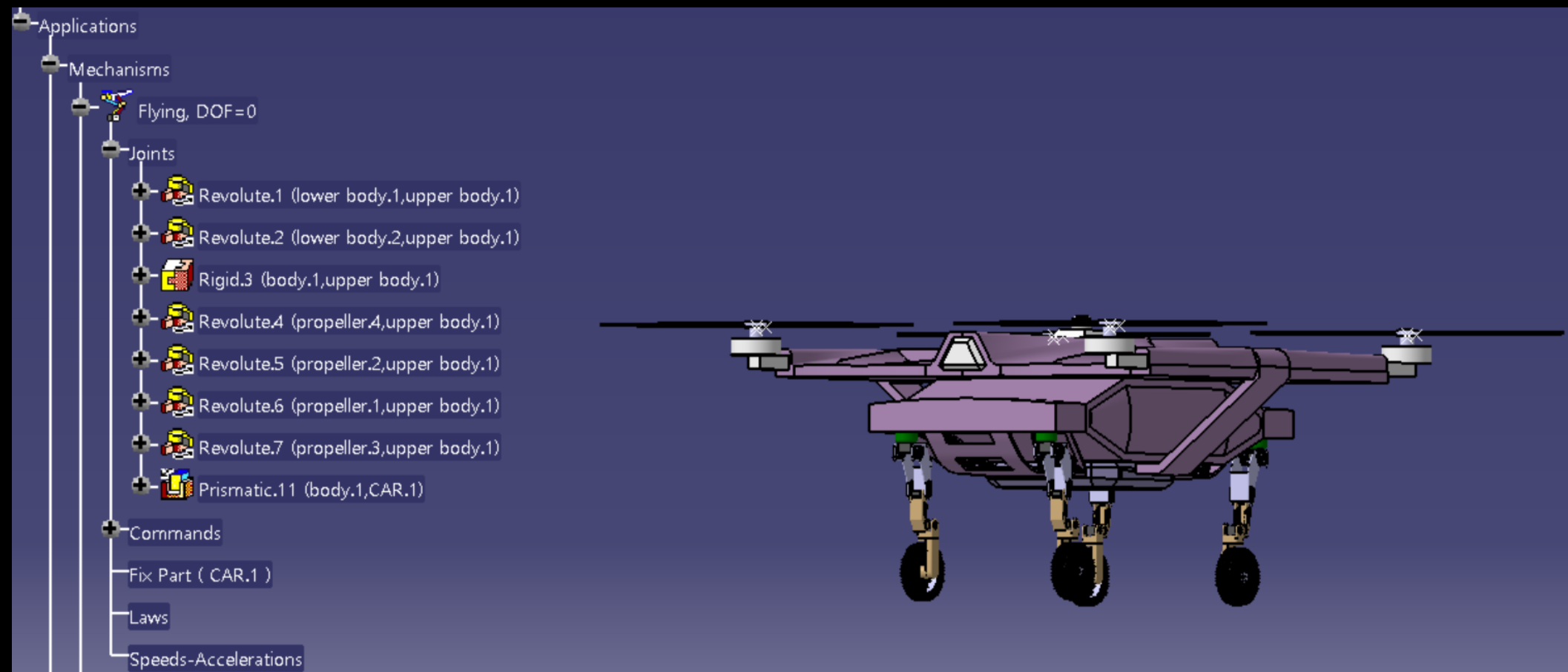


- HERO (High-altitude emergency response operator) ○

03

DMU Kinematics

Flying

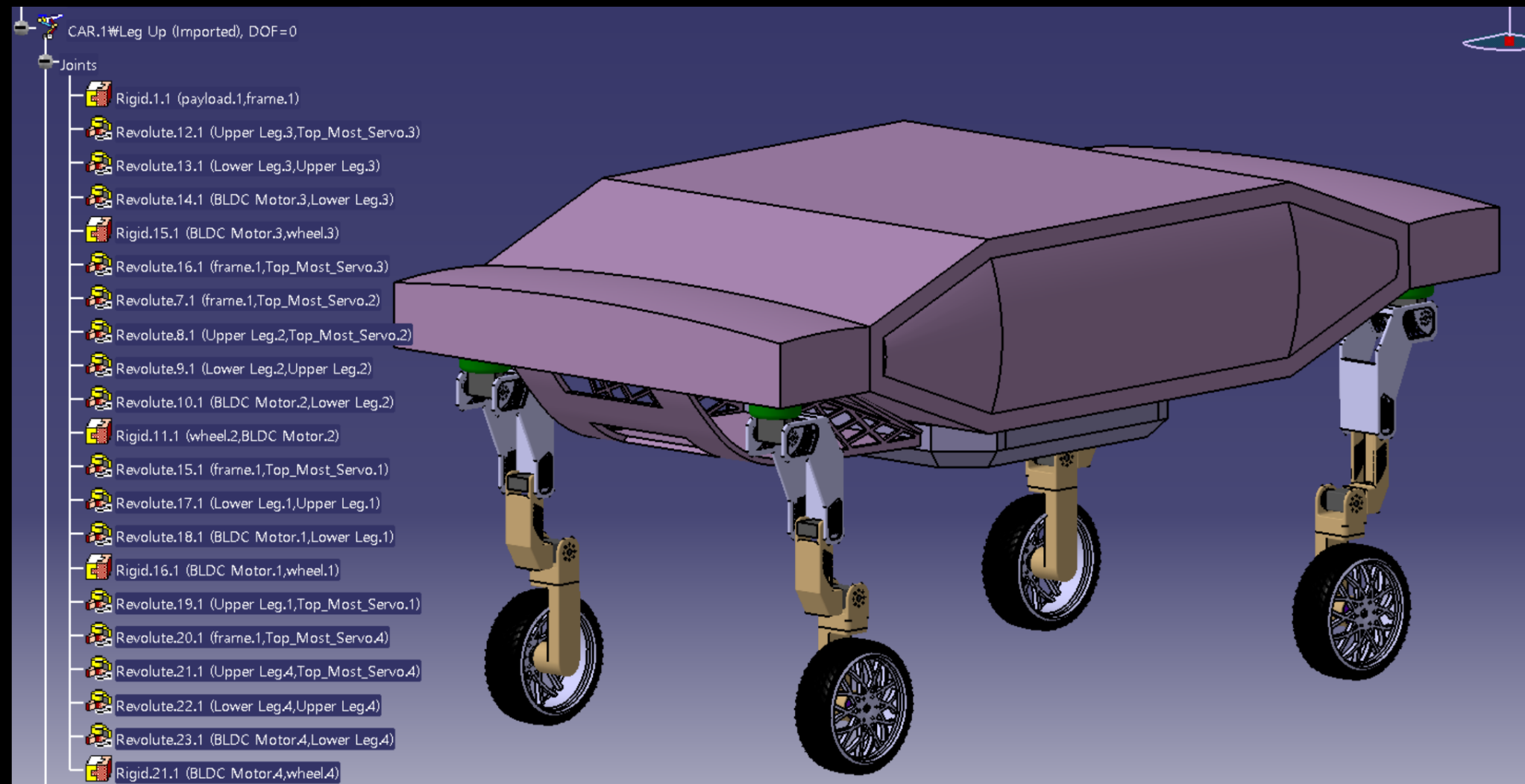


Flying Mechanism

UMA Vertical Rise:
Prismatic Joint

Rotary Wing's rotation:
Revolute Joint

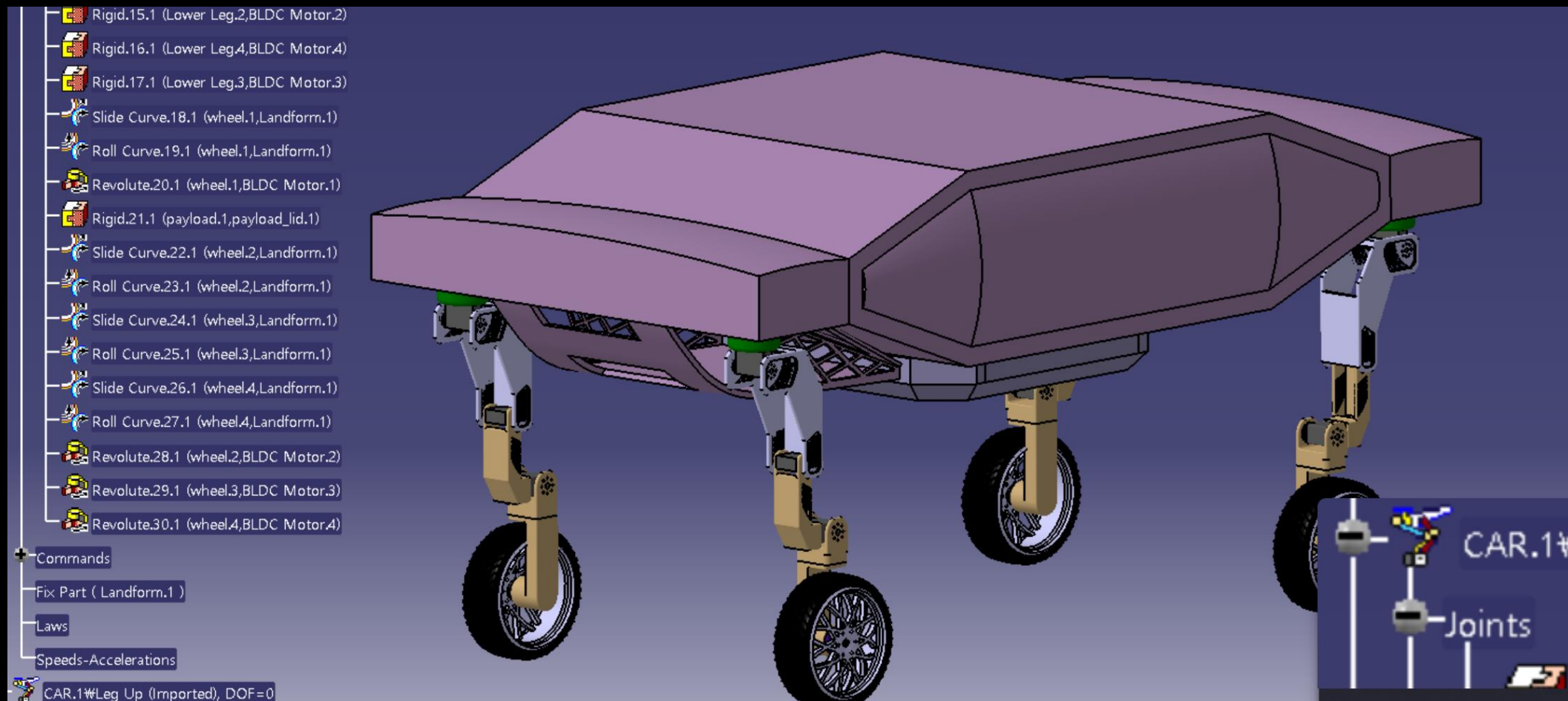
Leg Up



Leg Up Mechanism

Bracket and Servo Motors:
Only Revolute Joint
w/ Rigid Body

Straight



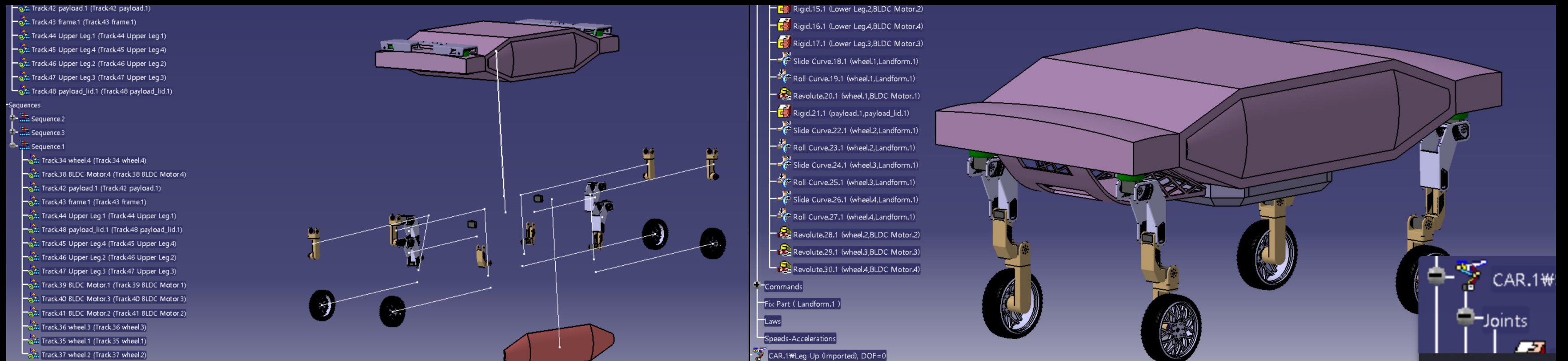
Straight Mechanism
Wheel – Ground:
Roll Curve, Slide Curve

Wheel – Brackets:
Revolute Joint

Single Commanded

Offset.375.1 (Track for Flying UAM.1,payload.1)

DMU Fitting



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04

Video

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05

Conclusion

- HERO (High-altitude emergency response operator) ○

06

Q&A

Reference

Modeling: <https://www.youtube.com/watch?v=FuqjDgndIro>

Image: <https://www.hyundai.com/au/en/news/mobility/hyundai-motor-group-unveils-tiger-uncrewed-ultimate-mobility-vehicle-concept>

ChatGPT

PPT: [디자인 플랫폼 미리캔버스 \(miricanvas.com\)](https://miricanvas.com)

ICON: <https://slidesgo.com/>

: 로봇 아이콘 제작자: Freepik - Flaticon

Educational: <http://cdl.hanyang.ac.kr/>

BGM: <https://www.youtube.com/watch?v=S3wH92v3A3k>



THANKS FOR WATCHING