

심해 탐사선



팀명: 니모를 찾아서
2019048177 김지현
2019090982 문희민

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- 프로젝트 설명
- 제작 시 어려웠던 점
- 질의응답

주제 선정 배경

1. 심해의 다양한 연구자료

아직 인류가 탐사한 심해는 전체의 2%



심해연구 필요! => 심해탐사선

2. 심해의 풍부한 해저자원

망가니즈 단괴, 가스 하이드레이트, 열수공



프로젝트 설명



프로젝트 설명

전체적인 계획

- 심해탐사선 외관 디자인은 영화 '메가로돈' 심해 탐사선 참고
- 구동력은 '8-Radial Engine' 사용

세부적인 계획

- 심해 탐사선의 디자인은 곡면이 많이 존재 ➡ generate shape design 사용
- 복잡한 8-Radial Engine과 심해탐사선의 미사일 지지대, 탑승 모션 ➡ assembly design & kinematic 사용

최종 계획

- kinematic 과 joint를 이용하여 탑승 장치 및 미사일 발사 구현
- 8-Radial Engine을 구동시켜 심해탐사선의 움직임을 구현

프로젝트 설명

역할 분담

문희민

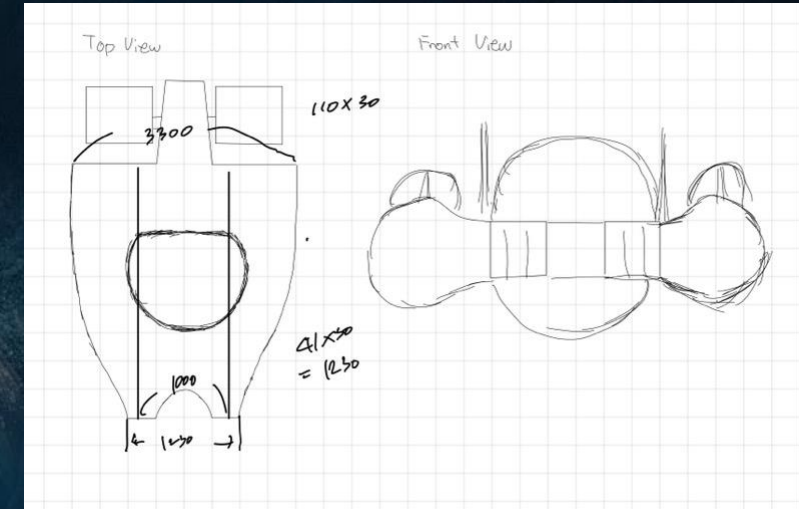
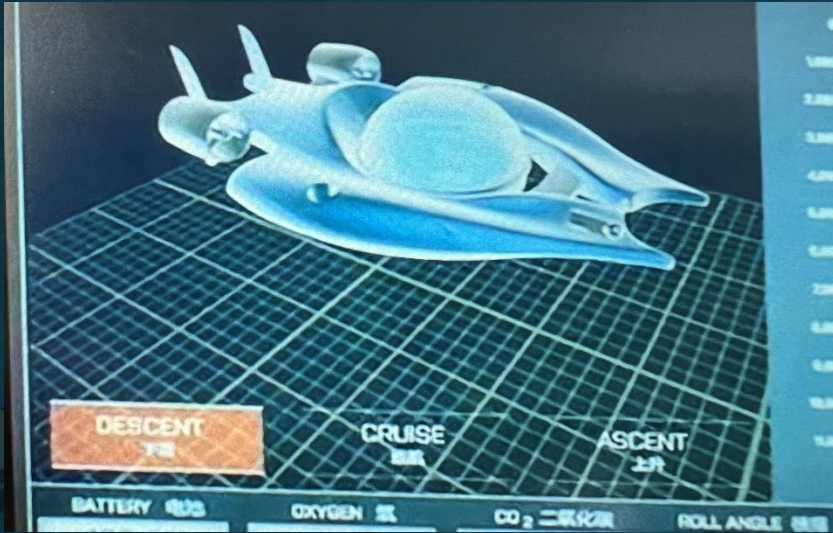
- 탐사선 외관 모델링(generate shape design & part design)
- door , 미사일 지지대 , 미사일 덮개 모델링(part design & DMU kinematic)
- ppt 제작

김지현

- 8-Radial Engine 모델링(part design & DMU kinematic)
- 프로펠러 모델링 (generate shape design)
- 동영상 제작

프로젝트 설명

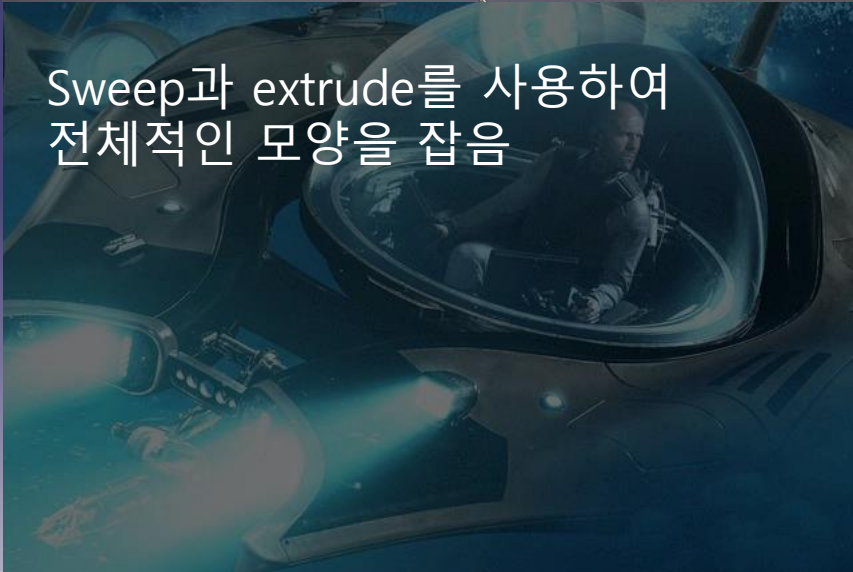
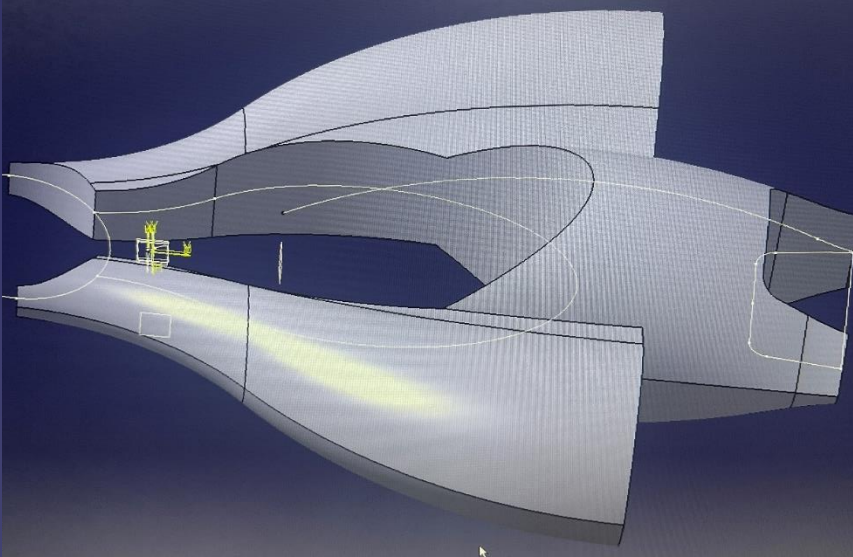
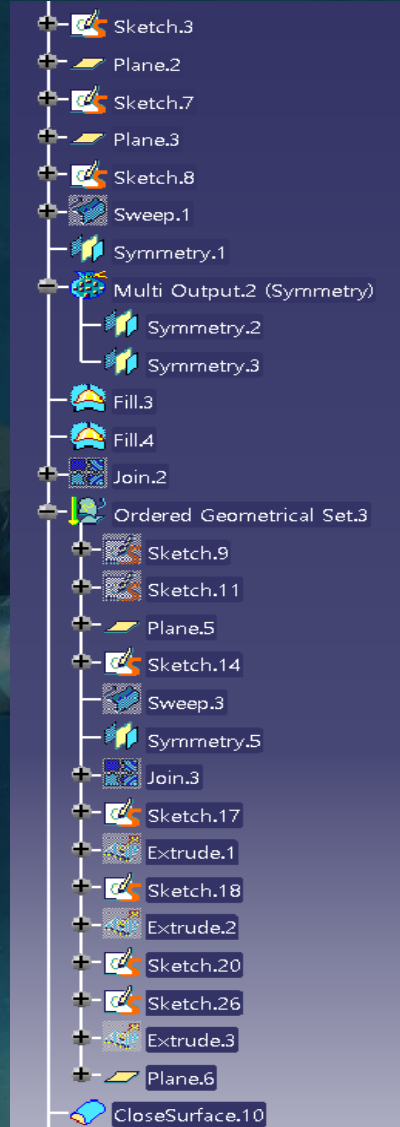
-심해 탐사선 외관 (Generative Shape Design & part design)



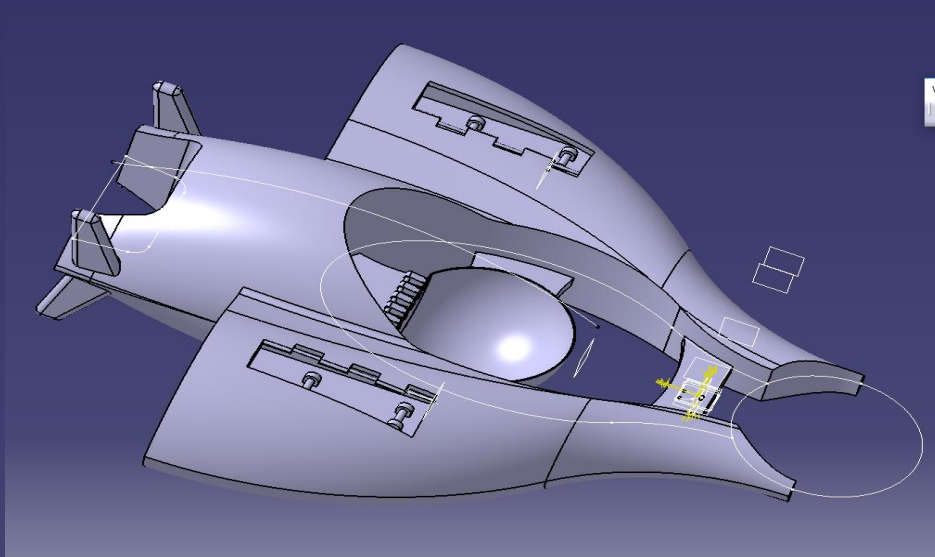
심해탐사선에 대한 도면이 없기 때문에 영화에서의 이미지로 직접 도면을 그려 디자인

프로젝트 설명

-탐사선 외관 (Generative Shape Design & part design)



Sweep과 extrude를 사용하여
전체적인 모양을 잡음



Part design에 업로드 후 'close surface'를
이용하여 볼륨을 형성
Part design 기능들을 사용하여 원하는
Model을 형성

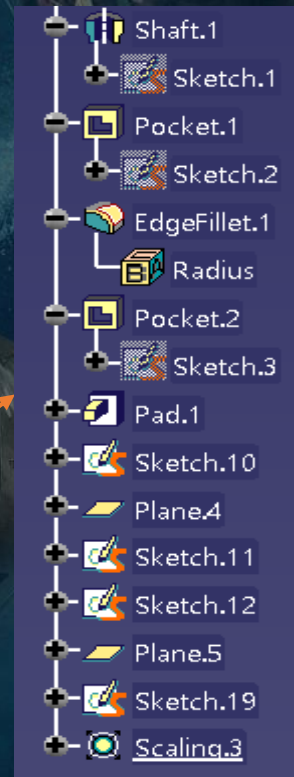
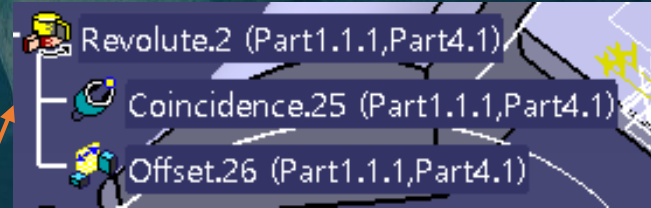
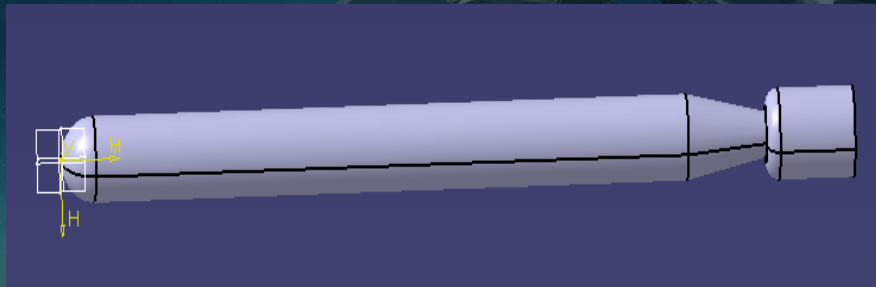
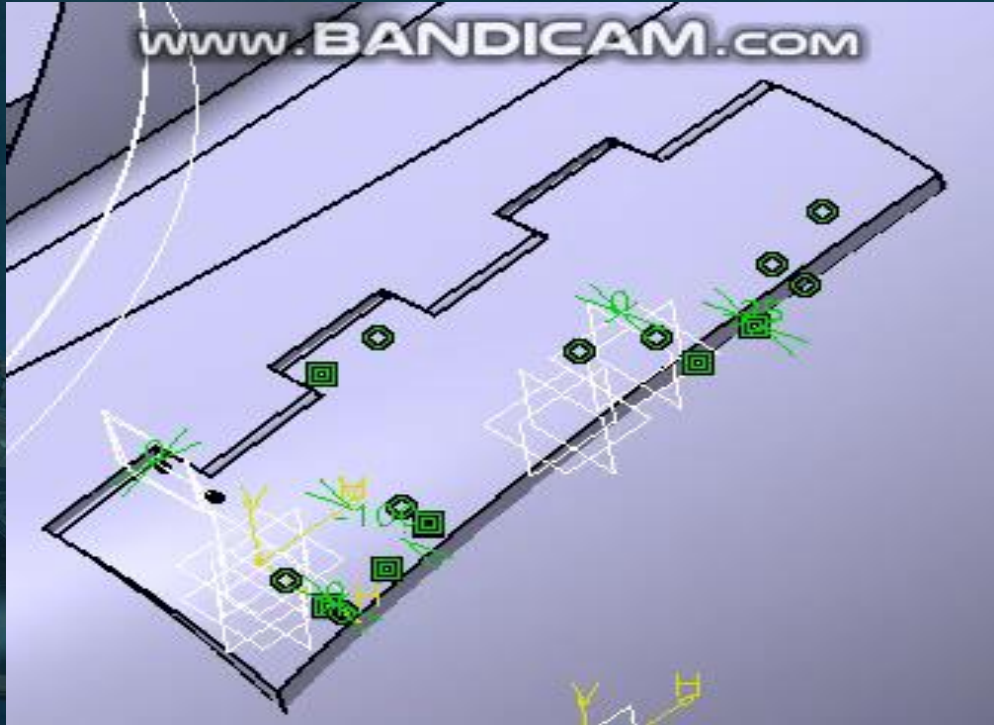
프로젝트 설명

-탐사선 door (part design & DMU kinematic)



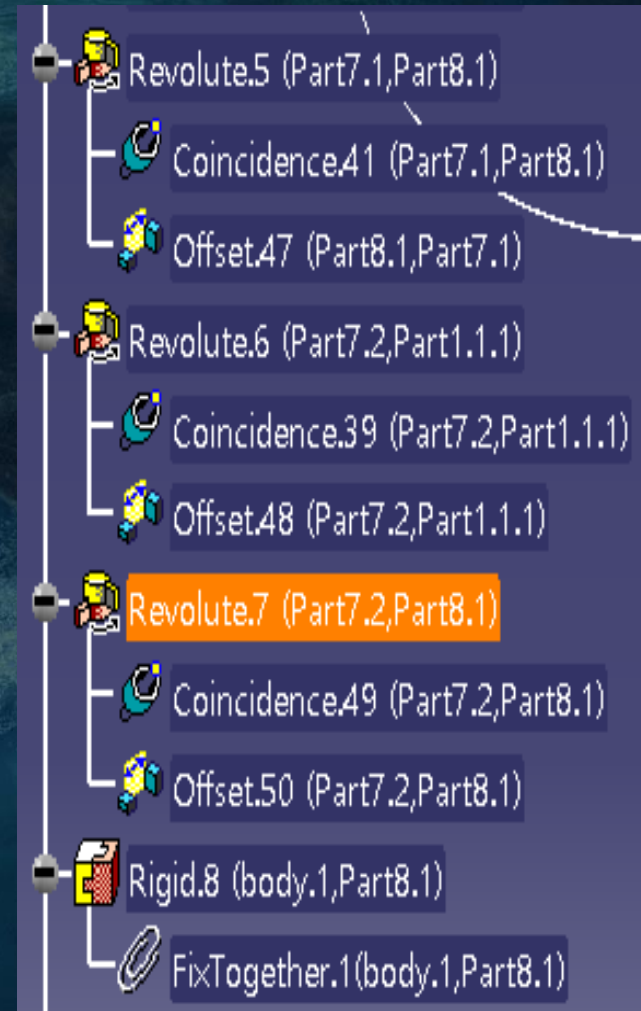
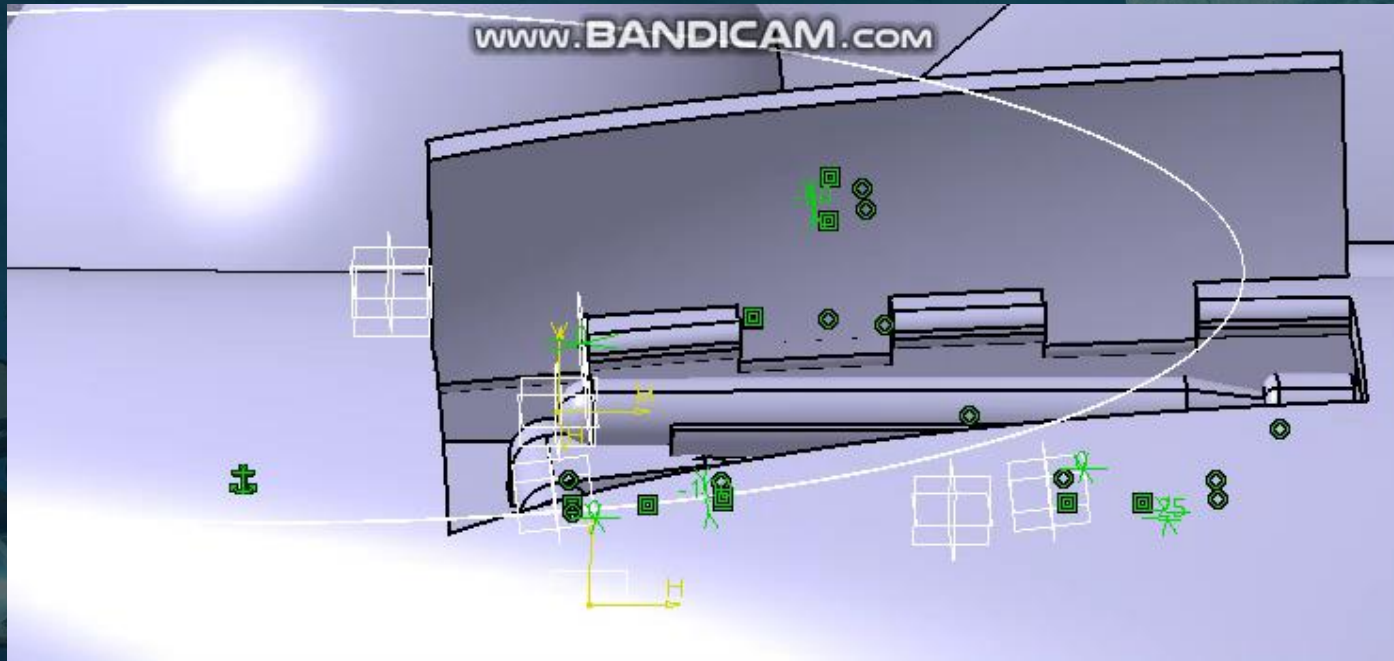
프로젝트 설명

-탐사선 미사일 및 덮개 (part design & DMU kinematic)



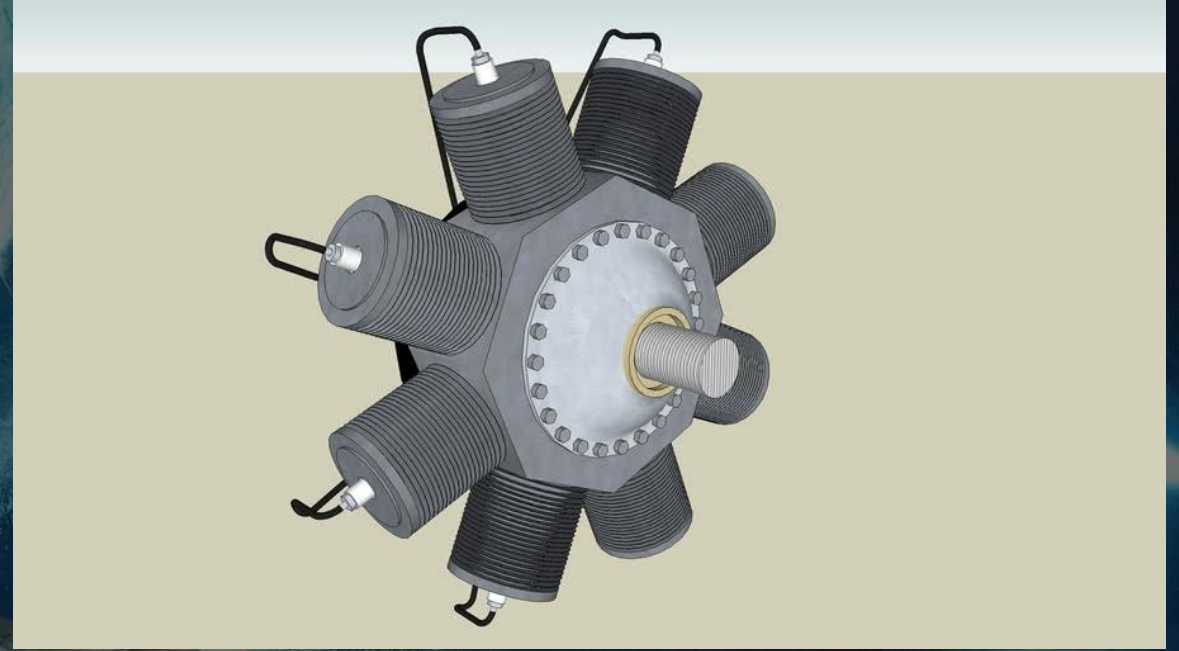
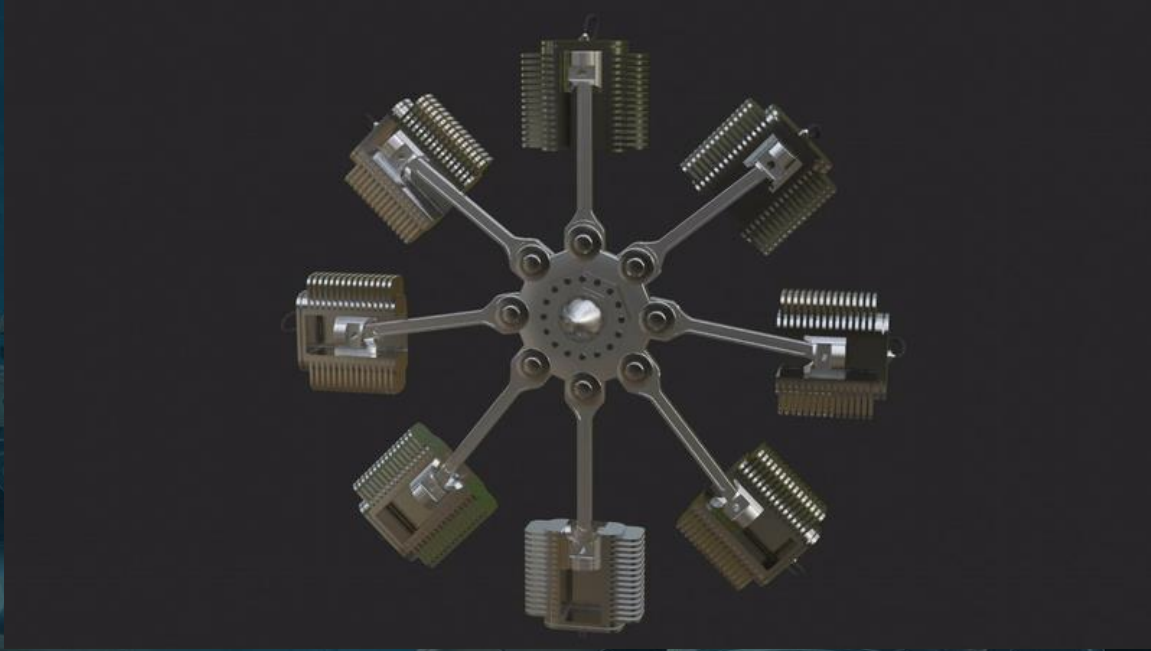
프로젝트 설명

-탐사선 미사일 발사대 (part design & DMU kinematic)



프로젝트 설명

- 8-Radial Engine (Part Design)



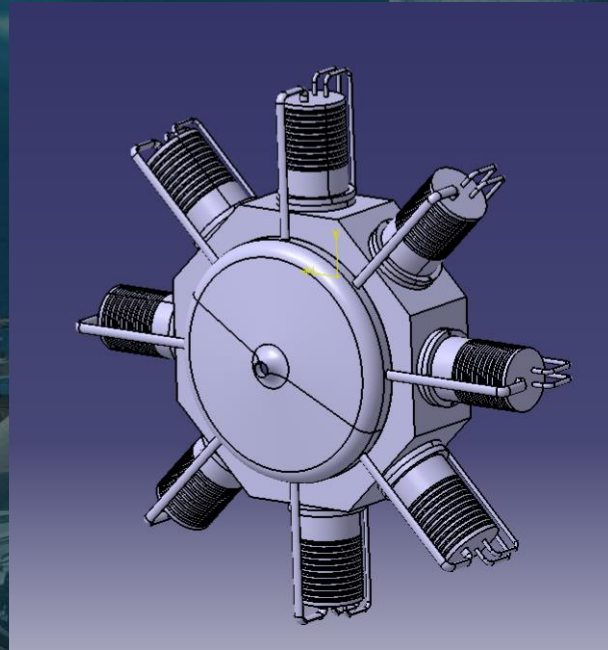
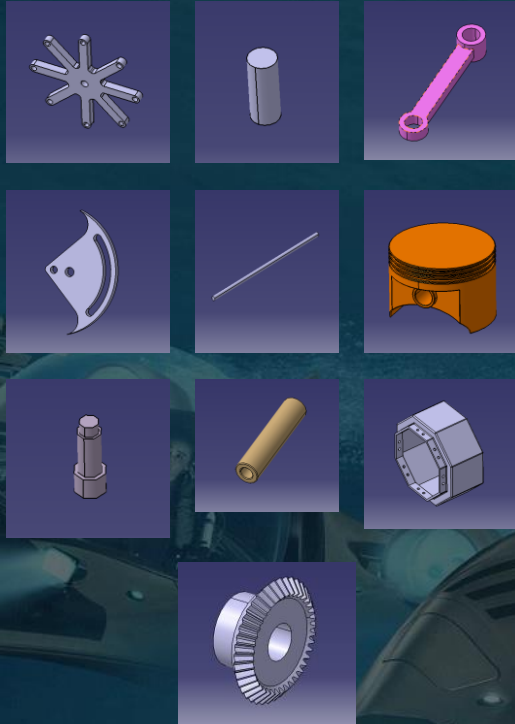
따로 도면을 찾지 않고 구글을 사용해 이미지나 유튜브 설명을 참고하여 제작

참고자료:

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

프로젝트 설명

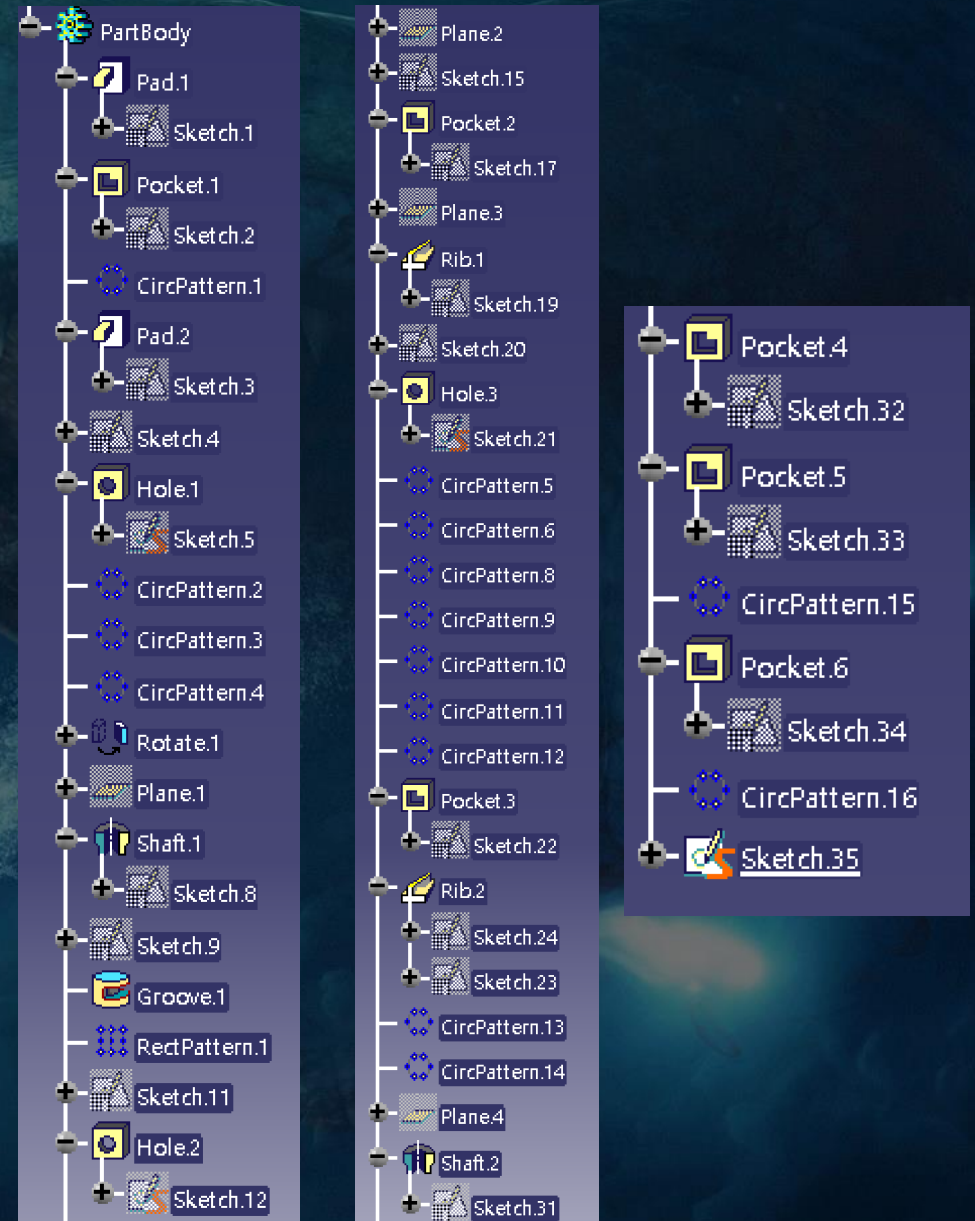
- 8-Radial Engine (Part Design)



Pad, Pocket, Fillet, Shell,
Auto Fillet 등 기능 사용

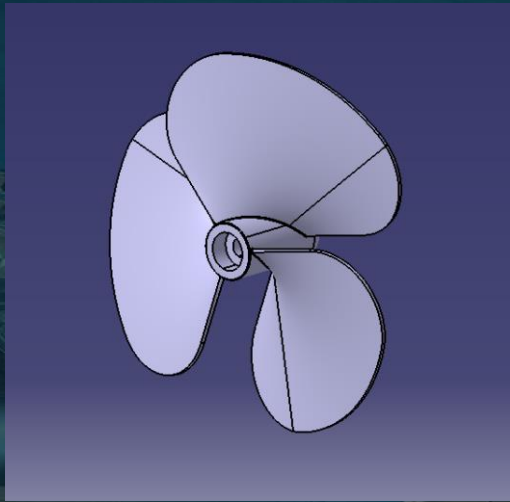
*Piston <- 과제

*BevelGear <- GrabCad

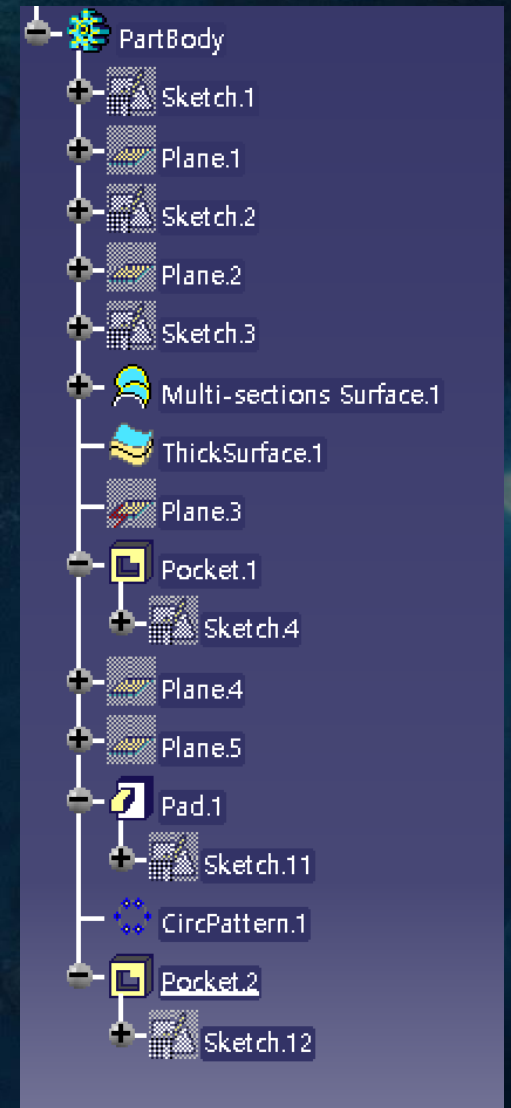
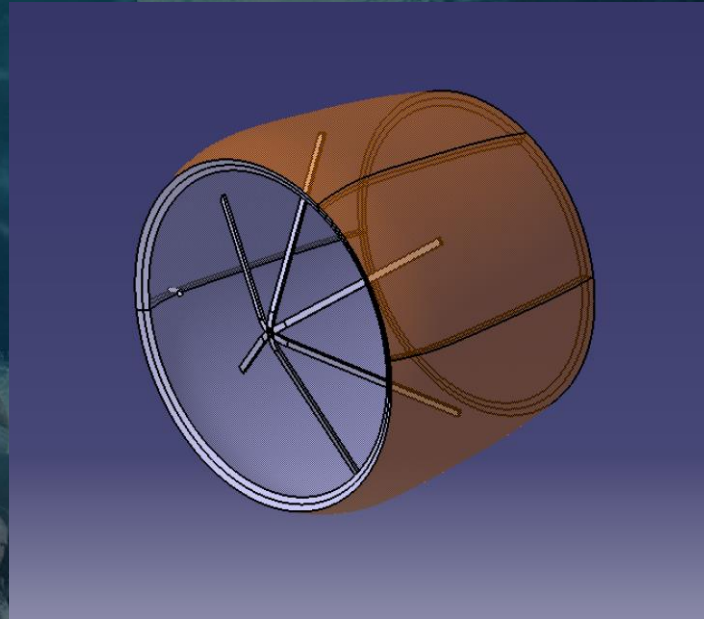


프로젝트 설명

- Propeller (Part Design & Generative Shape Design)

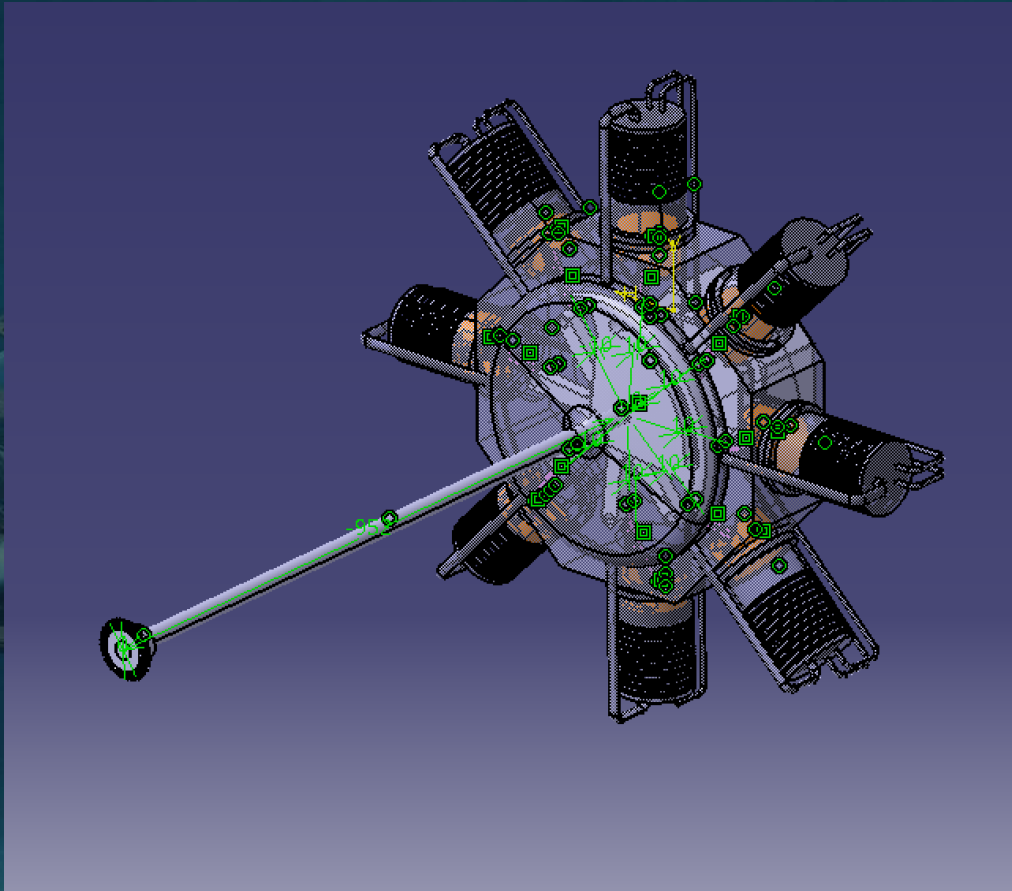


Grabcad에서
Outsourcing하여
Scaling으로 크기 조절



프로젝트 설명

• Assembly Design

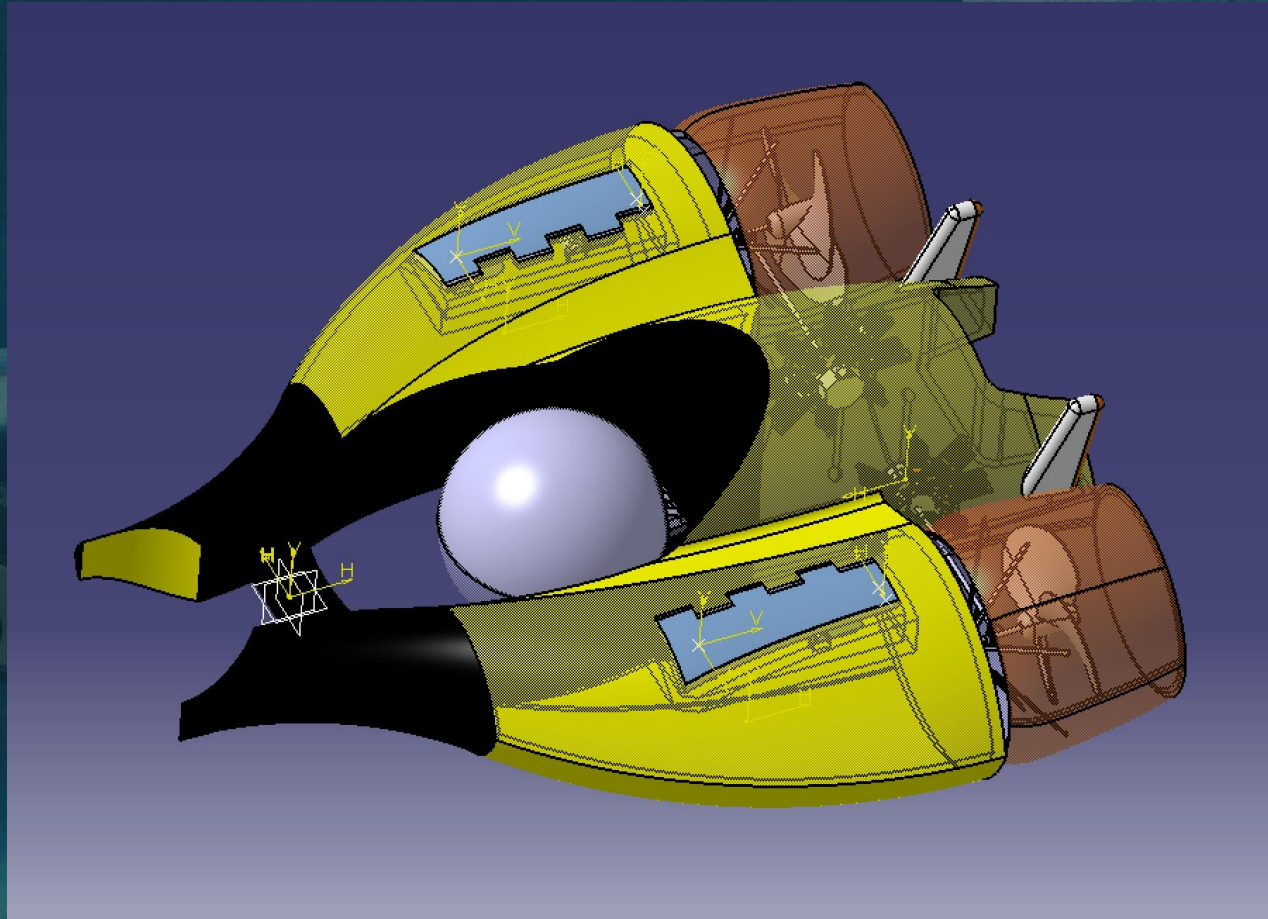


- Part1.2 (Part1.1)
- Part19 (Part19.1)
- Part1 (Part1.3)
- piston head (piston head.1)
- bolt2 (bolt2.1)
- pin (pin.1)
- connecting rod (connecting rod.1)
- connecting rod (connecting rod.2)
- pin (pin.2)
- bolt2 (bolt2.2)
- piston head (piston head.2)
- connecting rod (connecting rod.3)
- pin (pin.3)
- bolt2 (bolt2.3)
- piston head (piston head.3)
- connecting rod (connecting rod.4)
- pin (pin.4)
- bolt2 (bolt2.4)
- piston head (piston head.4)
- connecting rod (connecting rod.5)
- pin (pin.5)
- bolt2 (bolt2.5)
- piston head (piston head.5)
- connecting rod (connecting rod.6)
- pin (pin.6)
- bolt2 (bolt2.6)

- piston head (piston head.6)
- connecting rod (connecting rod.7)
- pin (pin.7)
- bolt2 (bolt2.7)
- piston head (piston head.7)
- connecting rod (connecting rod.8)
- pin (pin.8)
- bolt2 (bolt2.8)
- piston head (piston head.8)
- Part10 (Part10.1)
- Part10.1 (Part10.2)
- Part12 (Part12.1)
- Bewel-Gear-Part1_A0540M4Q_Mekanex_
- Constraints
- Applications

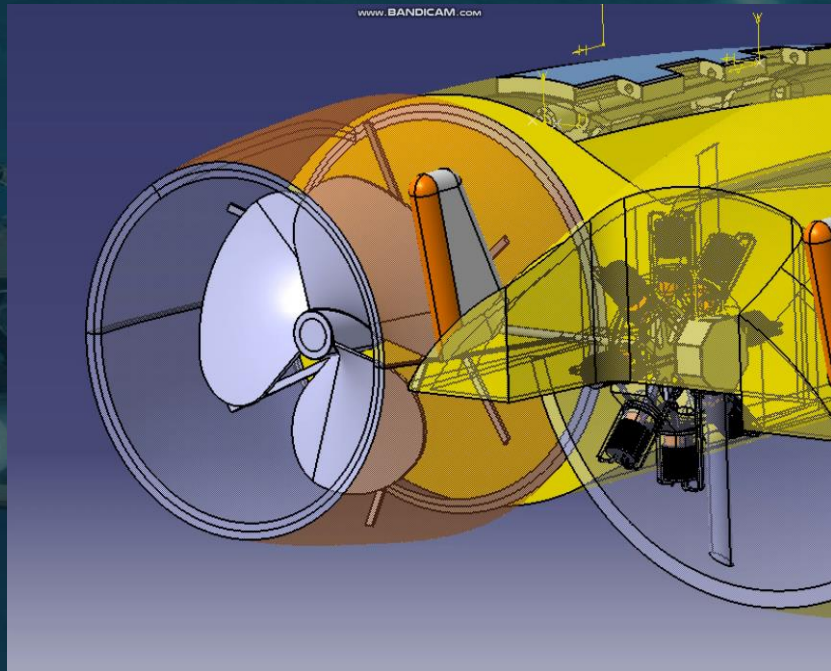
프로젝트 설명

• Assembly Design



프로젝트 설명

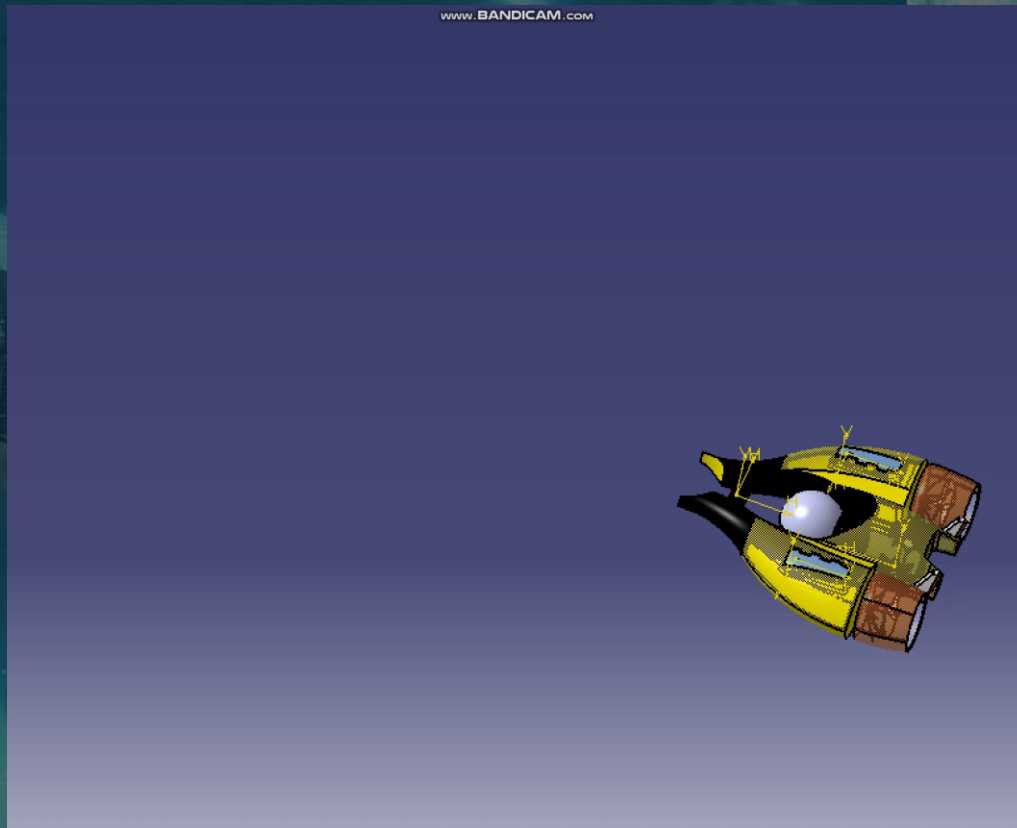
• Kinematics



- Rigid.1.1 (Part1.3,connecting rod.5)
- Revolute.18.1 (connecting rod.1,pin.1)
- Revolute.19.1 (connecting rod.6,pin.6)
- Revolute.20.1 (pin.2,connecting rod.2)
- Revolute.21.1 (connecting rod.4,pin.4)
- Revolute.22.1 (connecting rod.7,pin.7)
- Revolute.23.1 (connecting rod.3,pin.3)
- Revolute.24.1 (connecting rod.5,pin.5)
- Revolute.25.1 (pin.8,connecting rod.8)
- Rigid.26.1 (piston head.7,pin.7)
- Rigid.27.1 (pin.7,bolt.2.7)
- Rigid.28.1 (piston head.3,pin.3)
- Rigid.29.1 (pin.3,bolt.2.3)
- Rigid.30.1 (piston head.5,pin.5)
- Rigid.31.1 (pin.5,bolt.2.5)
- Rigid.32.1 (piston head.8,pin.8)
- Rigid.33.1 (pin.8,bolt.2.8)
- Rigid.34.1 (piston head.1,pin.1)
- Rigid.35.1 (pin.1,bolt.2.1)
- Rigid.36.1 (piston head.6,pin.6)
- Rigid.37.1 (pin.6,bolt.2.6)
- Rigid.38.1 (piston head.2,pin.2)
- Rigid.39.1 (pin.4,bolt.2.4)
- Rigid.40.1 (piston head.4,pin.4)
- Rigid.41.1 (pin.2,bolt.2.2)
- Rigid.43.1 (Part1.1,Part19.1)
- Prismatic.39.1 (piston head.6,Part19.1)
- Prismatic.40.1 (piston head.2,Part19.1)
- Prismatic.41.1 (piston head.4,Part19.1)
- Prismatic.42.1 (piston head.7,Part19.1)
- Prismatic.43.1 (piston head.3,Part19.1)
- Prismatic.44.1 (piston head.5,Part19.1)
- Prismatic.45.1 (piston head.8,Part19.1)
- Prismatic.46.1 (piston head.1,Part19.1)
- Rigid.46.1 (Part10.2,Part10.1)
- Rigid.47.1 (Part12.1,Part10.1)
- Revolute.47.1 (Part10.2,Part1.3)
- Revolute.48.1 (Part12.1,Part19.1)
- Revolute.49.1 (connecting rod.4,Part1.3)
- Revolute.50.1 (Part1.3,connecting rod.7)
- Revolute.51.1 (Part1.3,connecting rod.3)
- Rigid.50.1 (Bevel-Gear-Part1_A0540M40_Mekanex_A0540M40_Mekanex.1,Part12.1)
- Revolute.43.1 (connecting rod.8,Part1.3)
- Revolute.44.1 (Part1.3,connecting rod.1)
- Revolute.45.1 (Part1.3,connecting rod.6)
- Revolute.46.1 (Part1.3,connecting rod.2)
- Rigid.1 (Part2.3,Part1.1.2)
- Rigid.2 (Bevel-Gear-Part1_A0540M40_Mekanex_A0540M40_Mekanex.1,Part1.1.2)
- Revolute.3 (Part1.1.2,Part2.2)
- Rigid.4 (Symmetry of Part2.2.1,Part2.2)
- Rigid.5 (Symmetry of Part2.3.1,Symmetry of Part1.1.2.1)
- Rigid.6 (Symmetry of Bevel-Gear-Part1_A0540M40_Mekanex_A0540M40_Mekanex.1,Part1.1.2.1)
- Revolute.7 (Symmetry of Part1.1.2.1,Symmetry of Part2.2.1)

프로젝트 설명

- Kinematics



- Revolute.1 (Part1.1.1,Part2.1)
- Revolute.2 (Part1.1.1,Part4.1)
- Revolute.3 (Part1.1.1,Part6.1)
- Revolute.4 (Part1.1.1,Part7.1)
- Revolute.5 (Part7.1,Part8.1)
- Revolute.6 (Part7.2,Part1.1.1)
- Revolute.7 (Part7.2,Part8.1)
- Rigid.8 (body.1,Part8.1)
- Revolute.9 (Part7.5,Part1.1.1)
- Revolute.10 (Part7.5,Part8.2)
- Revolute.11 (Part7.3,Part8.2)
- Revolute.12 (Part7.3,Part1.1.1)
- Rigid.13 (body.2,Part8.2)
- Point Curve.14 (Part1.1.1,Part37.1)
- Point Curve.15 (Part1.1.1,Part37.1)
- Point Curve.16 (Part1.1.1,Part37.1)
- Rigid.17 (Part2.2,Part1.1.1)
- Rigid.18 (Symmetry of Part2.2.1,Part1.1.1)
- Rigid.19 (Copy (1) of Symmetry of Product1.1_1.1,Part1.1.1)
- Rigid.20 (Product1.1.1,Part1.1.1)
- Rigid.21 (Part1.1.2,Part2.3)
- Rigid.22 (Bevel-Gear-Part1_A0540M40_Mekanex_A0540M40_Mekanex.1,Part1.1.1)
- Rigid.23 (Symmetry of Bevel-Gear-Part1_A0540M40_Mekanex_A0540M40_Mekanex.1,Part1.1.1)
- Rigid.24 (Symmetry of Part1.1.2.1,Symmetry of Part2.3.1)
- Rigid.25 (Part2.2,Part2.3)
- Rigid.26 (Symmetry of Part2.3.1,Copy (1) of Symmetry of Product1.1_1.1)

프로젝트 설명

- 구동 영상

https://youtu.be/ZG2aAa3_YuE

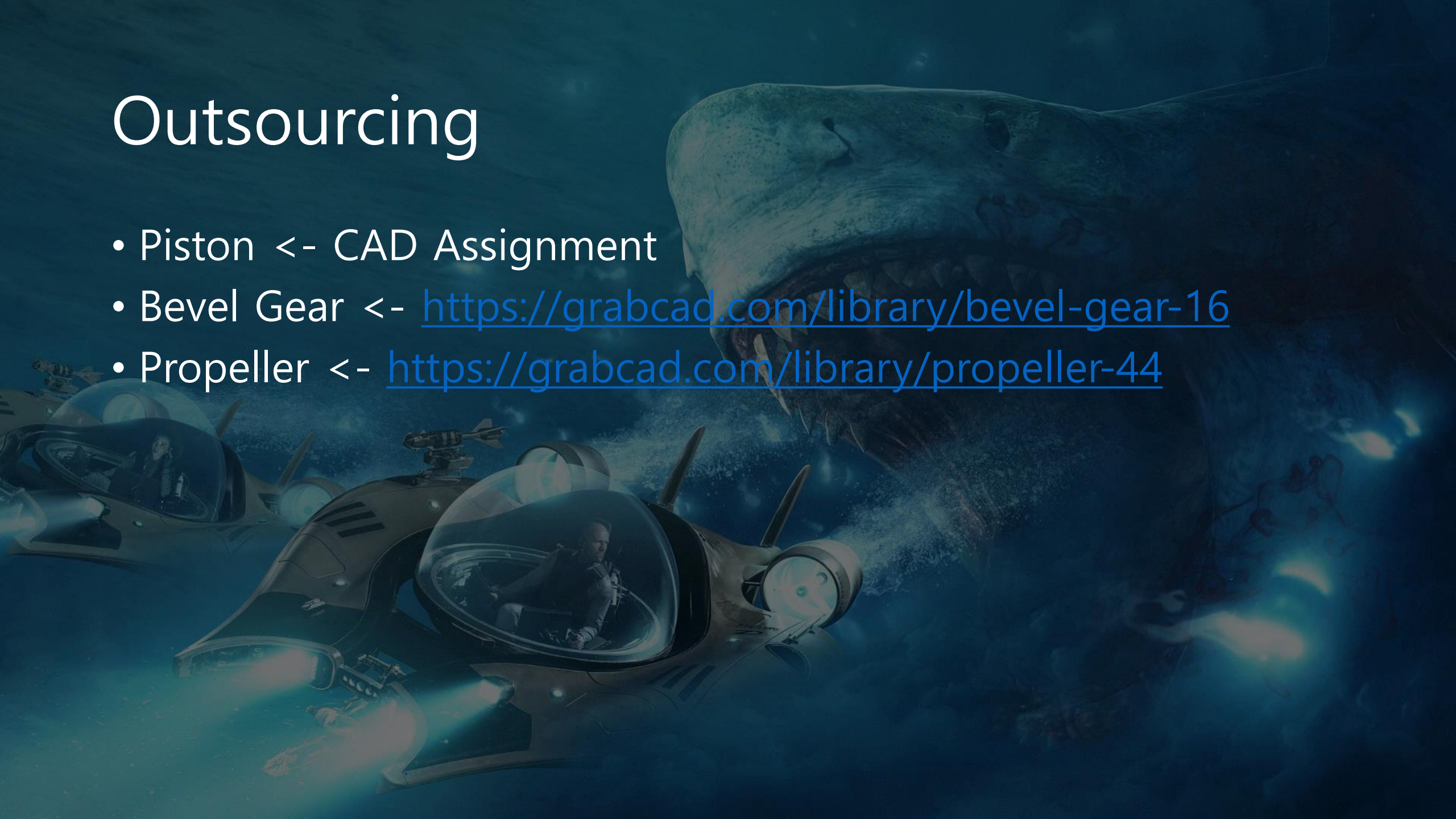


제작 시 어려웠던 점

- 도면이 존재하지 않고 영화상의 이미지를 구현하는 것에 어려움이 존재했다
- Assembly Design과 Kinematics를 이용한 엔진 구동이 많은 요소들을 필요로 하여 어려움이 존재했다
- 영상 제작 시 버퍼링이 심하여 제작이 어려웠다

Outsourcing

- Piston <- CAD Assignment
- Bevel Gear <- <https://grabcad.com/library/bevel-gear-16>
- Propeller <- <https://grabcad.com/library/propeller-44>



질의응답



A dramatic underwater scene from the movie 'Jaws'. A massive shark is shown from the chest up, its mouth wide open, revealing sharp teeth. It is positioned on the right side of the frame. In the foreground, two military-style submarines are visible. The one in the center is closer and more prominent, with a pilot visible in the cockpit. It has a searchlight and other equipment on its side. Another submarine is visible behind it to the left. The water is dark blue with some light reflecting off the surface. The overall mood is tense and action-packed.

감사합니다!