

TRANSFORMER

배석환 백승언 홍승우

Introduction

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1. 팀명, 주제 & 선정이유

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1. 팀명, 주제 & 선정이유



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팀명 : Black Swan

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선정 이유

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- 실제 모델을 변신시킬 때에 그 형상이 마치 백조 같았고

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- 색이 검은색이어서 생각해 보았다.

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- 'Black Swan' 이란 도저히 일어날 것 같지 않은 일이 일어나는 것을 뜻한다.

- 남들이 불가능해 보인다는 프로젝트를 성공시키고자 하는 열원이 담겨있다.





1. 팀명, 주제 & 선정이유



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주제 : Transformer

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선정 이유

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- 선정한 모델이 기존 로봇에서 자동차로 변신
- 다양한 조인트를 기반으로 그 형상이 변한다고 해서 'Transformer' 라는 프로젝트를 수행하기로 하였다.

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2. Model 선정 & 선정 이유



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2. Model 선정 & 선정 이유



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2. Model 선정 & 선정 이유



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CATIA 기본 기능
충실 + 기본이
바탕이 된 응용

다양한 조인
트를 활용한
Modeling

Kinematics를
이용한 변형
과 화려한
Visual

3. Model 과정

1

(1) 치수 측정

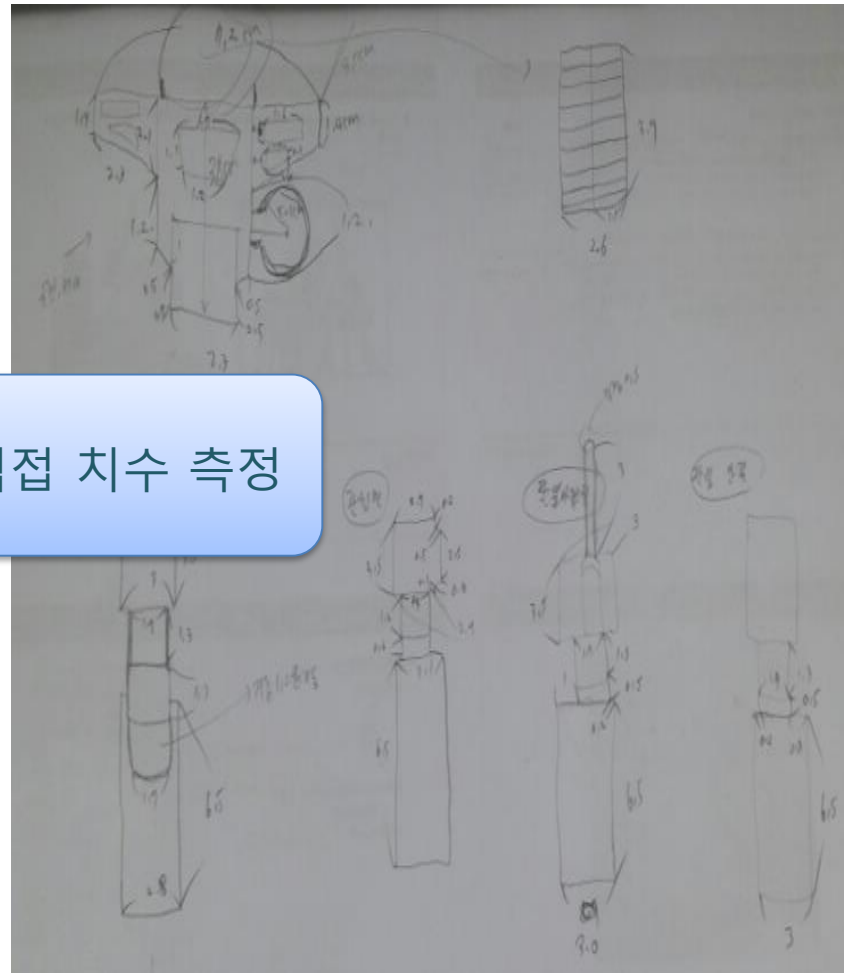
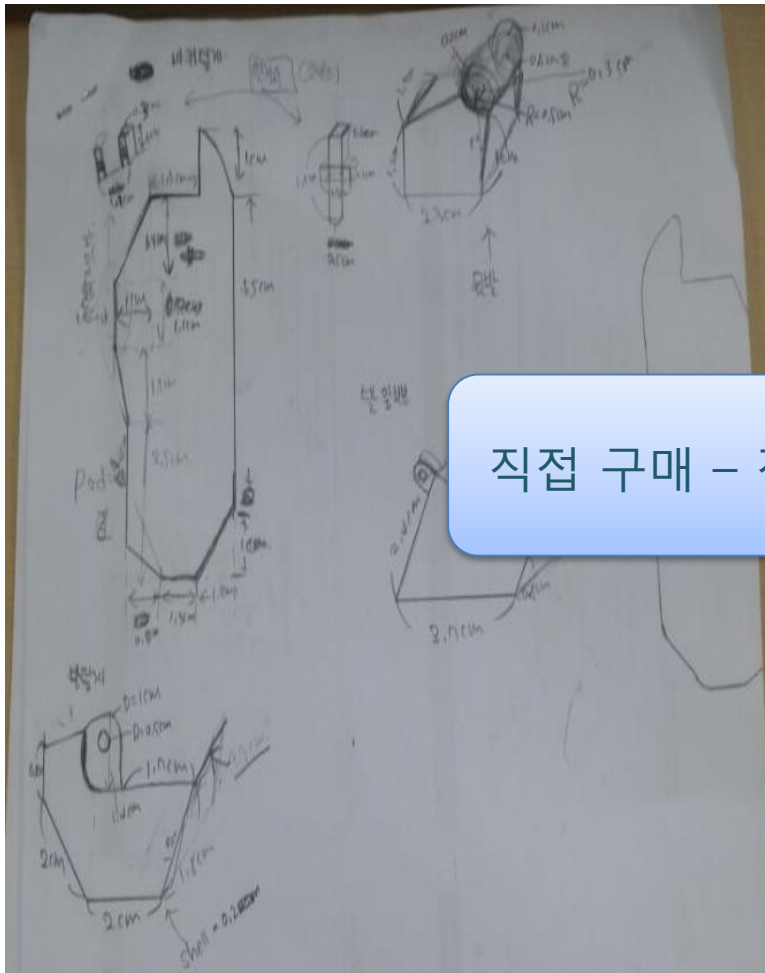
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직접 구매 - 직접 치수 측정

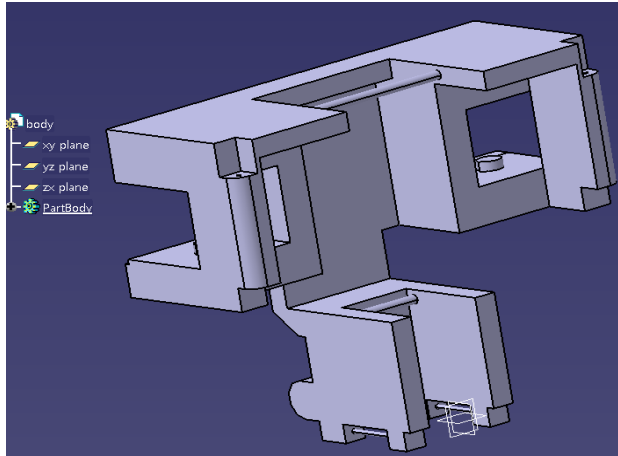
3. Model 과정

1

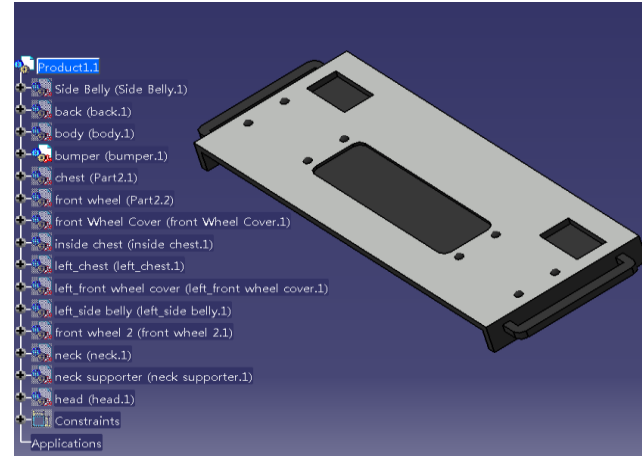
(1) Part Design

2

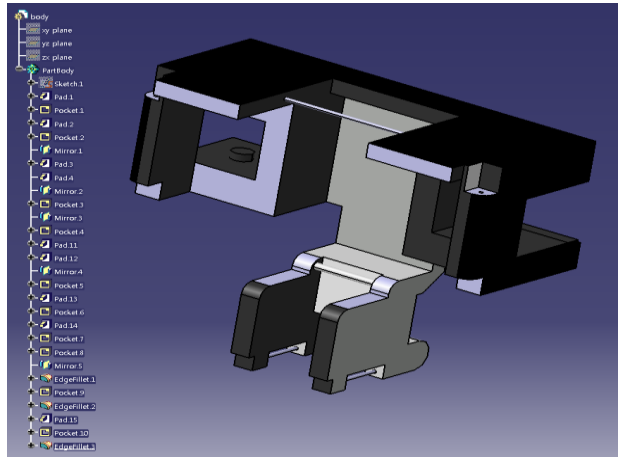
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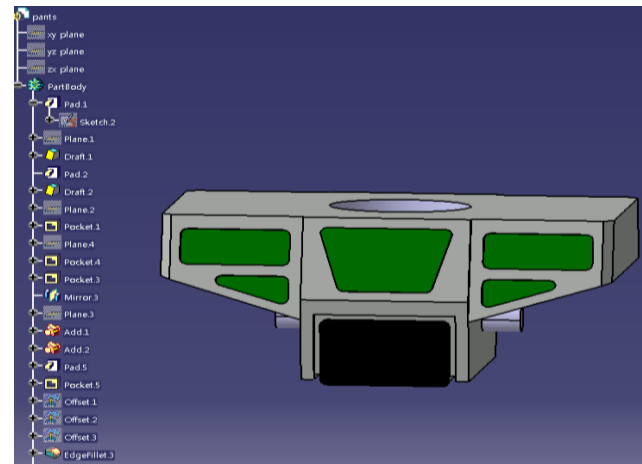
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3. Model 과정

1

(2) Drafting

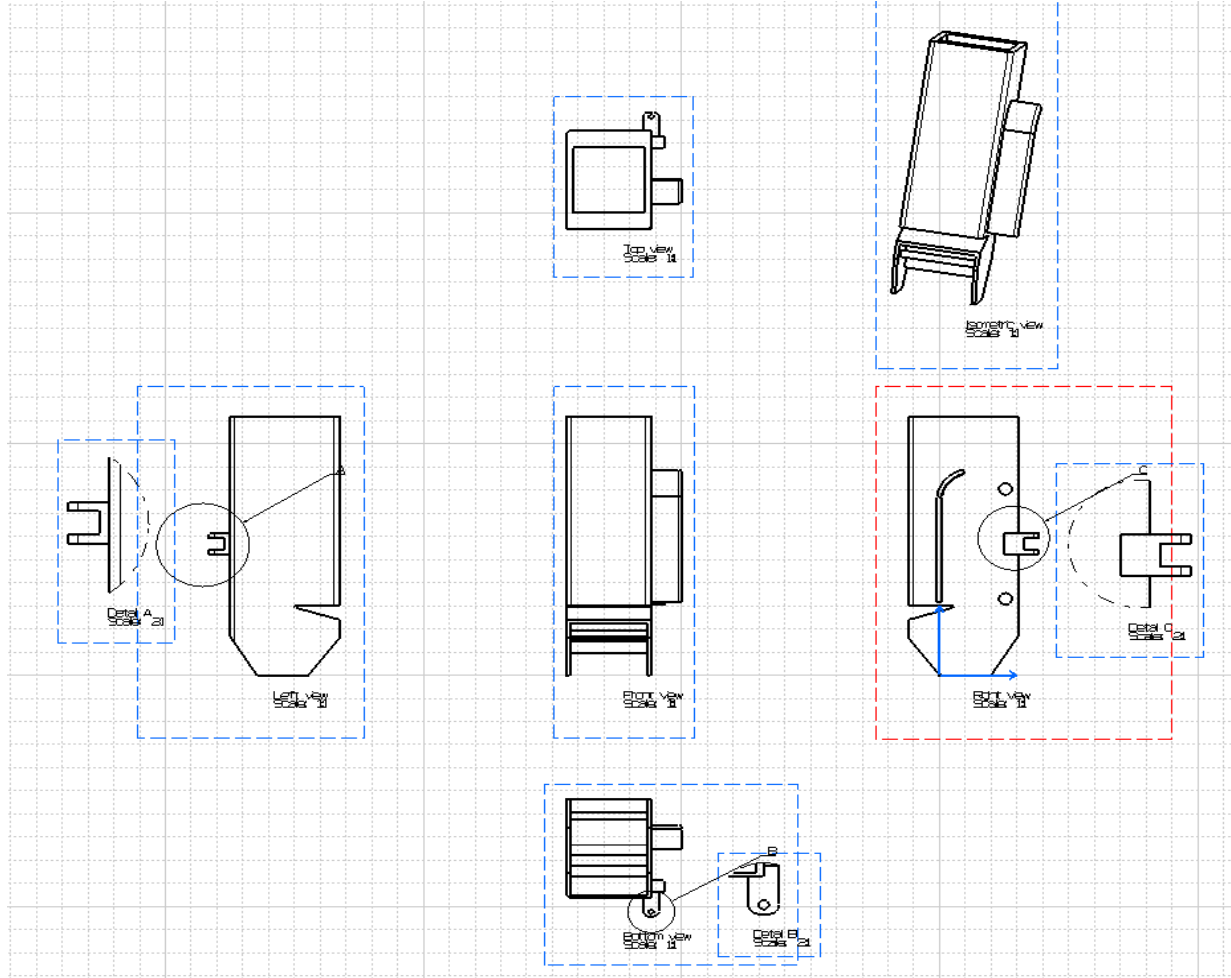
2

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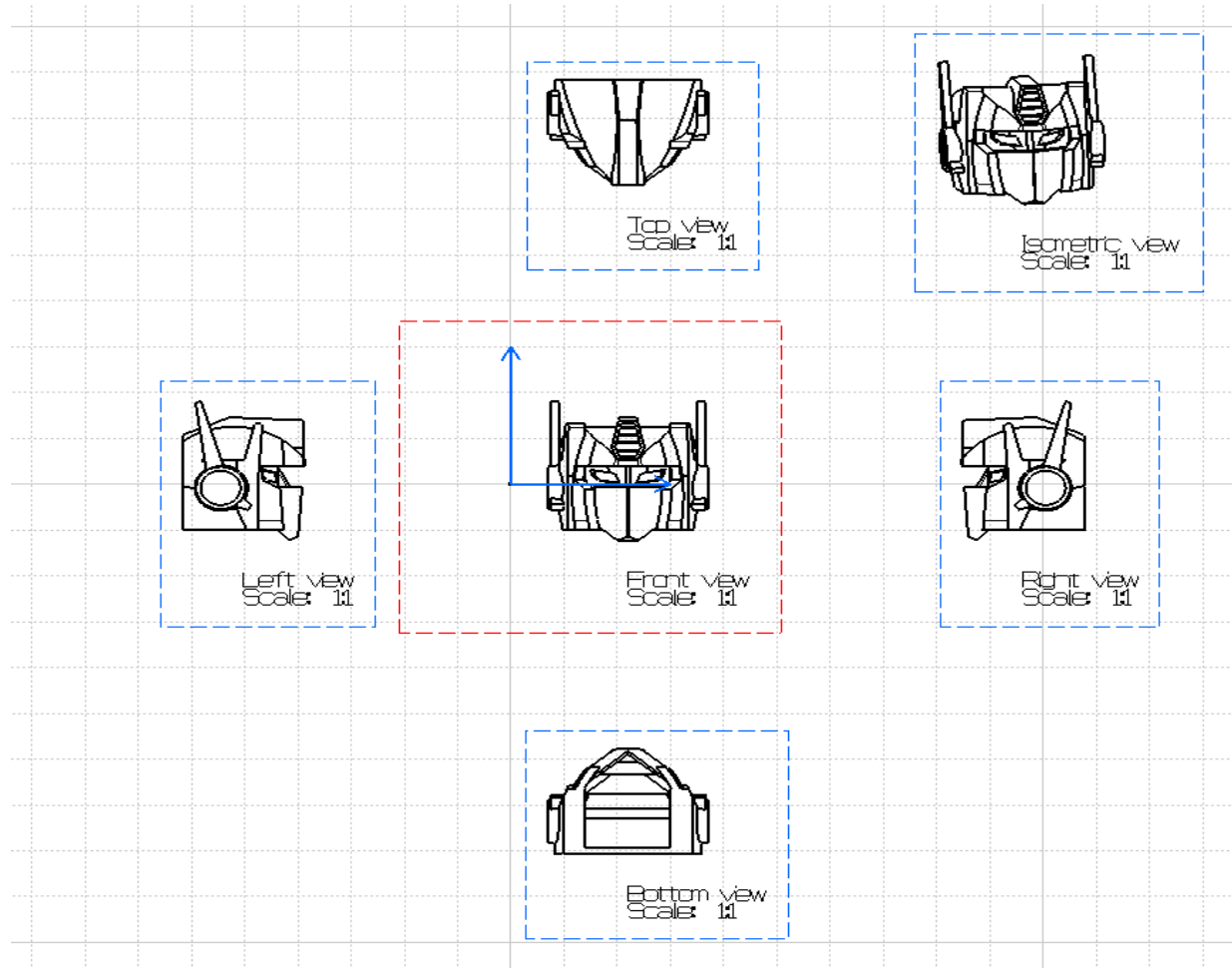
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3. Model 과정

(2) Drafting



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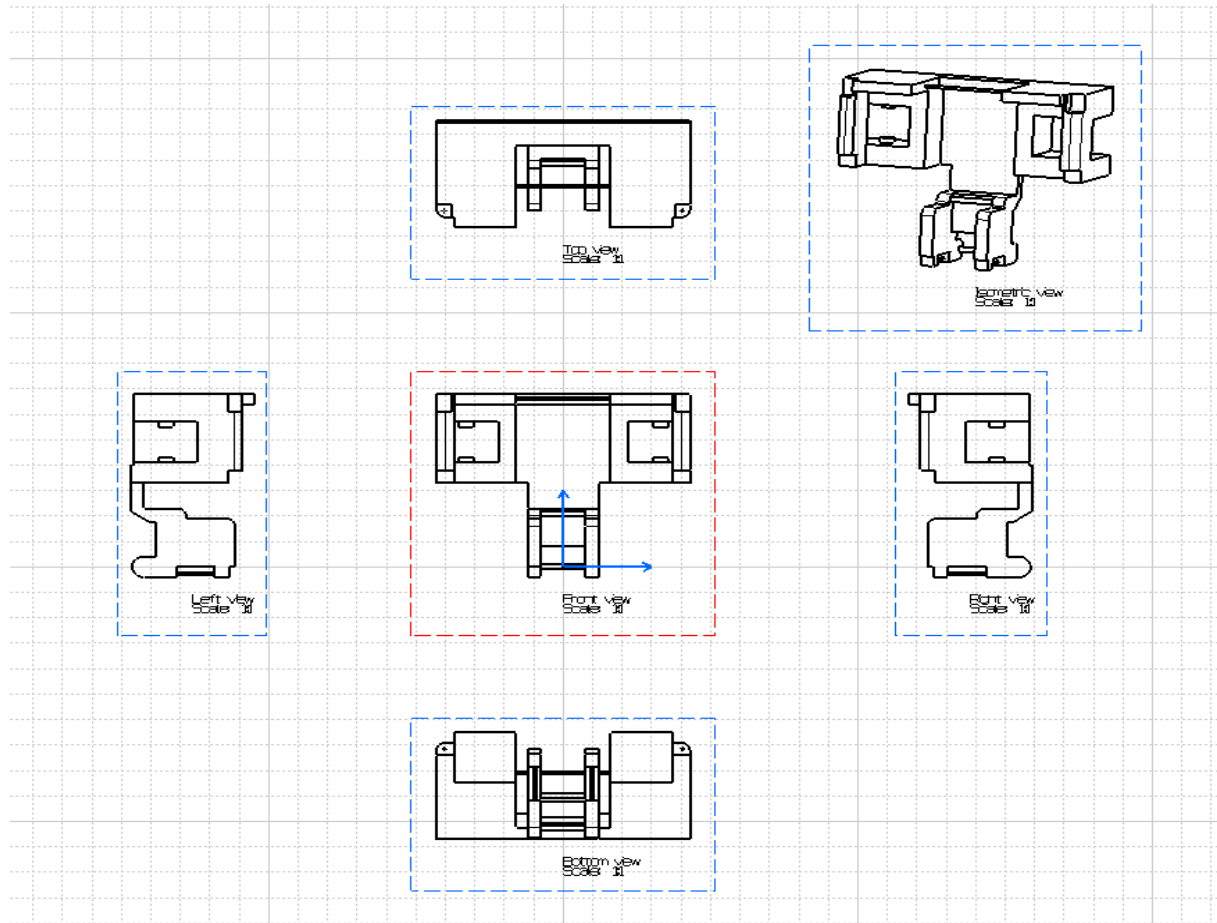
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3. Model 과정

(2) Drafting



3. Model 과정

1

(3) General Shape Design

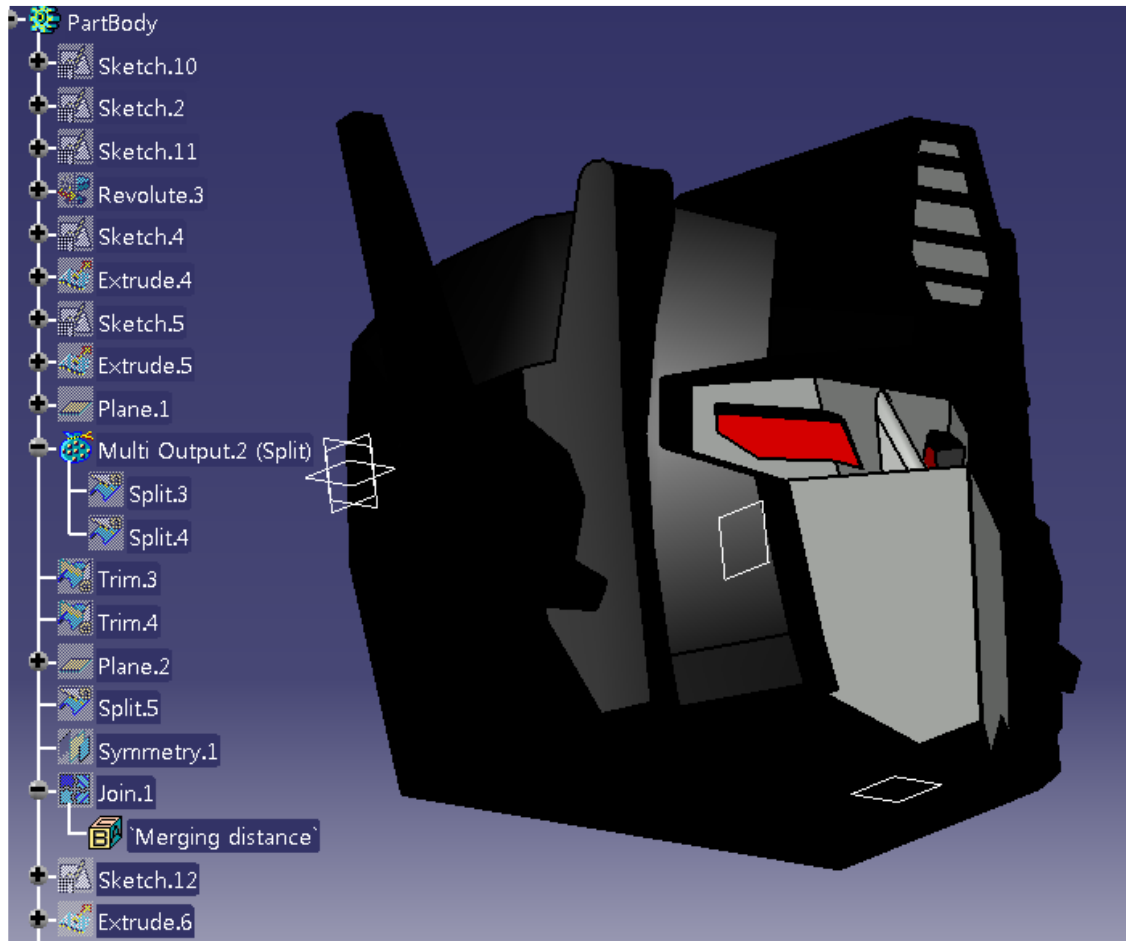
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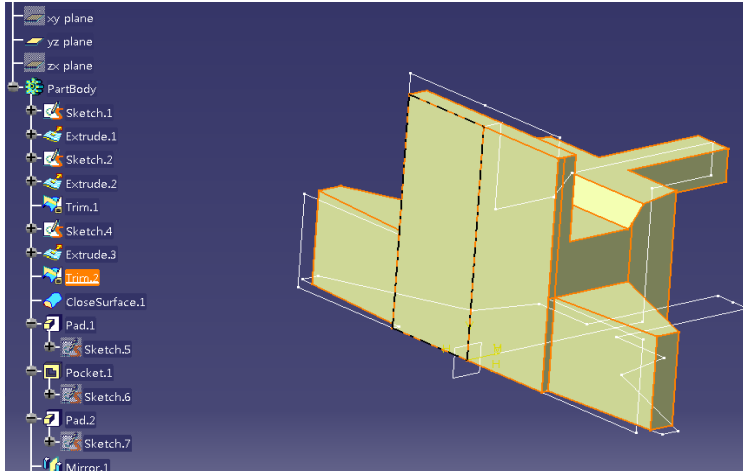
3. Model 과정

1

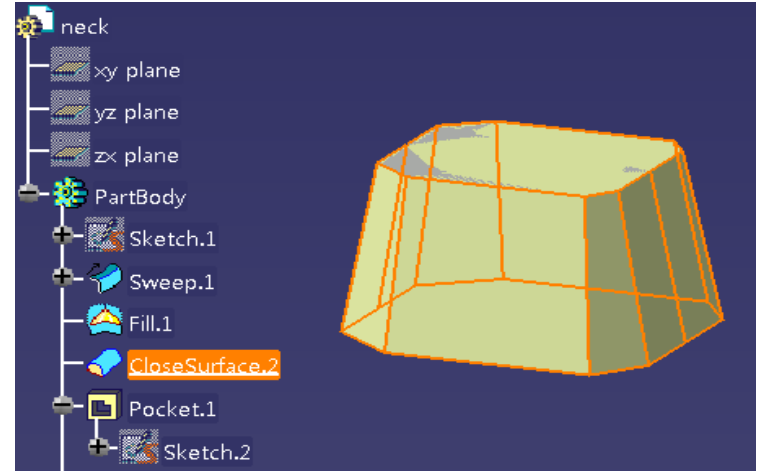
(3) General Shape Design

2

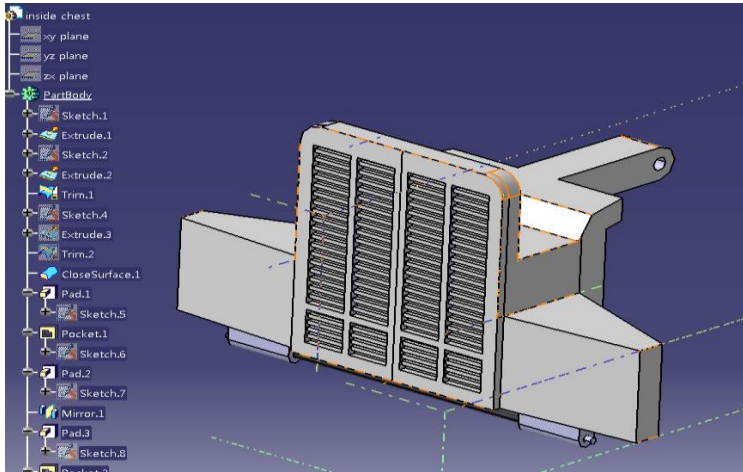
3



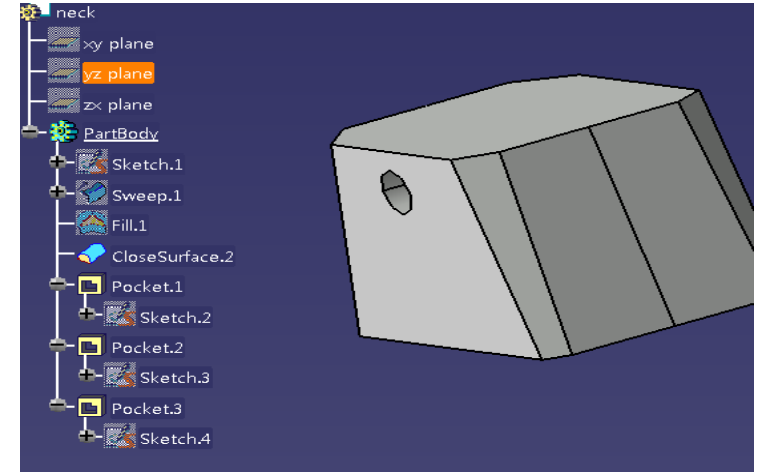
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3. Model 과정

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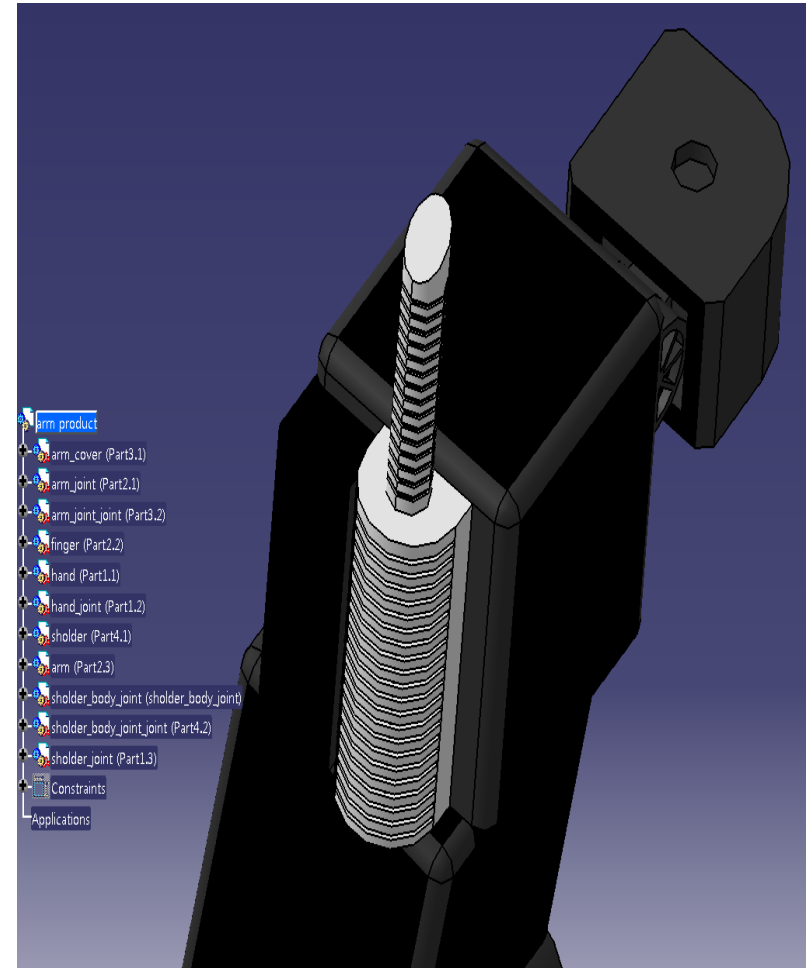
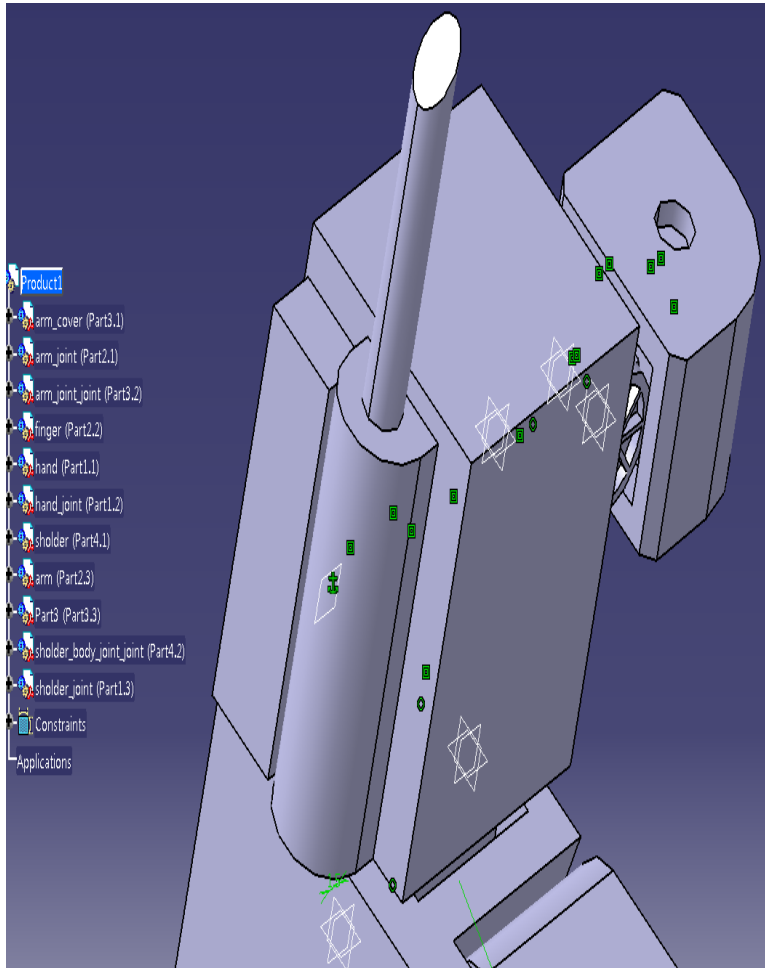
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(3) General Shape Design



3. Model 과정

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(3) General Shape Design

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3. Model 과정

1 (4) Assembly – Leg

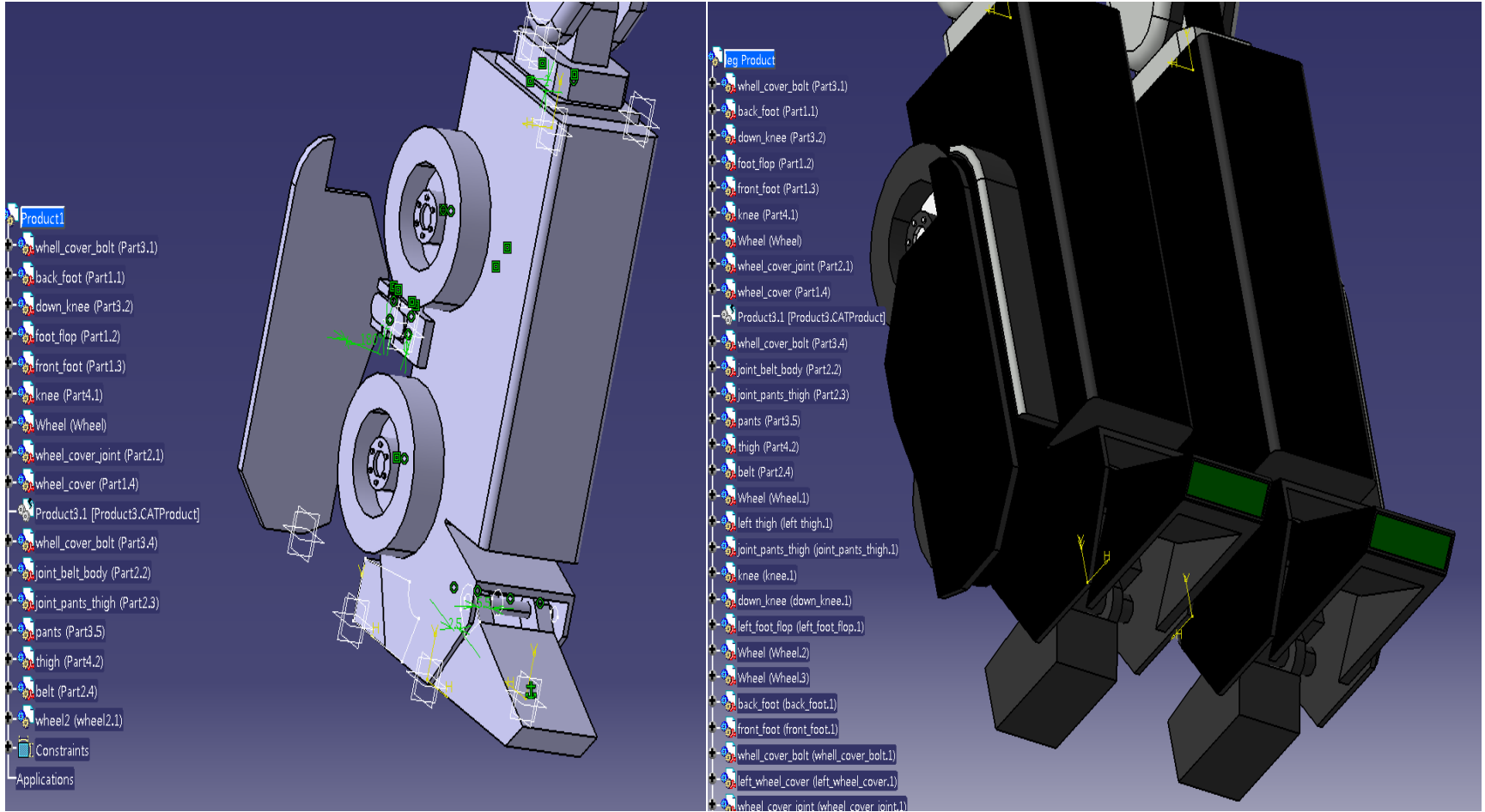
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3. Model 과정

1 (4) Assembly – Arm

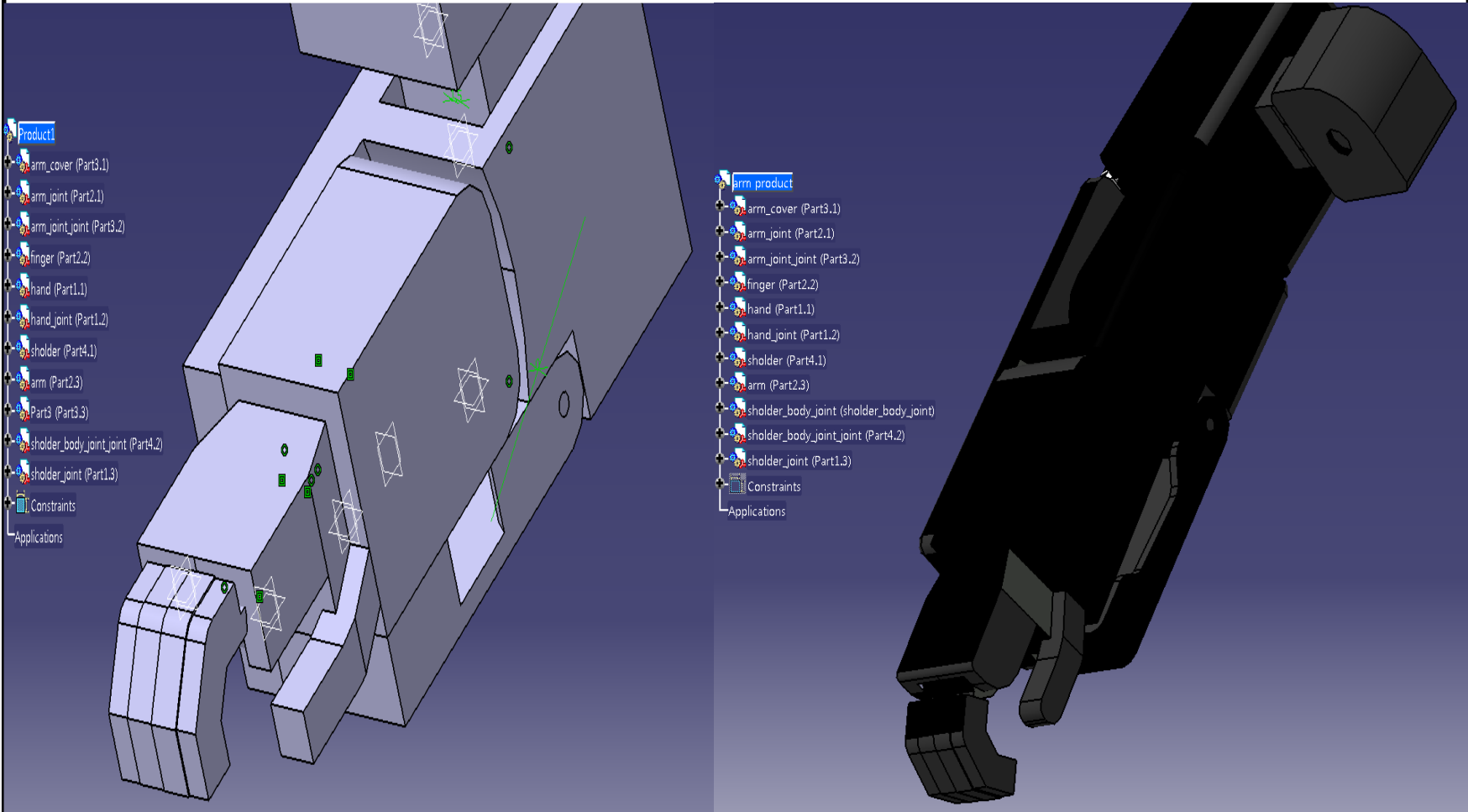
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3. Model 과정

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(4) Assembly- Low Part , Arm

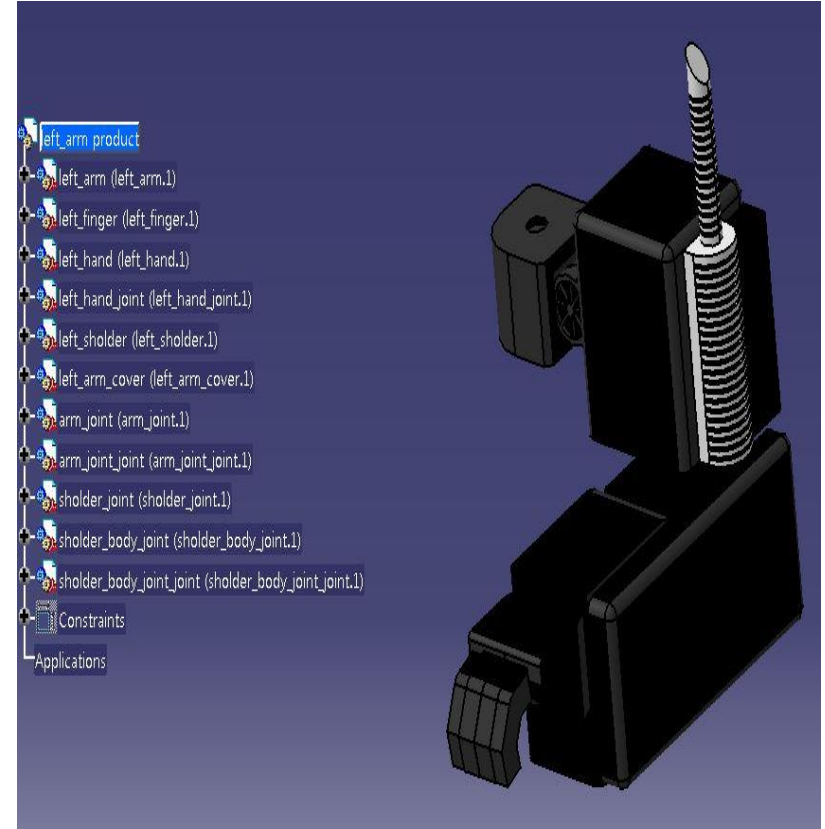
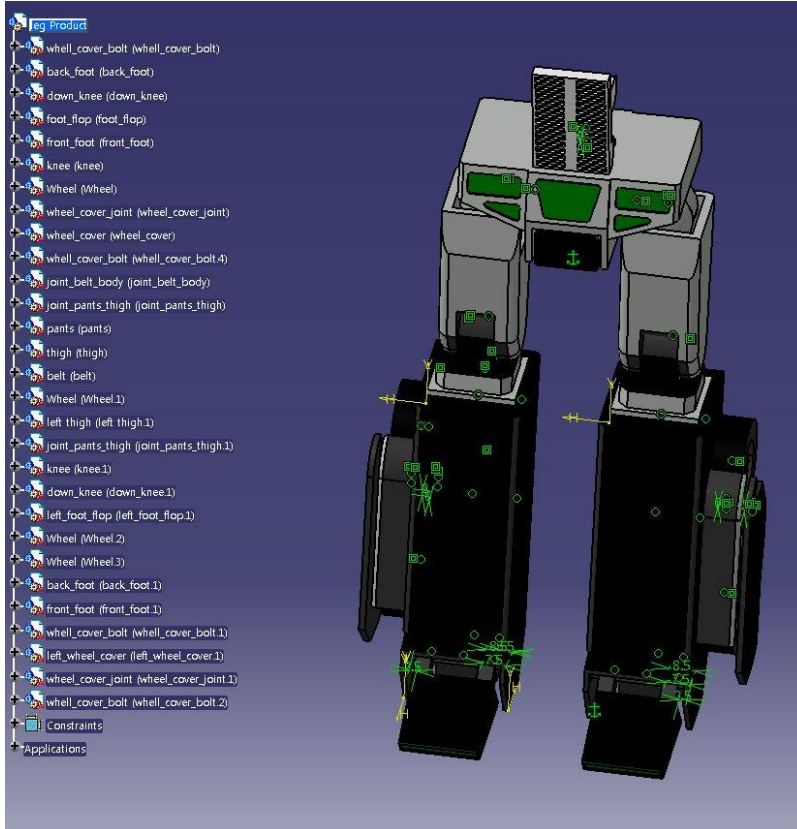
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3. Model 과정

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(4) Assembly -Body

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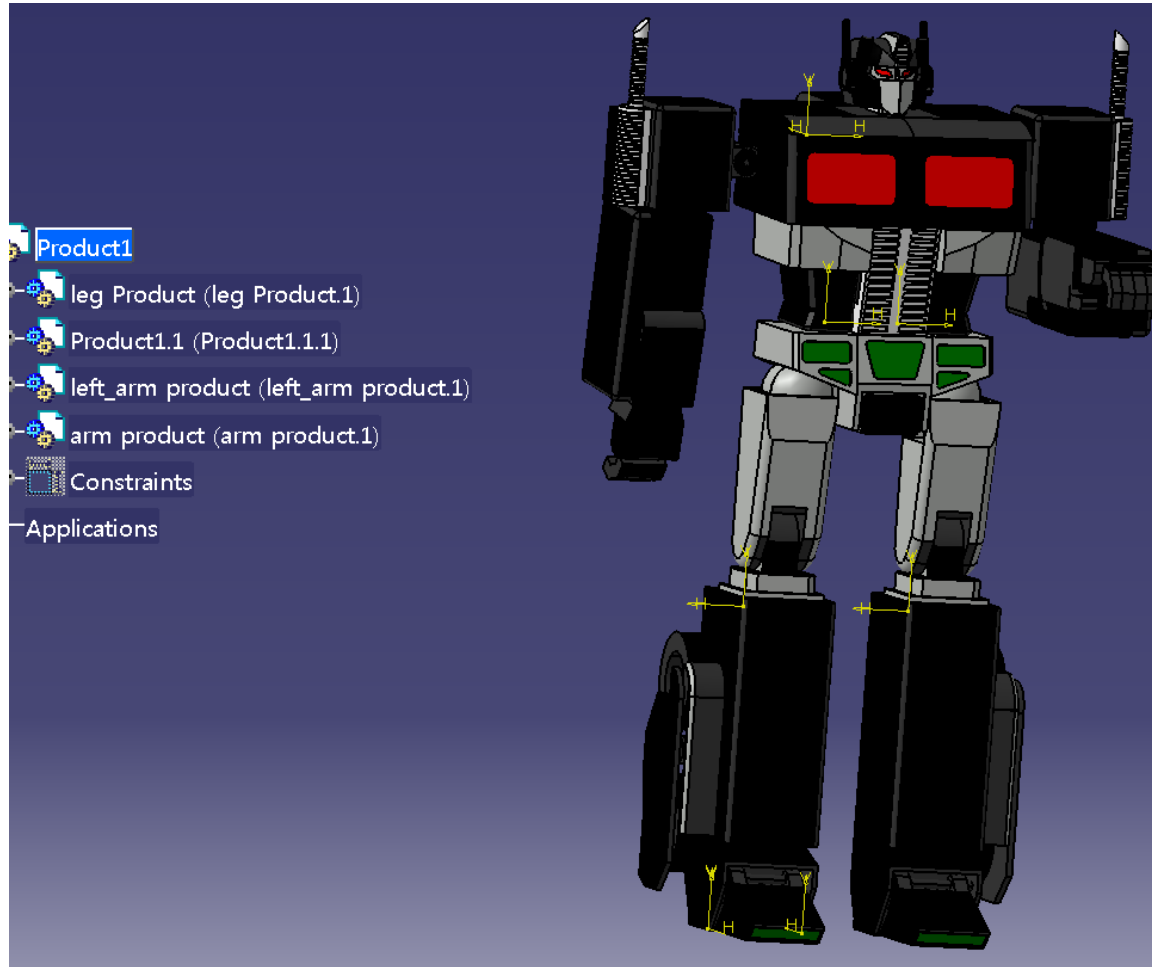
3. Model 과정

1

(4) Assembly- All Product

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4. Kinematic 과정

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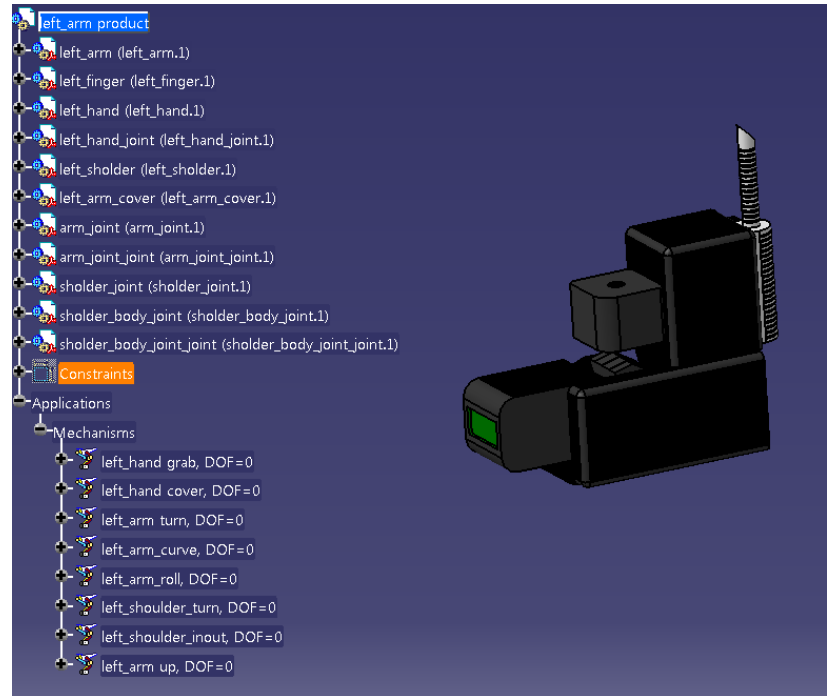
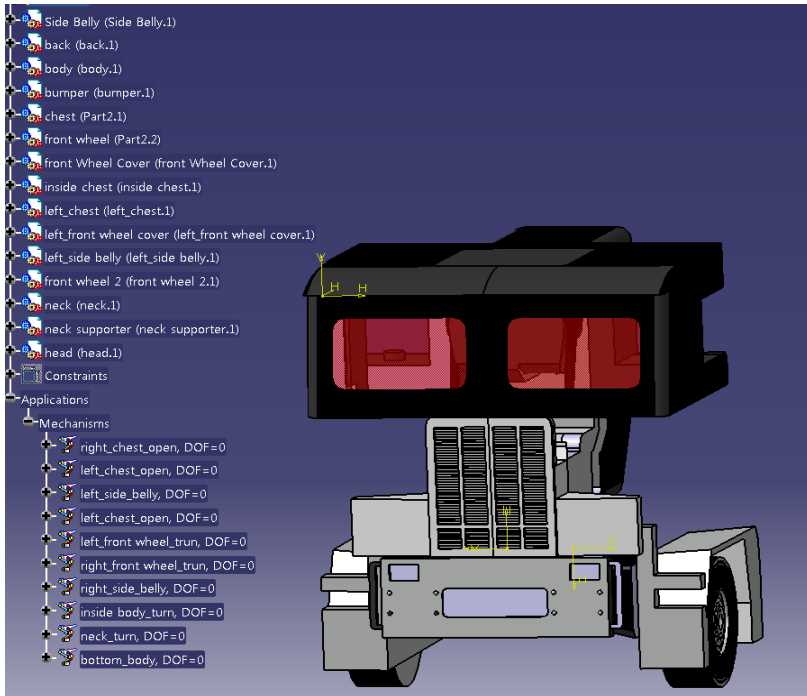
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각각의 Product에서 메커니즘을 만들고 전체 Product에 Import



4. Kinematic 과정

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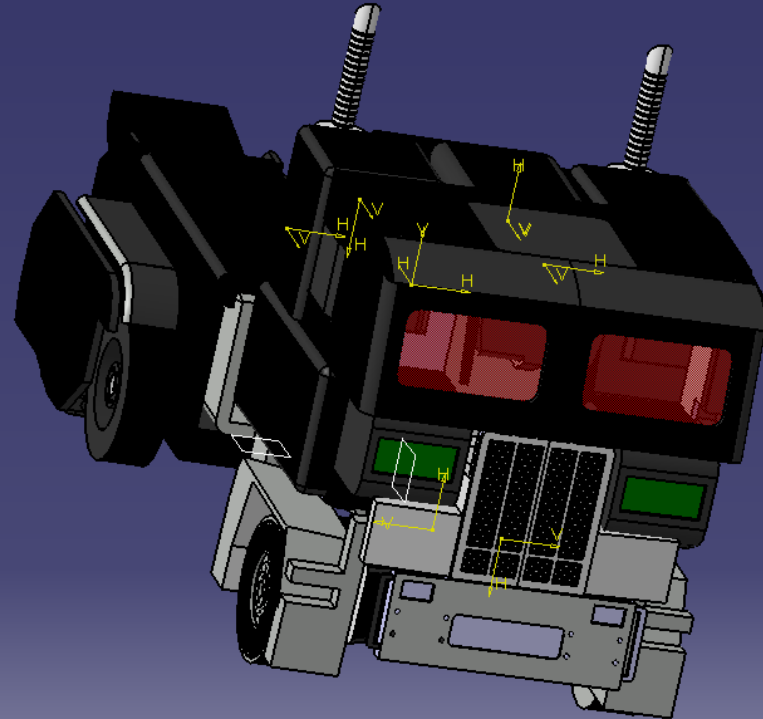
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- Mechanisms
 - right_foot flop_front foot, DOF=0
 - right_foot flop_back foot, DOF=0
 - left_foot flop_front foot, DOF=0
 - left_foot flop_back foot, DOF=0
 - right_knee_foot flop, DOF=0
 - left_knee_foot flop, DOF=0
 - right_pants_ thigh joint, DOF=0
 - belt_pants_turning, DOF=0
 - upping_body, DOF=0
 - baking_body, DOF=0
 - right_arm_turning, DOF=0
 - left_arm_turning, DOF=0
 - left_arm product.1\left_arm_cover_turn (Imported), DOF=0
 - left_arm product.1\left_arm_hand_grab (Imported), DOF=0
 - left_arm product.1\left_arm_trun (Imported), DOF=0
 - left_arm product.1\left_arm_connect up (Imported), DOF=0
 - left_arm product.1\left_arm_joint_turn (Imported), DOF=0
 - Product1.1\right_chest_open (Imported), DOF=0
 - Product1.1\left_chest_open (Imported), DOF=0
 - Product1.1\left_side_belly (Imported), DOF=0
 - Product1.1\left_chest_open (Imported), DOF=0
 - Product1.1\left_front_wheel_trun (Imported), DOF=0
 - Product1.1\right_front_wheel_trun (Imported), DOF=0
 - Product1.1\right_side_belly (Imported), DOF=0
 - Product1.1\inside_body_turn (Imported), DOF=0
 - Product1.1\neck_turn (Imported), DOF=0
 - left_arm product.1\left_sholder_connect (Imported), DOF=0
 - left_arm product.1\left_arm_hand_grab (Imported), DOF=0
 - left_arm product.1\left_arm_hand_cover (Imported), DOF=0
 - left_arm product.1\left_arm_turn (Imported), DOF=0
 - left_arm product.1\left_arm_curve (Imported), DOF=0
 - left_arm product.1\left_arm_roll (Imported), DOF=0
 - left_arm product.1\left_shoulder_turn (Imported), DOF=0
 - left_arm product.1\left_shoulder_inout (Imported), DOF=0
 - left_arm product.1\left_arm_up (Imported), DOF=0
 - arm product.1\right_hand_grab (Imported), DOF=0
 - arm product.1\right_hand_cover (Imported), DOF=0
 - arm product.1\right_arm_turn (Imported), DOF=0
 - arm product.1\right_arm_curve (Imported), DOF=0
 - arm product.1\right_arm_roll (Imported), DOF=0
 - arm product.1\right_shoulder_turn (Imported), DOF=0
 - arm product.1\right_shoulder_inout (Imported), DOF=0
 - arm product.1\right_arm_up (Imported), DOF=0
 - Product1.1\bottom_body (Imported), DOF=0



4. Kinematic 과정(Robot->Car)

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4. Kinematic 과정(Car->Robot)

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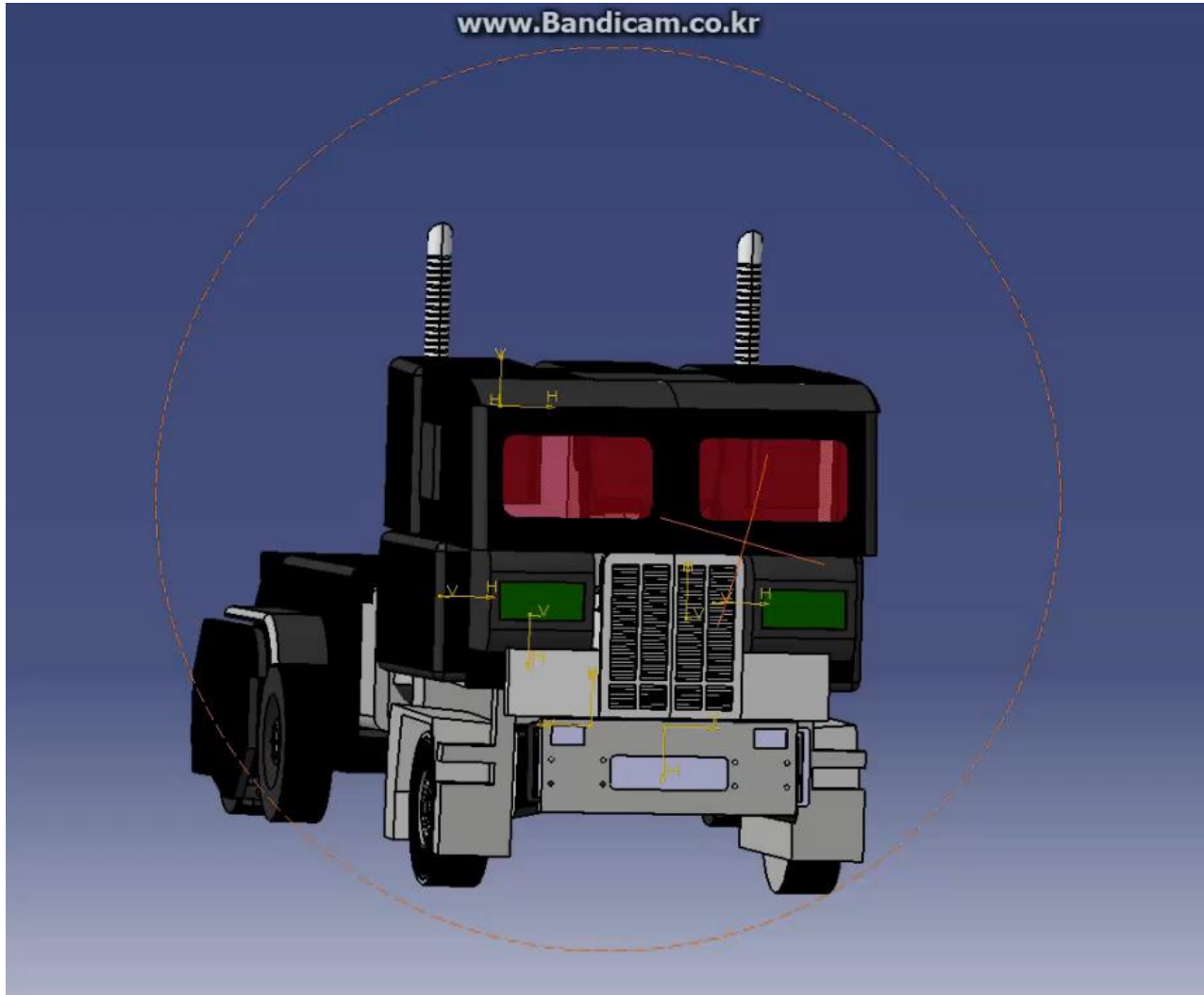
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4. Kinematic 과정(직립보행)



1

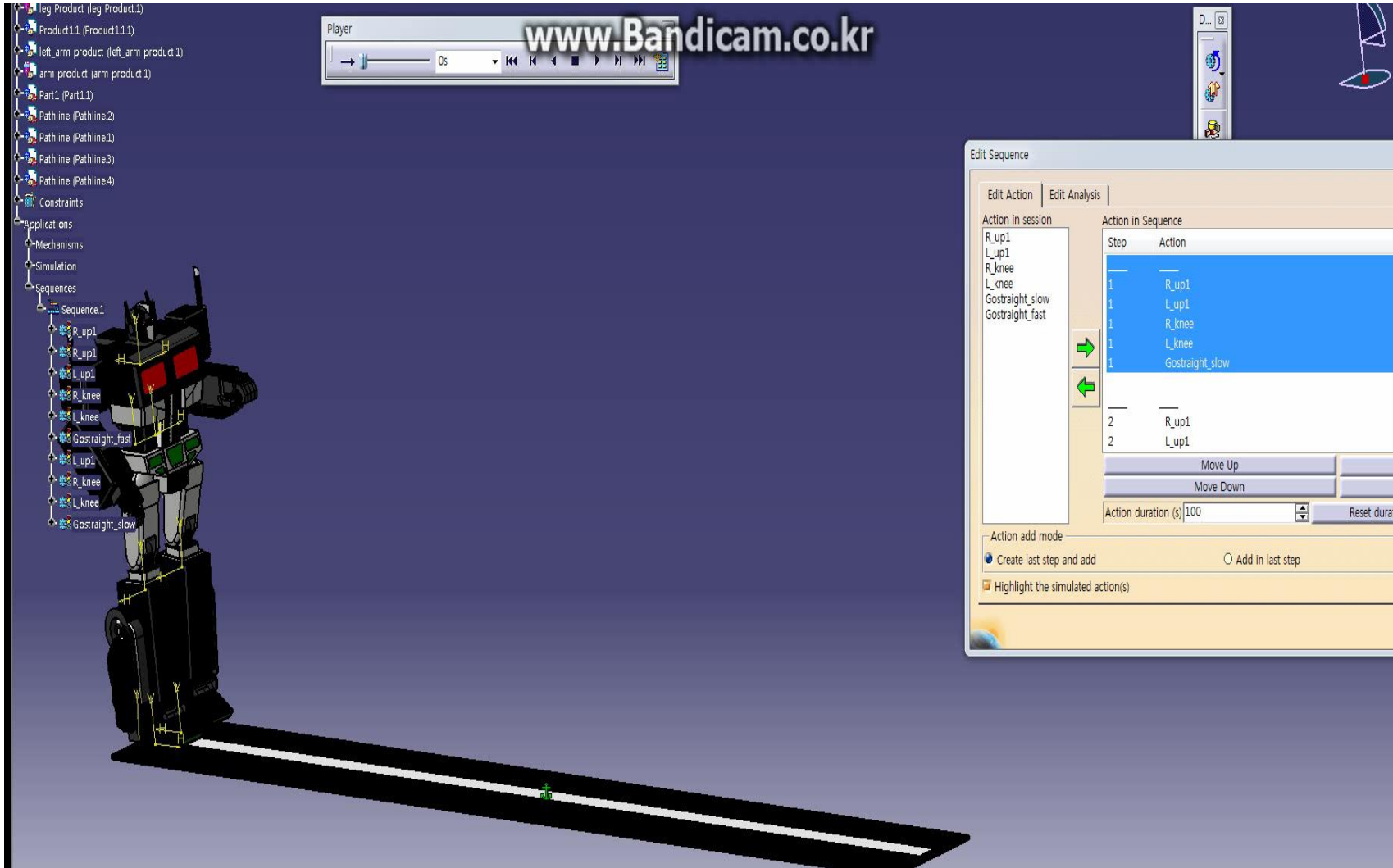
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5. 프로젝트 후기

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남들이 하지 못 할거라고 하였던 것을 해내서 많은 성취감을 느낌.

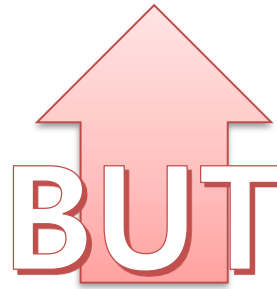
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실제제품의 조인트가
상상이상으로 많아서,
모델링 과정에서
많은 어려움을 겪었다.


BUT

6

'역공학' 과정을 통하여
제품을 모델링 하였는
데, 이 과정에서 오랜
시간이 소요되었다.

실제품의 변신과정이
매우 복잡하여
약 50개 키네마틱스가
필요하였고 시뮬레이션을
합치는 과정이 힘들었다.

6. Q & A

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THANK YOU

