2023 Winter MESTER

2024/02/15 Meeting

Tilt-Rotor VTOL Modeling and Control

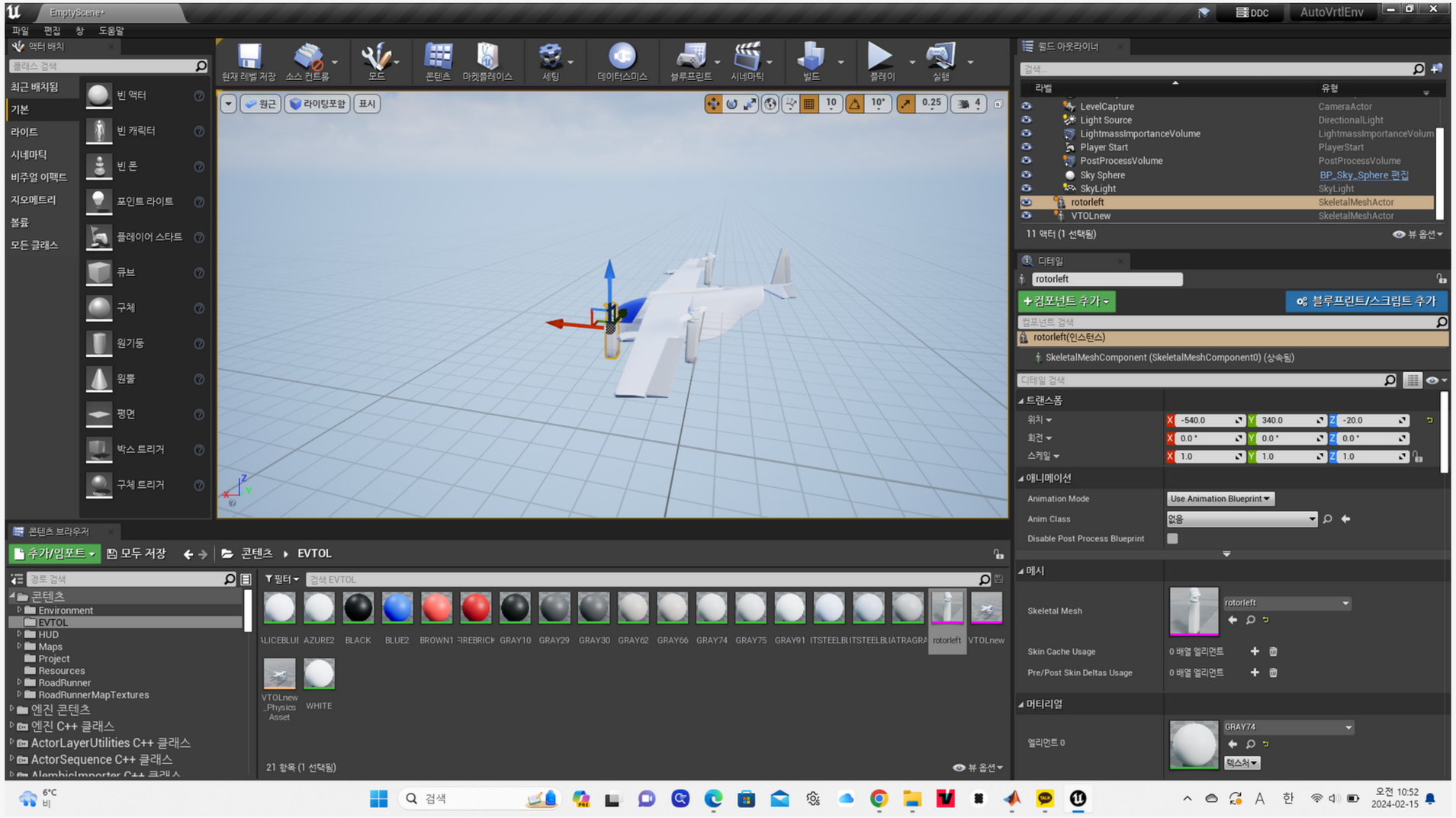
20210027 김지유
20193770 우영찬

01.
목차

지난 연구 요약

지난 연구 요약

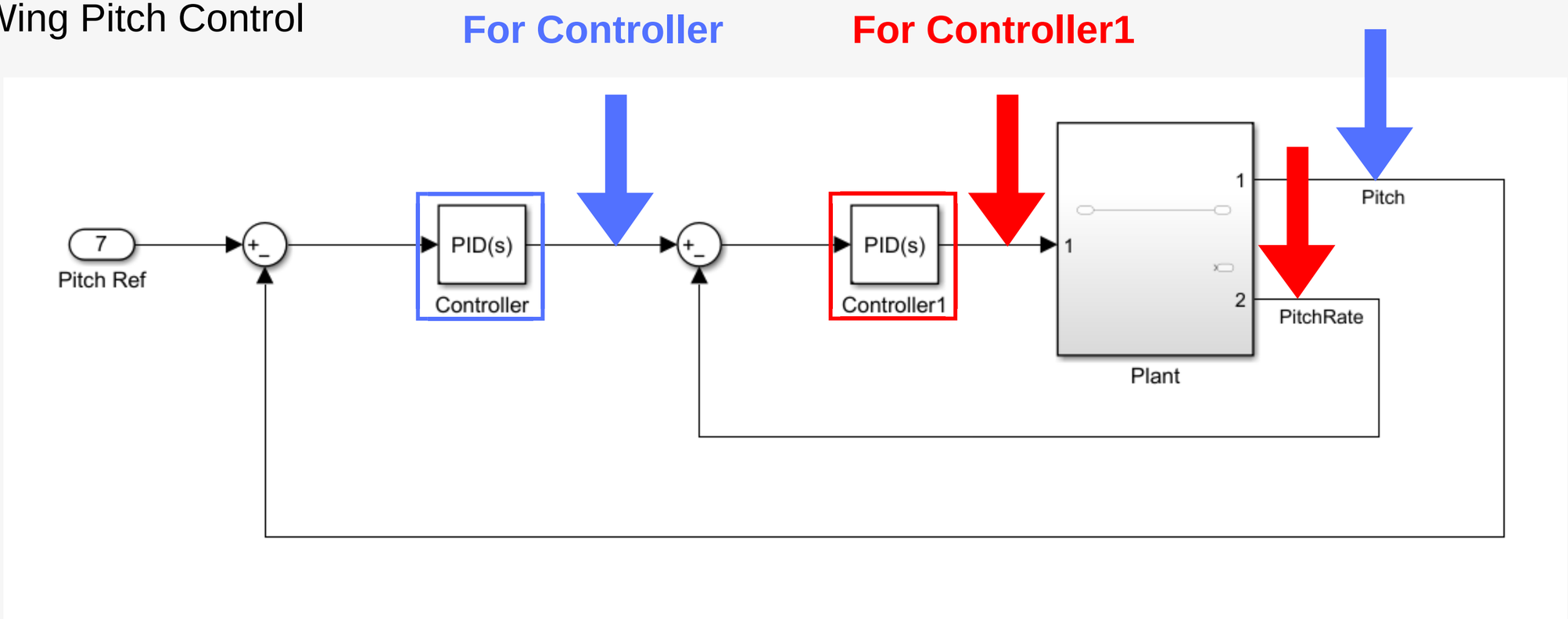
UnrealEngine



지난 연구 요약

PID 튜닝

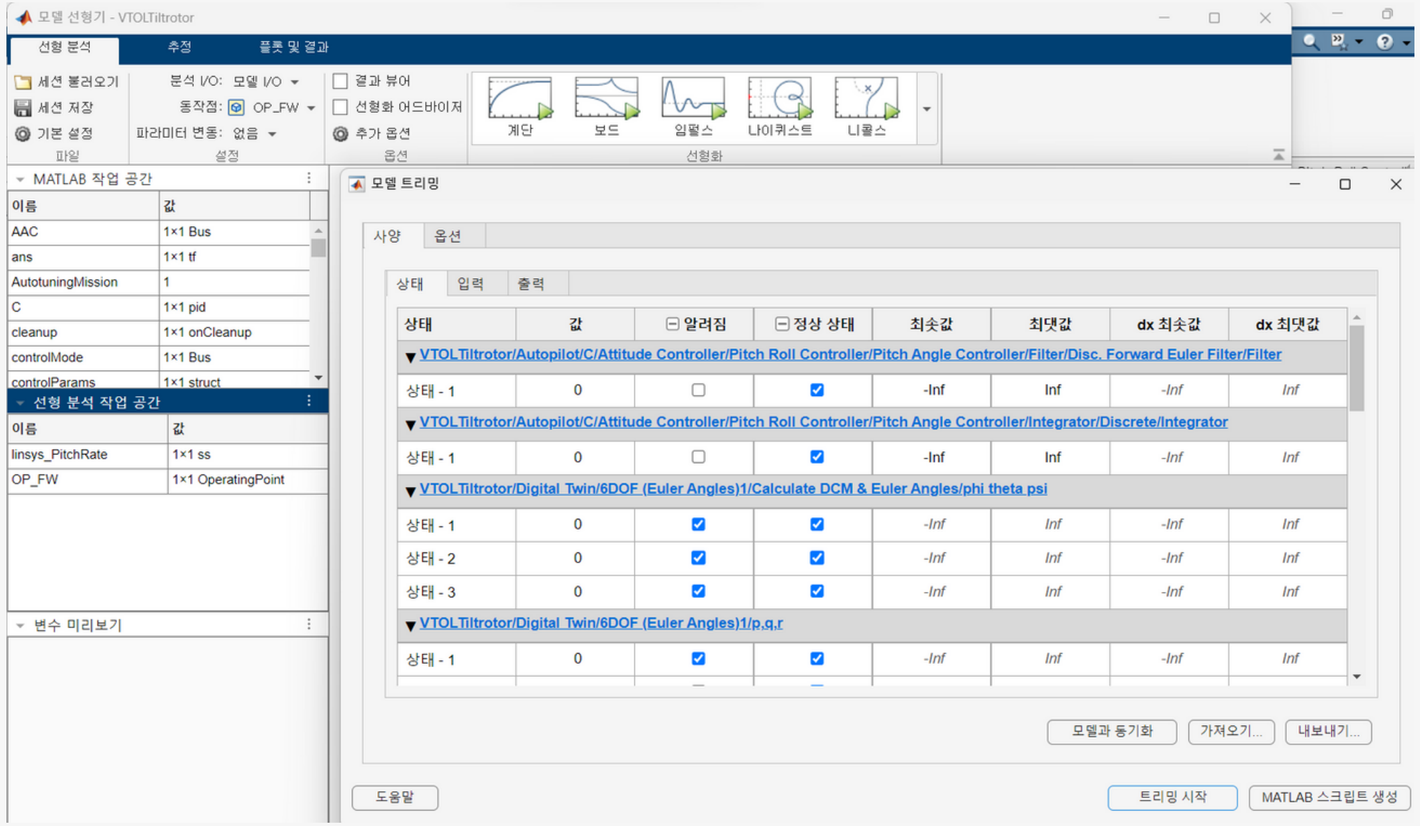
FixedWing Pitch Control



PID control을 위해 plant의 transfer function 필요

지난 연구 요약

PID 튜닝



SIMULINK 모델선형기 앱

모델 트리밍 -> 선형화

선형화 input: Elevator
output: PitchRate

지난 연구 요약

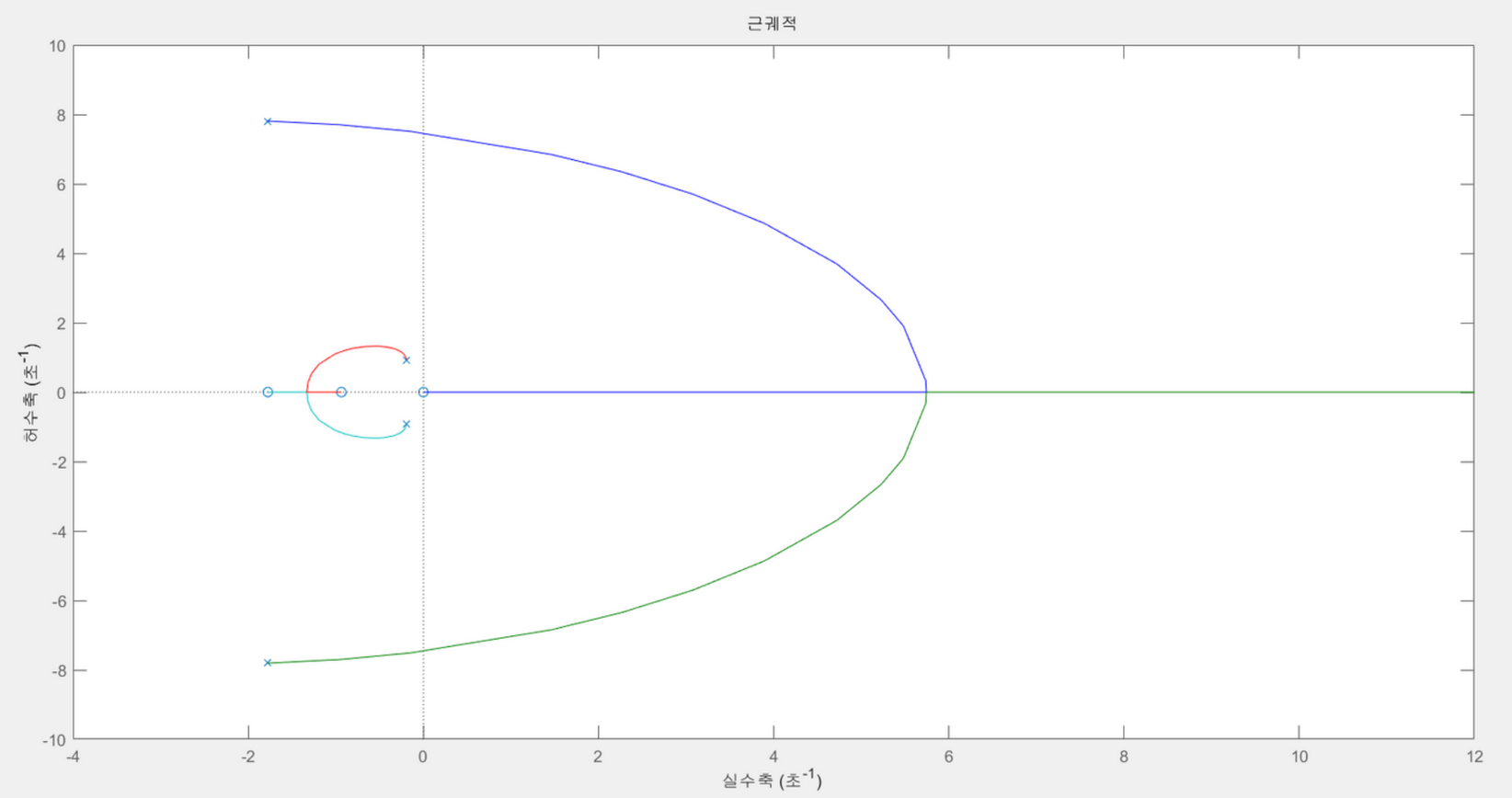
PID 튜닝

Plant의 transfer function

```
sys =

  -64.67 s^3 - 175.3 s^2 - 107.4 s - 6.117e-11
  ---------------------------------------------
  s^4 + 3.95 s^3 + 66.41 s^2 + 28.11 s + 57.24
```

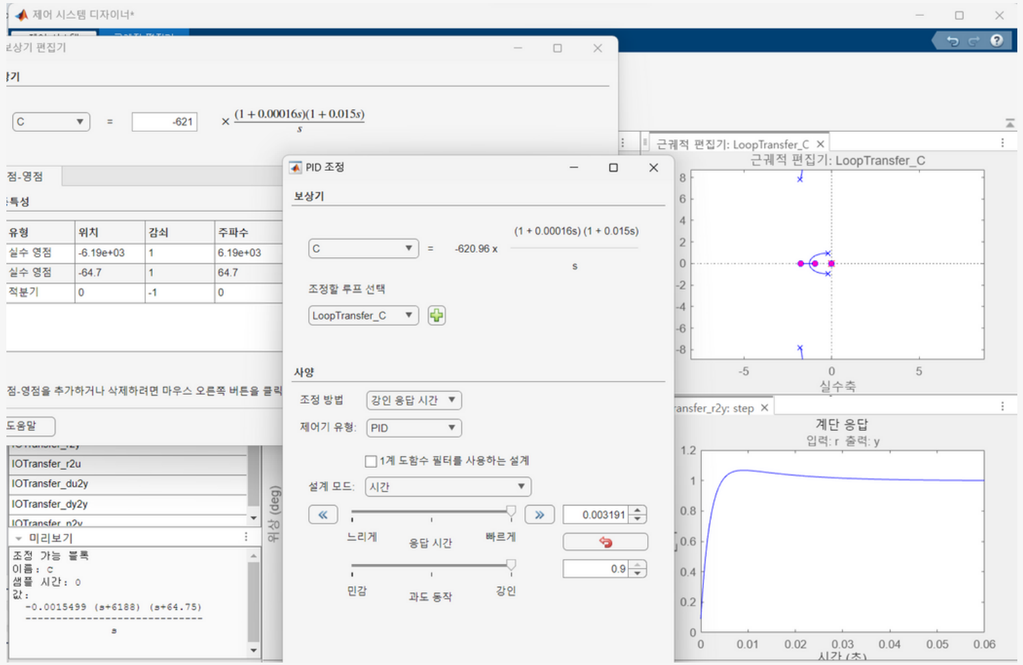
```
sys=tf([-64.67 -175.3 -107.4 -6.117e-11],[1 3.95 66.41 28.11 57.24]);
[r,k]=rlocus(sys);
rlocus(sys,k)
```



지난 연구 요약

Trim

FixedWing Controller Tuning



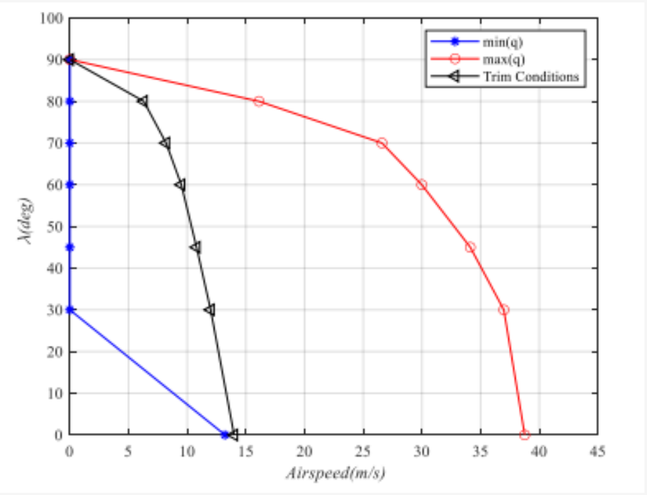
<이중 PID Tuning>

Transition

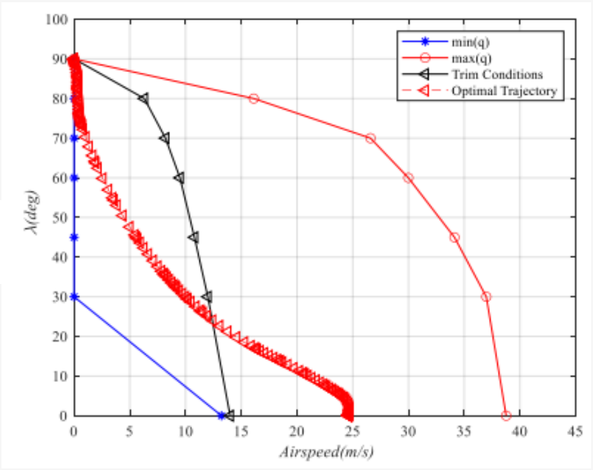
Tilt Corridor

TRIM CONDITIONS WITH DIFFERENT TILTING ANGLES

Tilting angle(deg)	*Airspeed (m/s)*	*Mode*
0	14	Fixed-wing
30	12	Transition
45	10.8	
60	9.5	
70	8.2	
80	6.3	
90	0.01	quadrotor

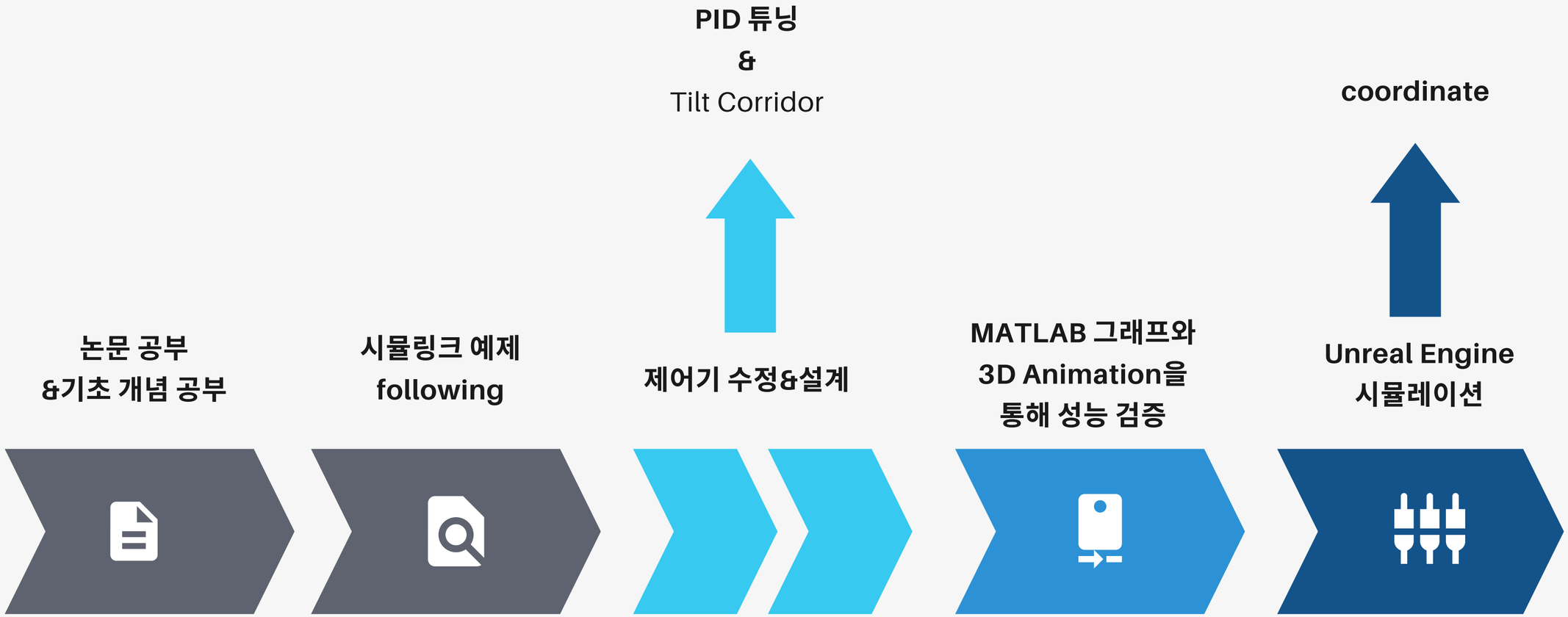


$$J_c = c \bullet t + \int_{t_0}^{t_f} x_1 \bullet \sum T_i + x_2 \bullet \dot{\lambda}^2 + x_3 \bullet \delta_e^2$$



연구 목표

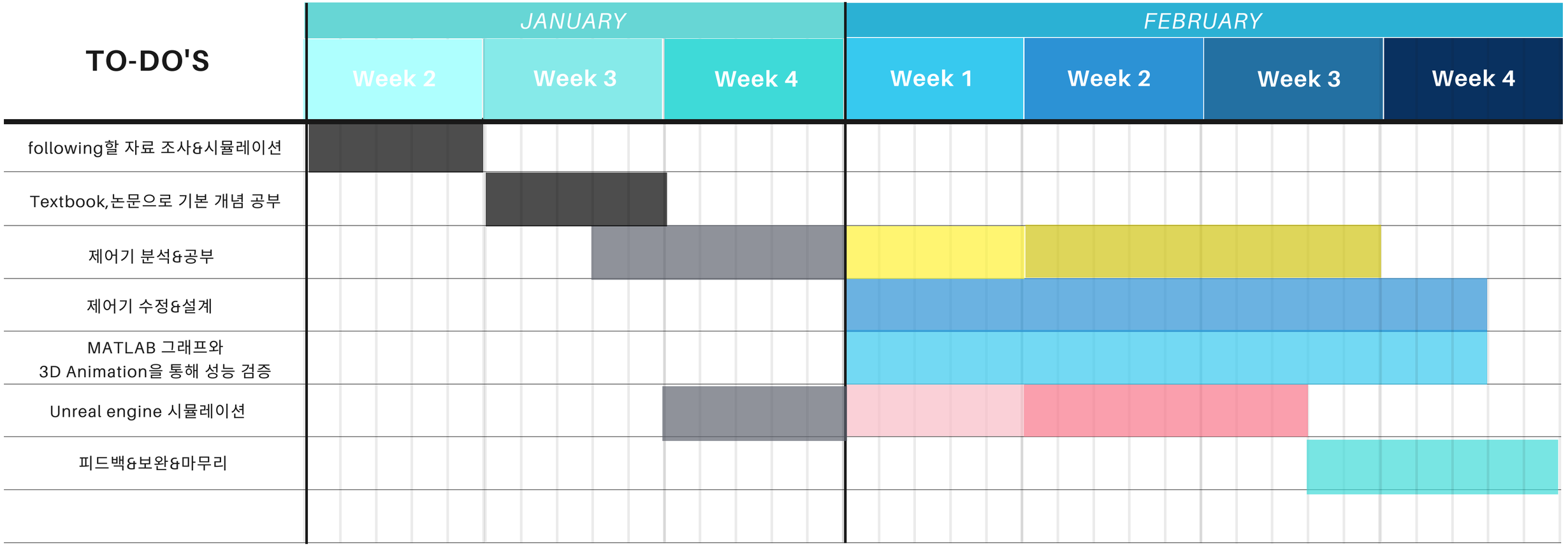
연구 목표


논문 공부
&기초 개념 공부
시뮬링크 예제
following
PID 튜닝
&
Tilt Corridor
제어기 수정&설계
MATLAB 그래프와
3D Animation을
통해 성능 검증
coordinate
Unreal Engine
시뮬레이션

스케줄

gantt chart

Schedule

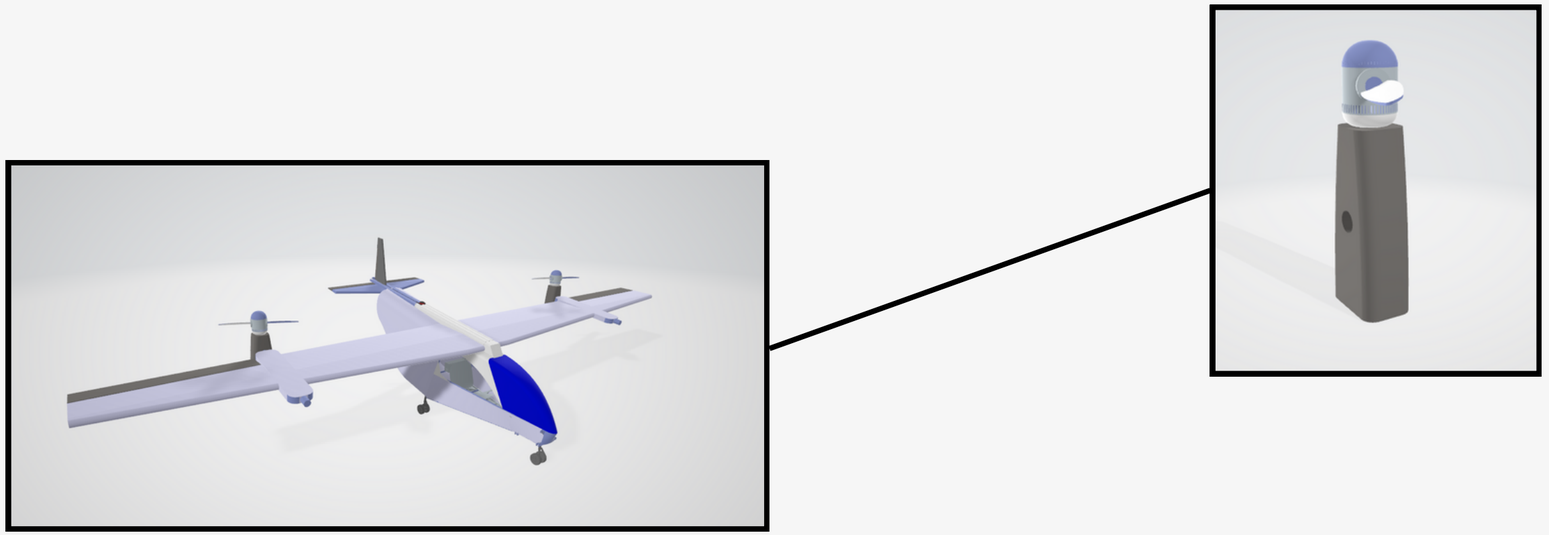


현재 연구 논의 내용

현재 연구 논의 내용

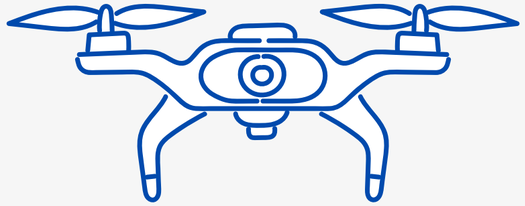
1.Tuning&tilt corridor

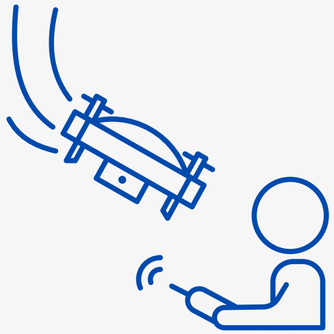
2.coordinate



문의 사항

문의사항
Q&A





시간적 제약>”집중할 부분“

감사합니다