Meeting Materials for QDrone Project
Regular Internal Meeting

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Jan 7 2019

4PM at PSE 312

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Gunho Sohn

Prerequisites for Pursuing Project

❑ Software
- Matlab
- C++
- Ubuntu
- ROS

❑ Theory (for backend: state estimation from sensor measurement)
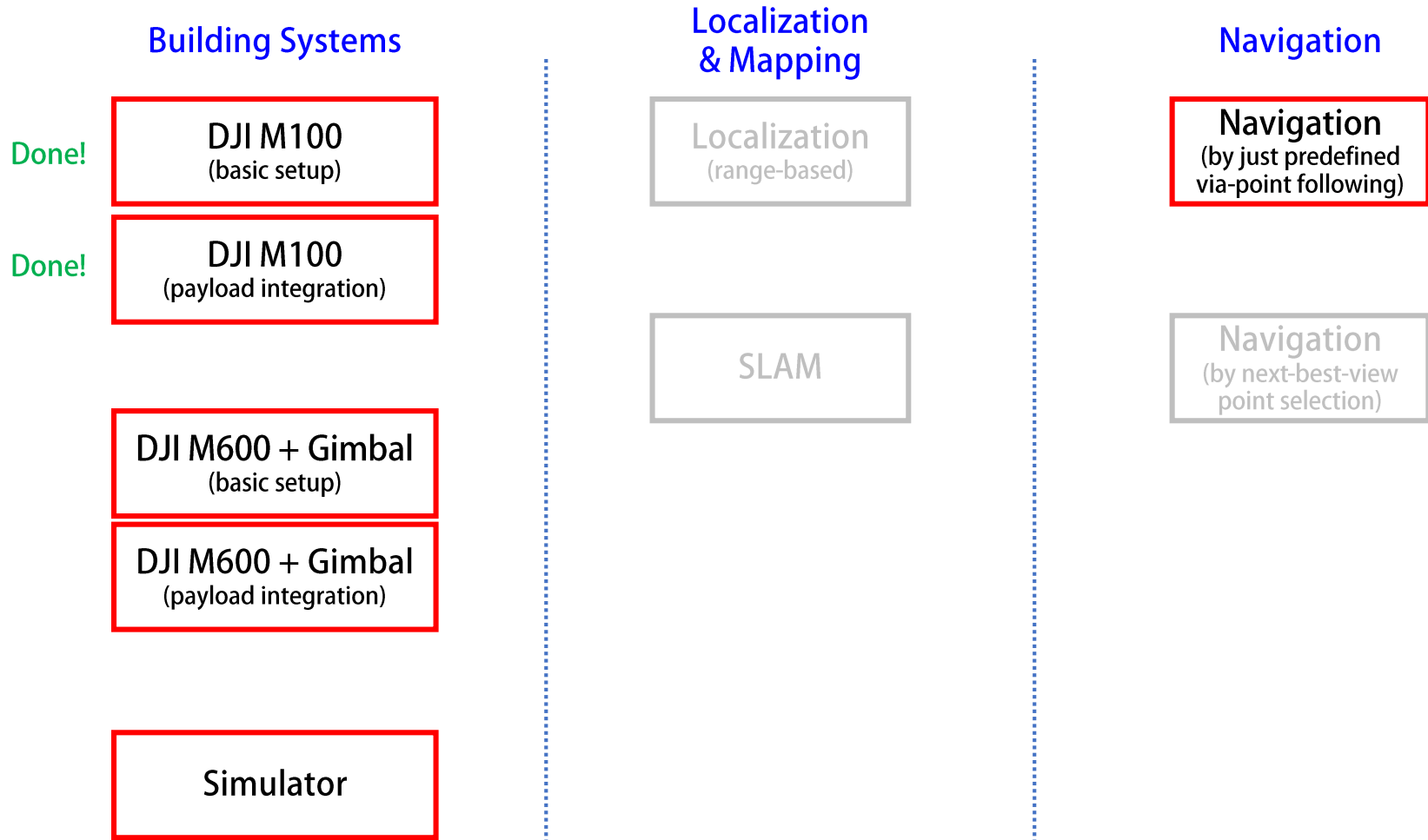- EKF
- MSCKF
- Smoothing

❑ Sensor
- GPS
- IMU
- Camera
- LiDAR

Tasks

❑ Task 0: Building Systems

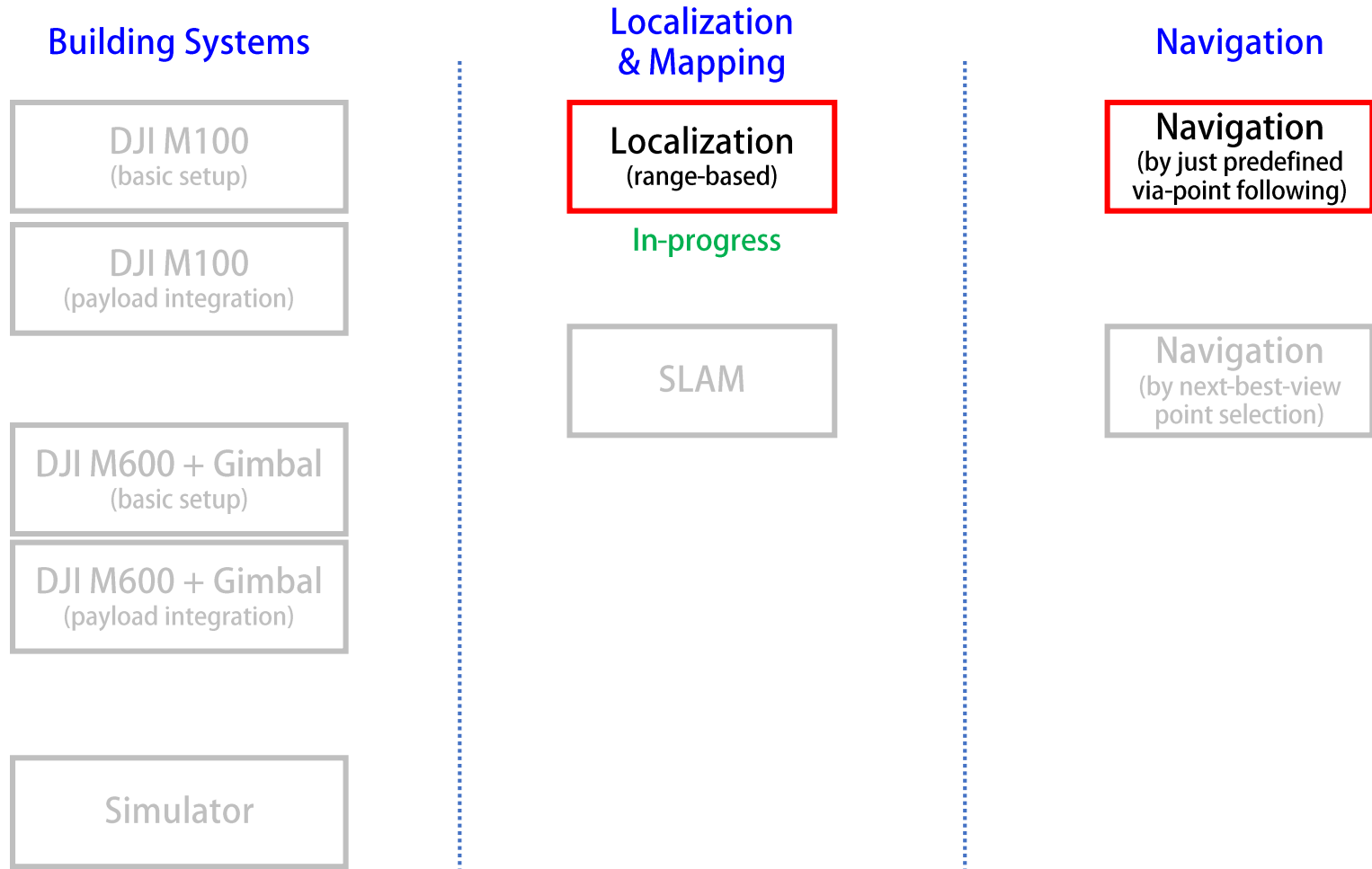❑ Task 1: Localization

❑ Task 2: SLAM

❑ Task 3: Navigation

Task 0: Building Systems

❑ Building Complete Systems

Building Systems

Done! | DJI M100
(basic setup)

Done! | DJI M100
(payload integration)

DJI M600 + Gimbal
(basic setup)

DJI M600 + Gimbal
(payload integration)

Simulator

Localization & Mapping

Localization
(range-based)

SLAM

Navigation

Navigation
(by just predefined
via-point following)

Navigation
(by next-best-view
point selection)

Task 1: Localization

❑ Following Predefined Via-Points

Building Systems

Localization
& Mapping

Navigation

| DJI M100
(basic setup) |
|---|

| DJI M100
(payload integration) |
|---|

| DJI M600 + Gimbal
(basic setup) |
|---|

| DJI M600 + Gimbal
(payload integration) |
|---|

Simulator

| Localization
(range-based) |
|---|

In-progress

SLAM

| **Navigation**
(by just predefined
via-point following) |
|---|

| Navigation
(by next-best-view
point selection) |
|---|

Task 2: SLAM

❑ Building a Map

Building Systems

DJI M100
(basic setup)

DJI M100
(payload integration)

DJI M600 + Gimbal
(basic setup)

DJI M600 + Gimbal
(payload integration)

Simulator

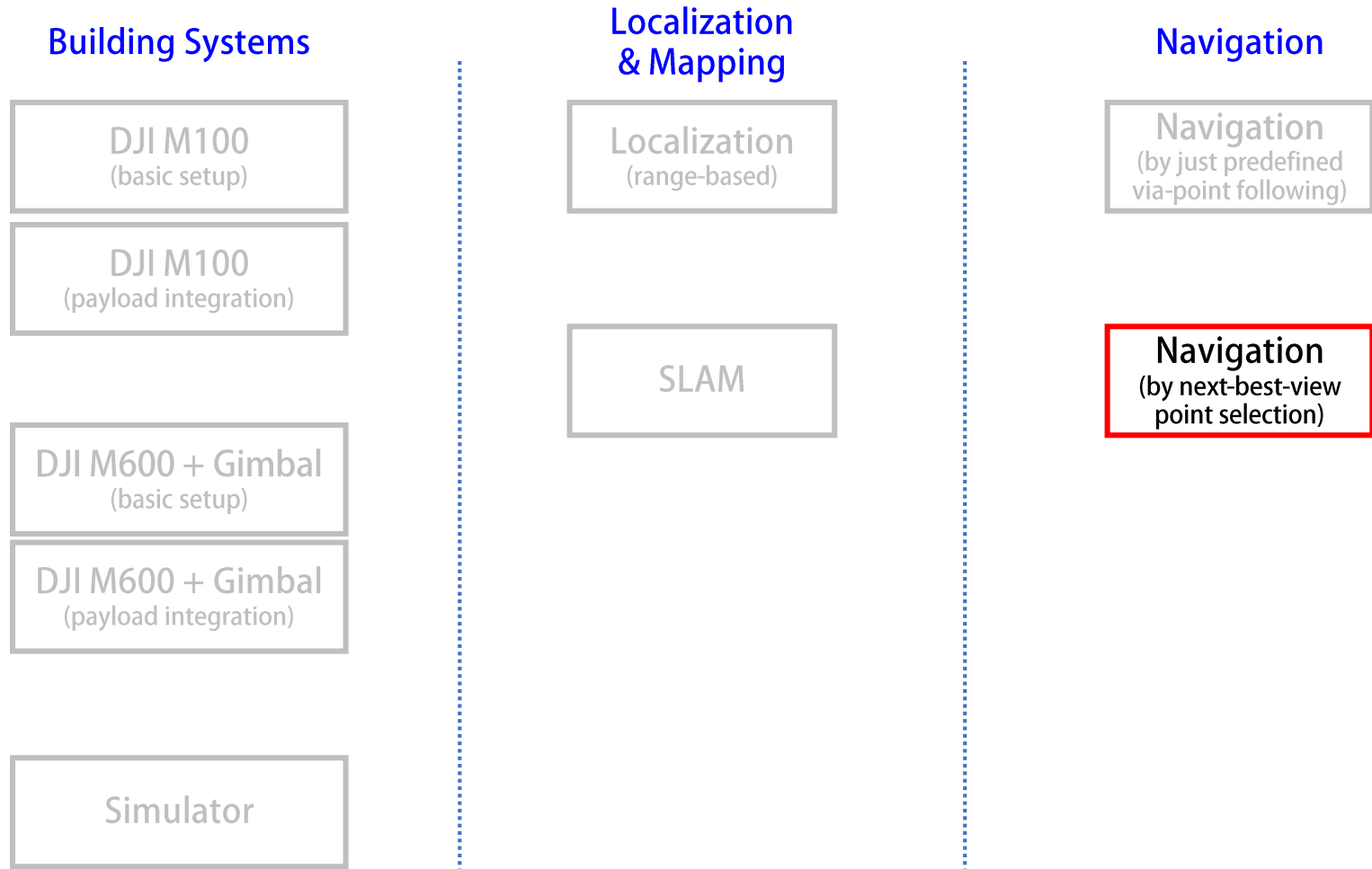**Localization
& Mapping**

Localization
(range-based)

SLAM

Navigation

Navigation
(by just predefined
via-point following)

Navigation
(by next-best-view
point selection)

Task 3: Navigation

❑ Building a Map by Next-Best-View Point Selection

Building Systems

Localization & Mapping

Navigation

DJI M100
(basic setup)

DJI M100
(payload integration)

DJI M600 + Gimbal
(basic setup)

DJI M600 + Gimbal
(payload integration)

Simulator

Localization
(range-based)

SLAM

Navigation
(by just predefined
via-point following)

Navigation
(by next-best-view
point selection)

Meeting Results: What to do

❑ Common
  ▪ Basic setup for 'DJI M600 + Gimbal' (primarily by Zahra & Kunwoo)

❑ Zahra
  ▪ Understanding Kunwoo's EKF-based UWB localization code
    (including EKF)

❑ Kunwoo
  ▪ Sending thesis and experiment plan to prof. Sohn
  ▪ Writing a paper for ISPRS Geospatial Week 2019

❑ Jungwon
  ▪ Writing a paper for IROS 2019