# Problem Formulation

Estimating the leader’s behaviour: how to model it stochastically?

Consider active damping for payload oscillations.

Plan optimal trajectory for leader (or payload); what will the follower do?

Consider potential field for collision avoidance.

Consider optimal trajectory planning for n-robot swarm and assumptions about follower behaviors.

Followers: estimate the leader’s position and track that, not necessarily the instantaneous cable angle.

# Theory

Review rotation matrices, kinematics and dynamics equations.

Study twists and wrenches.

~~Do the Kelly tutorial on direct collocation methods.~~

Study dynamic movement primitives.

Review SO(3), SE(3).

Study Udwadia-Kalaba method for dynamics formulation.

# Project Management

Investigate Eric’s suggested software package and recommended textbook references.

**~~Inception report~~**~~: check requirements on webpage.~~

Do citations analysis on first round of papers; workflow: **find, read, notes + read next, citations analysis.**

~~Finish notes for existing papers; digitize notes and next steps; check out optimal controllers; make new reading list.~~

~~Look for optimal control and CPT in literature survey.~~

Seek papers on optimal control for CPT in IROS 2018.

~~Annotated bibliography format: IEEE reference. Task. Grasped/cable-suspended? Centralized/distributed/decentralized? Control strategy (optimization, cost function structure?).~~

Create progress bulletin site in markdown.

~~Digitize minutes and outstanding tasks.~~

~~Digitize surveyed surveys notes.~~

Read and make notes for Dai et al. (2014) – in high-priority folder.