EEET2610 – Engineering Design 3

Self-reflection and Peer Evaluation

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# Abstract

The self-reflection report on the drone project offers a condensed overview of personal insights, experiences, and lessons learned throughout the project's lifecycle. Emphasizing the author's subjective perspective, this abstract encapsulates moments of challenge, growth, and achievements encountered during the drone project. By intertwining technical knowledge with personal reflections, the report delves into the evolution of skills, problem-solving approaches, and the emotional aspects of navigating a complex and innovative endeavor. The abstract strives to present a succinct narrative, prompting readers to explore the self-reflection report for a more in-depth understanding of the author's unique journey within the realm of drone technology.

# Introduction

In recent years, the integration of drone technology has emerged as a pivotal force reshaping conventional paradigms across diverse industries. This self-reflection report embarks on a narrative journey, exploring my engagement in a significant drone project that has not only encapsulated technological advancements but has also played a transformative role in my personal and professional development. Providing a contextual backdrop, the introduction delves into the broader landscape of drone applications, citing reputable sources to elucidate the growing importance of drones in fields such as agriculture, environmental monitoring, and disaster response. The thesis statement crystallizes the central theme of the report, emphasizing the exploration of personal growth and lessons gleaned through hands-on involvement in the dynamic realm of drone technology. Furthermore, the introduction outlines the scope of the work, delineating the specific facets of the project that will be examined, while offering a structural preview of subsequent sections. This introduction aspires to be concise, engaging, and informative, paving the way for an insightful exploration of the intersection between technological innovation and personal introspection within the context of the drone project.

# Self-Reflection

## Summary of the project

The Project Proposal encompasses the global progress in Unmanned Aerial Vehicles (UAVs) and outlines the key components of the Inverted Pendulum experiment, which includes two specific experiments referred to as Work Package 1 (WP1) and Work Package 2 (WP2). It commences by examining the evolution of unmanned flights, their applications, and the positive contributions they have made globally. However, challenges persist in the UAV domain, particularly regarding stability and control in diverse conditions. In response, the project aims to offer foundational and theoretical insights into the design of an inverted pendulum powered by propellers, proposing potential solutions and detailing experimental plans. The essence of the project is concentrated in the specifics of WP1 and WP2. The proposal provides a team management timeline and an inventory list. The conclusion discusses anticipated benefits, collaborations, potential risks, and introduces the project team members.

## Summary of the teamwork

In this course, the seamless integration of electrical, hardware, and software skills is pivotal for project success. Recognizing this, our team engaged in comprehensive discussions to allocate and coordinate each member's tasks efficiently, keeping in mind the importance of time-saving measures. While our collaboration may not have reached the pinnacle of professionalism, the team fostered an environment for exchanging ideas and actively listening to one another's contributions and suggestions. Upholding the principles of respecting individual perspectives ensured that all team member's opinions were acknowledged. Despite occasional coordination challenges, the collaborative experience provided valuable lessons for each team member, promoting self-reflection and a deeper understanding of personal strengths and weaknesses. These insights will undoubtedly contribute to continuous learning and improvement for future endeavors.

## Self-reflection of contribution to the project

In the course of our project, my primary focus revolved around implementing real-time GPS tracking, incorporating both location and date-time data. My specific task involved deploying this information onto Bing Maps within our web server framework. Taking on this responsibility, I embraced the challenge with a high level of dedication and enthusiasm, recognizing its pivotal role in the project's overall success. Throughout the process, I encountered a blend of obstacles and achievements, with technical complexities offering valuable opportunities for problem-solving and skill enhancement. Collaboration with the team played a crucial role, as I maintained transparent communication on the task's progress and welcomed input from fellow members, fostering a collaborative and integrated approach. This experience not only enriched my technical skill set but also imparted essential lessons in effective project coordination and communication. My involvement in implementing GPS tracking and real-time data deployment has been a fulfilling journey, and the knowledge gained will undoubtedly shape my future approach to similar projects.

## Feedback

Reflecting on our project, the collaborative efforts of the team have resulted in a successful integration of real-time GPS tracking and data deployment onto Bing Maps. The dedication and technical proficiency demonstrated by each team member have been commendable. However, envisioning future improvements, I believe extending the drone's fly time, enhancing its stability, and implementing automation through PID (Proportional-Integral-Derivative) control are crucial considerations. Prolonging the drone's flight duration would undoubtedly broaden its applicability and efficiency in various scenarios. Ensuring greater stability is essential for precise and reliable data collection, contributing to the overall effectiveness of the project. Implementing an automated PID control system would further refine the drone's movements, optimizing its performance and response to changing conditions. These enhancements would not only elevate the project's capabilities but also open doors to broader applications in fields such as surveillance, mapping, and environmental monitoring. Overall, our project's success provides a solid foundation for these future improvements, fostering innovation and continuous growth.

# Peer Evaluation

## Nguyen Le Quoc An

Assessing the Project Manager's (PM) performance with a score of 9/10, it's evident that their commitment and leadership significantly influenced the project's success. The PM consistently demonstrated a strong grasp of project details, leading discussions with valuable insights. Their respectful demeanor and commitment to team principles earned them high marks, contributing to a positive team dynamic. Additionally, the PM's involvement in PID tuning and testing showcased a well-rounded skill set, further enhancing their overall contribution to the project.

## Nguyen Le Cong Hieu

Assessing the only electronic teammate's performance, I would assign a score of 9/10. His work on establishing communication between ESP32s with ESPNow demonstrated solid technical proficiency, contributing significantly to the project's success. Additionally, their role in soldering components onto the circuit board and ensuring proper wire connections showcased meticulous attention to detail. While Hieu actively participated in the project, there's room for improvement in terms of proactive engagement and collaboration with other team members, aligning more closely with the team contract. Overall, their technical contributions were noteworthy, contributing positively to the electronic aspects of the project.

## Trinh Tran Thanh Truc

In evaluating the Robotics teammate, I would assign a score of 9/10. Her instrumental role in drone design and electric assembly showcased exceptional skills in shaping the project's hardware components. Furthermore, her collaboration with Hieu in PCB soldering demonstrated effective teamwork and shared responsibilities. Engaging in collaborative PID tuning highlighted her commitment to refining the drone's performance alongside the team. Additionally, her role as a pilot showcased a hands-on understanding of the drone's operational aspects. Overall, her diverse contributions significantly enriched the project, earning her a commendable score.

## Luu Nguyen Bao Tran

Assessing Tran's performance, I would assign a score of 8/10. Her collaboration in creating the wiring diagram with Hieu and Truc showcased effective teamwork and coordination. Additionally, her role in managing the report with Tuan demonstrated organizational skills and a commitment to project documentation. In the crucial phase of PID tuning and testing, her active participation with the rest of the team contributed to refining the drone's performance. While her contributions were valuable, there's room for improvement in terms of taking on additional responsibilities and proactive engagement. Strengthening communication and ensuring consistent participation align with the team contract, fostering an even more cohesive team dynamic. Overall, her efforts significantly contributed to the project's success, warranting acknowledgment and a commendable score.

## Do Bao Long

Evaluating the Long’s performance, I would assign a score of 9/10. His pivotal role in designing and constructing the remote controller showcased exceptional skills in hardware development. Moreover, his responsibility for arranging and wiring all components demonstrated meticulous attention to detail, ensuring the controller's functionality. In the software domain, Long's contributions were equally impressive. Programming the SSD1306 OLED display, initializing the Motion Processing Unit 6050 sensor, and implementing the Kalman filter algorithm underscored their proficiency in software development. Collaborating seamlessly with three other teammates for PID tuning and testing reflected strong teamwork and coordination. While their performance was exemplary, a slight improvement in communication and documentation aspects could enhance overall effectiveness, aligning more closely with the team contract. Overall, the Robotics teammate's contribution significantly bolstered the project's success.

## Tran Quang Tuan

In evaluating the Robotics teammate, I would assign a score of 9/10. His collaborative efforts in managing the report with Tran demonstrated effective teamwork and a commitment to project documentation. Engaging in PID tuning and testing with the rest of the team showcased his dedication to refining the drone's performance. Furthermore, his collaborative coding of the MPU with Long highlighted strong teamwork in the software domain. A noteworthy aspect of his contribution is his focus on ensuring the drone's safety, indicating a responsible and proactive approach. The teammate consistently upheld the team contract, demonstrating respect and commitment to the project's success. Overall, his multifaceted contributions significantly enriched the project, warranting a commendable score.