Spring 2023 ECE 445 Team Contract

Instructions: The content of this document should be specific to your goals and needs. Ideas for the content of each section are provided as suggestions.

Project No. and Name	
Member Name, netID	Joe Luo (luo42)
Member Name, netID	Zekai Zhang (zekaiz2)
Member Name, netID	James Tian (zeyut2)

ECE 445 is a project-based course. The course includes both team and individual grades. Project teammates generally all get the same grade for team assignments based on the expectation that all team members do their fair share of the work involved. The purpose of this contract is to lay out the tasks needed for the successful completion of the project and distribute them in a fair and efficient way to the team members. It will also discuss how the teammates will work together during the project and address any issues that come up. A contract that promotes good teamwork that leads to a successful project should:

- Acknowledge that each team member has commitments and responsibilities outside of ECE 445
- Encourage open communication about challenges that team members are facing, both in and out of ECE 445
- Give team members the benefit of the doubt and the opportunity to explain themselves when something goes wrong and resist jumping to judgment

Project Description: The project proposes a duo-terminal system that enables long-range motion communication through a wireless RF communication channel. The system is designed to read motion data from a discrete accelerometer and gyroscope measurements with an appropriate sampling rate, encode the information, and transmit it to the other terminal, which deciphers the data and reproduces the motion in real-time with 3D software simulation or mechanical integration like a motor. The project builds upon a previous project that clones movement data generated from MEMS sensor measurements to 3D animation. The system will consist of two PCBs for each terminal, with IMUs (motion sensors) preferably connected to the rest of the system via STEMMA QT or long wires for flexibility of arrangement. The project's goal is to provide a new way of communication that goes beyond texts, videos, and sounds, enabling users to transfer and reproduce motion across a long distance for a variety of applications, including classroom settings, workplace security, drone navigation, and smart homes.

Project Goals: *If the team is successful in its purpose, what hardware and software achievements will attest to this?*

The main goal of this project is to establish a successful data transfer amount transmitter, receiver and microcontroller. If completed, the project will be able to show a demo of a virtual cylinder simulating a real hand generating motion in 3D space with relatively low latency. A hardware part is also planned, but as an extra part to the project. If we were able to finish this project ahead of time, we will attempt to implement a mechanical robot arm with two joints to simulate the motions.

Expectations (ground rules) for each member: *Try to list six or more minimum expectations. Consider aspects such as preparation, participation, feedback, responsiveness, etc. Try to explicitly list anything that could potentially turn into a problem. Find ways to encourage everyone to communicate (this may also fall under "tasks").*

1. Assigned tasks should be done on-time or no later than at most two days past the due date.
2. Communications should be prompt, constructive, and effective, especially regarding urgent issues, for which no response should be later than 24 hours.
3. Technical skills indicated by a good understanding of radio communication methods, MEMS device functionalities, and microcontroller logics are expected from every member whenever needed.
4. Distribution of work and workload should be fair and reasonable. Each member is expected to work on the same technical and quantitative standard.
5. Disputes regarding matters like direction of the project, selection of instruments, and methods of implementation between members should be democratically resolved by voting.
6. Adequate documentation should be kept by each member to track their progress throughout the semester and should be ready to present to all at all times when requested.

Roles: *Do you see this team performing well because everyone works together and contributes equally? Are there certain aspects of the project that some teammates excel at? Can tasks be spread among individuals to optimize progress toward the final product?*

General roles for this project is to have James working on PCB design, Joe working on RF receiver and Zekai working on RF transmitter. Joe has the most experience working with RF, so he is leading the RF subsystem development. With that said, all the tasks are made open among the team members so each of us could jump into another role to ensure good progress.

Project Meeting Time(s): *The team will meet at the scheduled team meeting with TA each week. Can you also present an ideal time for team meetings in the lab (your team may need to sign up for lab bench access)? Is your team interested in meeting to work on other aspects of the course together such as project research?*

The scheduled meet time is every Tuesday afternoon and evening to resolve issues at the lab. Most of the testing process should be able to be completed individually at home. We have gone through our schedule so more meetings can be arranged at an appropriate time if necessary.

Agenda: *Who will set the agenda? Beyond the weekly meetings with the TA, what will the team do to ensure that it stays on track during the semester? When a decision needs to be made, will it be approved by consensus or majority vote? Will a team member be appointed to keep records?*

Since we have a concrete schedule mapped out and each team member has been assigned with clear roles, the agenda of the meetings will be determined by all the issues team members encounter each week. As stated in the project meeting section, we will have our own meeting every Tuesday beyond the regular TA session to make sure that the team is on track. Decisions will be made based on consensus and specific design records will be kept in each person's lab notebook based on the role.

Process and penalties for dealing with team issues: What happens when ground rules are broken? Who intervenes? What happens if the situation escalates? Always remember not to jump to judgment. Give group members the benefit of the doubt and the opportunity to explain themselves when something first goes wrong. TAs and instructors are available to help resolve issues.

Though it will be highly unlikely for any team member to break rules due to our previous partnerships, if severe or repeating violation of rules occurs it will be notified to the TA during weekly meetings. In addition, peer review points will be deducted for those who won't cooperate and refuse to apologize after rule violation.

End-of-term agreement on using final peer assessment for grade adjustment: Do you believe that this contract should hold your team accountable to its contents or that it may hold little value? There will be two formal peer assessments this semester. The first is used only to provide honest, constructive feedback to each team member. The second peer assessment affects a teammate's grade. Without accountability, many promises go by the wayside.

Our team members are highly committed to produce the best product possible at the end of the term and we all take our grades very seriously. Penalties of grade deductions will be issued for repeated violations of rules to help hold our team accountable. Serious issues will be informed to the TA and be taken seriously. We do not wish for any promises to be broken, but there will be consequences depending on the severity of the matter.

Signatures: Iterate on this document until everyone is comfortable with its contents and signs (it is okay to type your printed name as your digital signature).

I affirm that I participated in generating this team charter and that I will abide by its contents to the best of my ability. Furthermore, I understand that failure to meet the expectations expressed here can lead to the stated consequences.

netID: _____zekaiz2_____ (digital) Signature: ____Zekai Zhang____ Date: 2/24/2023

netID: _____zeyut2_____ (digital) Signature: ____James Tian_____ Date: 2/24/2023

netID: _____luo42_____(digital) Signature: ____Joe Luo_____ Date: 2/24/2023