Part A - at the beginning of design document

Team:

Simulated design of Quantum Networks

Team Members:

Benjamin Amick - Cyber Security major
Ohik Kwon - Electrical Engineering major, Physics minor
Steven Tompary - Cyber Security major
Derrick Wright - Software Engineering major

Required Skill Sets for your Project:

Understanding of Quantum mechanics and matrix operations are required. Knowledge of information systems (security, networks etc.) are encouraged to be prepared. Coding skills are also required to build our simulated quantum networks. Self-motivating attitude, communication skills, writing and reading skills are required for this project.

Skill Sets Covered by the Team:

Understanding of quantum computation and qubits - Ohik and Derrik
Knowledge of information systems and network architecture - Ben, Steven
Coding and software development skills - Derrik
Self motivation and communication skills - Everyone

Project Management Style Adopted by the Team:

We believe that a hybrid management which consists of Agile and waterfall is the best framework for our group to use. Since our project is research intensive, we're planning to keep updating the performance of our quantum network for the cluster computing based on the very basic and rudimentary network. To meet our clients' needs as possible. For example, we're planning to make 1 quantum bit centralized router that determines every behavior of the network. After that, we will evolve our network by adding functions such as quantum key distribution, error correction, and decentralized router.

Initial Project Management Roles:

Benjamin Amick - Network security engineer
Ohik Kwon- System component designer
Steven Tompary- Network engineer
Derrick Wright - System integration engineer

Part B - at the appendix

Team Name

Simulated design of Quantum Networks

Team Members

1) Benjamin Amick
2) Ohik Kwon
3) Steven Tompary
4) Derrick Wright

Team Procedures

1. **Day, time, and location (face-to-face or virtual) for regular team meetings:**
   Every Thursday at 4 p.m. to 5 p.m. at the Student Innovation center with an advisor.
   Every Monday 6 p.m. to 7 p.m. - team member only meeting
   Every Friday 7 p.m. to 8 p.m. - team member only meeting
2. **Preferred method of communication updates, reminders, issues, and scheduling (e.g., e-mail, phone, app, face-to-face):**
   Thursday meeting held in-person. Other two team meetings are on a team discord meeting.
   Phone call communication is for emergencies only.
   Other non-emergency communications are on Email.
3. **Decision-making policy (e.g., consensus, majority vote):**
   Consensus is our base rule. If there were controversies, than majority vote will be used
4. **Procedures for record keeping (i.e., who will keep meeting minutes, how will minutes be shared/archived):**
   Ben takes charge of recording meeting minutes and uploading our google drive.
   Other team members also take notes if they think it is needed.

Participation Expectations

1. **Expected individual attendance, punctuality, and participation at all team meetings:**
   We will expect all team members to attend all meetings or at least make the whole team aware if they will be missing or late.
2. **Expected level of responsibility for fulfilling team assignments, timelines, and deadlines:**
   All team members are expected to prepare a 3 minute presentation which will be shared each Thursday to Dr. Pudyal. These presentations are expected to be short summaries of what we have each learned over the previous week. Team assignments are expected to be completed early so that everyone has a chance to review them before they are submitted.
3. **Expected level of communication with other team members:**
   Team members will communicate with everyone using the discord or email to explain any absences or issues with completing their work.
4. **Expected level of commitment to team decisions and tasks:**
   Every team member is expected to provide input on each team decision and tasks. If a certain member is feeling as though the team should go a different direction or there is some issue with tasks they are to bring it up with the group so it can be discussed at a meeting.

Leadership

1. **Leadership roles for each team member (e.g., team organization, client interaction, individual component design, testing, etc.):**
   Benjamin Amick - Communication with Client, recording meeting minutes. Design of usable Quantum Key Distribution for our simulated quantum network.

Ohik Kwon- Writing weekly reports. Making quantum gates for our quantum network simulations.

Derrik Wright - Compiling weekly reports and minutes into the team website, researching Qiskit framework and understanding base level quantum computational gates.

Steven Tompary - Compiling weekly reports and minutes into the team website, Creating a quantum network simulation using Qiskit.

2. **Strategies for supporting and guiding the work of all team members:**
   Since our senior design consists of two sections which are building networks and building systems, if someone in one field struggled then communicate within each section and help each other to handle problems. When one section has tough issues which can not be solved easily, then share their situation in meetings and solve them together.
3. **Strategies for recognizing the contributions of all team members:**
   Share our current work such as what is currently working(building) on and what have been tried for last week and results during a weekly meeting with advisor and team meetings.
   Use a time tracker excel sheet for updating how many times we put on our senior project and updating works we have completed.

Collaboration and Inclusion

1. **Describe the skills, expertise, and unique perspectives each team member brings to the team.**
   Ben: Network engineering experience, understanding of currently used key distribution techniques
   Ohik: Knowledge of Quantum Computation and
   Steven: Network engineering experience, has done work with creating and simulating up new networks as well as key distribution algorithms
   Derrik: Software development skills, has knowledge of quantum information systems
2. **Strategies for encouraging and support contributions and ideas from all team members:**
   Self motivation is important for this project since simulating quantum networks requires not just quantum mechanics and science but also information communication systems. If someone were losing their interest in this project due to too much reading materials and study, then other team members can assist, help, and teach each other to keep us at the same level of understanding.
3. **Procedures for identifying and resolving collaboration or inclusion issues (e.g., how will a team member inform the team that the team environment is obstructing their opportunity or ability to contribute?)**
   If someone in our team has an issue they are to bring it up at the next team meeting and the group will work together to find a solution to the problem. The group will make an effort so that each team member feels valued and is able to contribute to the project.

Goal-Setting, Planning, and Execution

1. **Team goals for this semester:**
   Our goal for this semester is researching and understanding quantum computing to the point where we are able to design our own simulation of a quantum network.
2. **Strategies for planning and assigning individual and team work:**
   Our plans include reaching out to professionals who are well versed in Quantum networking as well as read textbooks and papers which they recommend.
3. **Strategies for keeping on task:**
   To keep the group on track, we are going to have weekly presentations to our advisor on what we accomplished the past week and include a summary of what we learned.

Consequences for Not Adhering to Team Contract

1. **How will you handle infractions of any obligation of this team contract?**

Any team member not adhering to this contract will be asked to provide context as to why they were not performing their duties. On top of this, they will be expected to pick up extra work the next week so that the team does not fall behind.

2. **What will your team do if the infractions continue?**

If issues continue, then we will take matters to the professor and seek further guidance.

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a) *I participated in formulating the standards, roles, and procedures as stated in this contract.*
b) *I understand that I am obligated to abide by these terms and conditions.*
c) *I understand that if I do not abide by these terms and conditions, I will suffer the consequences as stated in this contract.*

1) Benjamin Amick DATE 2/19/2023
2) Ohik Kwon DATE 2/19/2023
3) Steven Tompary DATE 2/19/2023
4) Derrick Wright DATE 2/19/2023