**A Dissertation Report on**

**Online Multiplayer Chess Game**

**Name of student: Jagadish Parajuli**

**UN ID: 21422012**

**BSc Computing**

**Supervisor: Nischal Khadka**

**NAMI College**

**University of Northampton**

**Jorpati, Kathmandu, Nepal**

**Online Multiplayer Chess Game**

**By Jagadish Parajuli**

**UN ID: 21422012**

**Submitted in fulfilment of the requirements for the degree of**

**BSC COMPUTING (SOFTWARE ENGINEERING)**

**The University of Northampton**

**2023**

1. **Introduction**
   1. **Dissertation Background**

Chess is a strategic and brain game that has attracted players for many years. There are many different tactical possibilities available while playing this historical battle on a square board with individual pieces. Due to the influence of technology and the internet, chess has not only survived but flourished in the modern era.

Chess has experienced an exceptional comeback in recent years due to advances in technology and increased online access. Chess has been transformed by websites like chess.com and lichess.org, which have opened it up to a worldwide fan base. Players of all skill levels can participate in thrilling matches on these platforms, analyze their games using sophisticated software, and interact with other chess players from across the world. Chess has been given new life by the digital revolution, which has changed it from a static, regional pastime into a vibrant, global activity.

My dissertation thesis, at the meeting place of software development and the gaming industry, takes center stage within this quickly expanding online multiplayer gaming ecosystem. The main goal of this project is to create a multiplayer online gaming platform that can accommodate the wide range of modern gamers' preferences. This system has several features designed to improve the gaming experience, including a user-friendly portfolio for tracking progress, simple multiplayer functionality with integrated chat, an effective rating system with leaderboards for competition, several gaming modes to suit different tastes, an advanced analysis tool for strategic improvement, and a variety of entertaining puzzles for entertainment and challenge. In a time when playing video games is no longer just for fun, my project aims to make an important addition to the field of online multiplayer gaming where strategy, social interaction, competition, and entertainment come together to rethink the future of interactive gaming.

We will go into the specifics of this software engineering dissertation as we delve into the field of online multiplayer gaming, looking at its design, development, and creative solutions for the gaming sector. We will explore the inner workings of this project in the upcoming chapters, breaking down its architecture, functionality, and practical applications. We'll see how technology has changed the gaming scene by making connections and challenges possible across borders. With this dissertation, i hope to promote understanding of the rapidly developing field of gaming on the internet and the important impact that software engineering will have on its future development.

* 1. **Aims and Objectives**

The project's goal is to develop an effective online multiplayer gaming platform that improves gameplay and creates a sense of community. The key aims include:

* Making the whole gaming experience better.
* Promoting online gaming interaction with one another.
* Utilizing analysis techniques to enable strategic improvement.
* Offering a range of game options.
* Maintaining fair competition with a strong rating system and leaderboards.

The project will carry out the following technical activities to achieve the aims listed above.

* Create a responsive and visually impressive user interface (UI) for gameplay using HTML5, CSS3, and JavaScript (JS).
* Use MySQL as the database system and Laravel as the framework for effective backend administration to ensure smooth user interactions and data management.
* Use WebSocket technology to provide real-time online matchmaking and chat features that allow for quick connections and communication between participants.
* Create and build an adaptive rating system that gives newly registered players initial ratings and uses statistical methods to change ratings in accordance with game results.
* Pairing players with similar skill levels, a rating system which provides fair matchmaking for proper challenging opponents in online games.
* Give players access to a variety of game modes and categories, including time-based games like blitz, bullet, and traditional variations within the online multiplayer framework, to improve the gaming system.
* Make interactive leaderboards that encourage players to improve their game and compete for the top places.
* Create a tool that allows players to carefully analyze their matches by integrating the Stockfish API.
  1. **Dissertation Methodology**

Agile is the software development methodology selected for this dissertation. It is an approach that emphasizes flexibility and customer participation throughout the development process and is highly adaptive and iterative. To provide continuous feedback, improvements to changing requirements, and active stakeholder involvement, it divides projects into tiny, manageable units known as sprints. Agile is well known for its benefits, which include the capacity to adapt quickly to changing priorities, reduce project risks through incremental project delivery, improve client satisfaction, and enable quick replies to feedback. It is essential to recognize the disadvantages as well, such as the decreasing importance of complete paperwork and its limited applicability for projects with predictable requirements. In-depth study of the concepts, benefits, and drawbacks of the Agile methodology's applicability as well as its impact on the creation of an online multiplayer gaming system will be provided in this dissertation.

Some advantages of agile methodology are listed below:

* Agile is flexible and adaptable, making it a good choice for projects that are dynamic and constantly changing.
* In Agile, incremental releases help detect problems early and address them quickly, lowering the chance of project failure.
* Constant engagement with customers encourages a collaborative environment, ensuring that the finished result closely matches the client's expectations.
* It starts delivering functional components early in the project, giving stakeholders a sense of concrete progress and early access to important features.

Some disadvantages of agile methodology are listed below:

* It can be difficult to keep detailed records of design decisions and requirements since agile promotes functioning software above detailed documentation.
* It is most useful for projects with rapidly changing requirements, for projects with fixed requirements, it may add unnecessary complexity.
* It can be resource intensive as it requires a large amount of time and effort investment from team members, stakeholders, and customers.

1. **Requirement Engineering**
2. **System Analysis and Design**
3. **System Interface Design**
4. **System Build and Technical Notes**
5. **Test Strategy**
6. **Conclusion**
7. **References**
8. **Appendix 1 – Project Timescales**
9. **Appendix 2 – Project Diary/Log**