PROJECT/INDEP STUDY TITLE LINE 1
PROJECT/INDEP TITLE LINE 2 (OPTIONAL)

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Abstract

In a multihop ad hoc network, the interference among nodes is reduced to maximize the throughput by using a smallest transmission range that still preserve the network connectivity. However, most existing works on transmission range control focus on the connectivity but lack of results on the throughput performance. This paper analyzes the per-node saturated throughput of an IEEE 802.11b multihop ad hoc network with a uniform transmission range. Compared to simulation, our model can accurately predict the per-node throughput. The results show that the maximum achievable per-node throughput can be as low as 11% of the channel capacity in a normal set of α operating parameters independent of node density. However, if the network connectivity is considered, the obtainable throughput will reduce by as many as 43% of the maximum throughput. YOOO

Keywords: Multihop ad hoc networks / Topology control / Single-Hop Throughput

ACKNOWLEDGMENTS

Acknowledge your advisors and thanks your friends here..

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LIST OF SYMBOLS

SYMBOL		UNIT
α	Test variable	m^2
λ	Interarival rate	jobs/second
μ	Service rate	jobs/second

CHAPTER 1 INTRODUCTION

1.1 Background

This is the background of the project.

1.2 Motivations

This is our motivations.

- What are the problems you are addressing?

- Why they are important?

- What are the limitations of existing approaches?

You may combine this section with the background section.

1.3 Problem Statements

This is our problem statement.

1.4 Objectives

This is our objectives.

1.5 Scope of Work

This is our scope.

1.6 Project Schedule

This is our schedule

CHAPTER 2 BACKGROUND THEORY AND RELATED WORK

2.1   Games as an Education Medium

2.1.1   Games Popularity Around the World

`https://financesonline.com/number-of-gamers-worldwide/` comprises of statistics, demographics, and predictions related to games and gamers both worldwide and by region. [Nestor Gilbert]

According to NewZoo Research (2020), there were 2.69 billion gamers in the world by the end of 2020. From the statistics, it is to be expected that the number of gamers will continue to rise, expecting to reach 2.95 billion gamers worldwide in 2022.
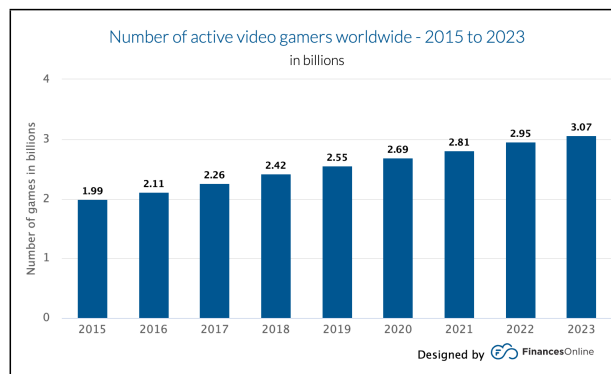
Figure 2.1 Numbers of active gamers worldwide

Looking further into the age group of gamers. Limelight's research(2020) suggests that every gamers ranging from age 18 - 64 years old spend at least 4.7 hours per week playing games, with the highest hours of 7.48 in 18 - 25 age group.
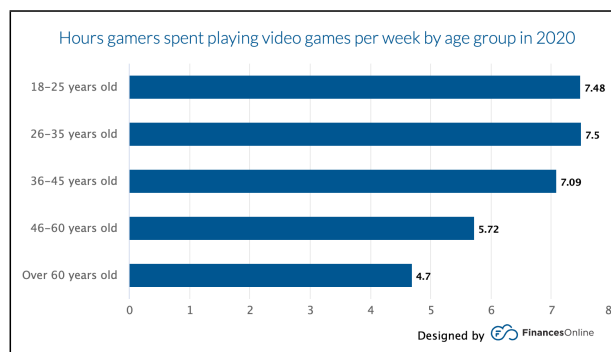
Figure 2.2 Average gaming hours per week by age group

Game is currently one of the largest markets. Its revenues for 2020 reached over 159.3 billion US Dollars with almost half of market earnings generated by the Asia Pacific region. Evidently, game is a useful tool that can reach out to a broad range of people, which is why the demand for educational games are increasing especially during the pandemic where classes are taught online.

2.1.2   Application of Educational Games and its effectiveness

`https://research.com/education/interactive-learning-statistics#5` provides statistics, demographics, and predictions related to educational games and active learning methods. [Imed Bouchrika] Interactive learning is a learning method that supports the communications and interactions between educators and students. One of the effective ways to achieve active learning is through games. Juraschka (2019) showed that 74% of teachers used game-based learning to enhance their lessons. This also applies in other settings other than the classroom as well, such as workplace and companies, which evidently increased the compound annual growth rate by half according to Ibáñez research (2018)

These research paper suggests the effects that educational games have on students.
`https://www.frontiersin.org/articles/10.3389/feduc.2021.623793/full` focused on educational games and learning effectiveness on college students [Siu Yin Cheung, Kai Yin Ng]
`https://www.sciencedirect.com/science/article/pii/S1875389212015933` analyzes the relationship between educational games and mathematics and logic. [Jing Li, Sujuan Ma, Linqing Ma]
`https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-017-0062-1` explores the effects of games and simulations on higher educatio.n [Dimitrios Vlachopoulos, Agoritsa Makri]
`https://www.researchgate.net/publication/233279860_Motivating_Children_to_Learn_Effectively_Exploring_the_Value_of_Intrinsic_Integration_in_Educational_Games` suggests that motivations are the important aspect of using games as a educational tool. [Jacob Habgood, Shaaron Ainsworth]

Evidently, games are one of the effective methods to conduct interactive class and active learning for students. It can provide motivation and stimuli for students, and can effectively help them understand the concept they're trying to learn more deeply and entertainingly.

2.1.3   Educational Game Specifications

`https://www.researchgate.net/publication/267034149_Educational_Games_for_Teaching_Computer_Programming` page 3, in the topic educational games requirement specification suggests what aspects should be included in an effective educational game.
It is suggested that it should include two main aspects which are
1. Cognitive axis: Information intended to be received by the students should begin from the first category in the Bloom's taxonomy.
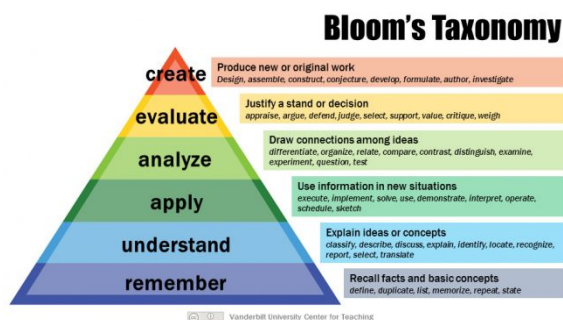
2.1.3.0.1 Bloom's Taxonomy This is the structure of Bloom's Taxonomy, a taxonomy for teaching, learning, and assessment. It'll help us plan and design effective questions and puzzle for our game. Besides, we can ensure that our game lessons align with the objectives of teaching the fundamental of AI.

2. Emotional axis: Enable students to handle given situations through emotions, and using it to motivate students to solve and learn faster. So, they can experience the accomplishments when they get to the end of the story.

2.2 Importance of Artificial Intelligence

2.2.1 Artificial Intelligence from Global Perspective

https://mitsloan.mit.edu/ideas-made-to-matter/new-report-details-growing-global-interest-art:
a report from 2018, shows that interest in AI from a global level has been increasing rapidly in the past few decades.

Presently in 2021, the interest is still growing. Even more so when there are so many new technologies emerging that will require the power of AI to solve. Research focusing on AI has drastically increased. AI is applied to many aspect of our lives and work such as engineering, society, medications, and so on. So, it's crucial that everyone, interested in developing AI or not, knows the fundamental of AI as it will have a critical role in our daily lives in the near future.

2.2.2 Artificial Intelligence in Thailand

https://thaiembdc.org/2021/04/28/ai-and-robotics-growing-rapidly-in-thailand/
suggests the trend of AI in Thailand and shows related statistics.

Similar to the global level, AI in Thailand is also growing at a rapid rate. We have the foundation ready for AI and automation industry. So, it's predicted that AI trend will grow in the future to support the country's economic, industry, and increase productivity.

2.2.3 Existing Learning Source about AI

2.2.3.0.1 University Curriculum about AI in Thailand In some universities, AI education exists in the form of an extra credit that students can choose to apply.

https://www.admissionpremium.com/content/5909 shows the courses that major in AI engineering. There are only 2 public universities that currently have the AI engineering department which are King Mongkut's Institute of Technology Ladkrabang and Chulalongkorn University. Others are private universities which are considerably more costly than private universities.

2.2.4 Online AI courses and Educational Programming Games

There are a lot of online courses available for learning AI such as Udemy, coursera, edX, and so on. There are also educational games for learning coding fundamentals such as Code Combat, Minecraft: Hour of Code, Scratch, and lots more. But when it comes to educational games for AI, there are quite a few. Some are focused on competitive AI coding which is not friendly for beginner.

https://studio.code.org/s/oceans/ This is an interesting example of games that teach the concept of AI. It has a great design and concepts, cute gameplay, and good for learning the basic of AI and image recognition.

2.2.4.0.1 Educational Games and Programming

https://www.researchgate.net/publication/305084679_Learning_Programming_through_Games_
and_Contests_Overview_Characterisation_and_Discussion reviews some good platform to learn programming.

https://www.researchgate.net/publication/267034149_Educational_Games_for_Teaching_Computer_Programming discusses about important characteristics of educational coding games. Additionally, it goes over some educational programming games and their uniqueness as well.

https://files.eric.ed.gov/fulltext/EJ1233506.pdf explores the effectiveness of using games to teach programming concepts and problem solving skills. The game used in this research is PROSOLVE. These researches provide us with great resource of how our game should be in order to be effective for the players to learn while playing. It also proves that games are useful for learning programming concepts as well.

2.3 Development Tools

2.3.1 Miro

https://miro.com/app/dashboard/ is an online whiteboard and visual collaboration platform. This is what we use to organize our ideas, storyboard, and role as it is a good tool for working and brainstorming online.

2.3.2 Notion

https://www.notion.so/ is an application that provides components such as notes and databases. Providing lots of tools and blocks, notion can help users their own systems for note taking and data management. We use it to store our information and meeting notes.

2.3.3 Microsoft Planner

https://tasks.office.com/mail.kmutt.ac.th/en-US/Home/Planner/ is a project management tool that will help users manage their tasks and projects. We use it to distribute tasks and our project timeline.

2.3.4 Fire Alpaca and Clip Studio Paint

https://firealpaca.com/ and https://www.clipstudio.net/en/ are tools for creating computer graphics. We use these to create pixel art for maps and sprites in our games.

2.3.5 Garage Band

https://www.apple.com/mac/garageband/ is a line of digital audio workstations for macOS, iPadOS, and iOS devices that allows users to create music or podcasts. We use this tool to create soundtracks and background music for our games.

2.3.6 GitHub

https://github.com/ is a provider of Internet hosting for software development and version control using Git. We use it to share our code, work collaboratively online, and manage the version control for our game.

2.3.7 Godot Engine

https://godotengine.org/ is a cross-platform, free and open-source game engine released under the MIT license. We use this tool to develop our game because it is well documented, beginner friendly, and appropriate for our game.

CHAPTER 3 PROPOSED WORK

3.1   Graphic Designs

This is graphic design

3.2   Puzzle Design

This is puzzle design

3.3   UXUI Design

This is uxui design

3.4   Game Story

This is the game story

3.5   Music Design

This is music design

3.6   Dialogue and Interaction

This is the interactions

CHAPTER 4 IMPLEMENTATION RESULTS

CHAPTER 5 CONCLUSIONS

5.1 Problems and Solutions

State problems and how you fixed them

5.2 Future Works

What could be done in the future to make your projects better.

APPENDIX A
FIRST APPENDIX TITLE

Put appropriate topic here

APPENDIX B
SECOND APPENDIX TITLE

Put appropriate topic here

Next, we show how $\mathrm{Var}\{X_n\}$ can be determined. Let $C_\lambda(l)$ be the autocovariance function of λ_n. The MVA technique basically approximates the input process λ_n with a Gaussian process, which allows $\mathrm{Var}\{X_n\}$ to be represented by the autocovariance function. In particular, the variance of X_n can be expressed in terms of $C_\lambda(l)$ as

$$\mathrm{Var}\{X_n\} = nC_\lambda(0) + 2\sum_{l=1}^{n-1}(n-l)C_\lambda(l) \tag{B.1}$$

Add more topic as you need

Therefore, $C_\lambda(l)$ must be known in the MVA technique, either by assuming specific traffic models or by off-line analysis in case of traces. In most practical situations, $C_\lambda(l)$ will not be known in advance, and an on-line measurement algorithm developed in [**?**] is required to jointly determine both n^* and m_x. For fGn traffic, $\mathrm{Var}\{X_n\}$ is equal to $\sigma^2 n^{2H}$, where $\sigma^2 = \mathrm{Var}\{\lambda_n\}$, and we can find the n^* that minimizes (**??**) directly. Although λ can be easily measured, it is not the case for σ^2 and H. Consequently, the MVA technique suffers from the need of prior knowledge traffic parameters.