



國立臺灣大學

National
Taiwan
University

備審資料

- 申請科系：國立臺灣大學資訊工程學系
- 申請人：林坤逸 Kun-Yi Lin
- 畢業學校：揚子學校財團法人雲林縣揚子高級中等學校



臺灣大學 資訊工程學系暨研究所

Department of Computer Science & Information Engineering



Living 、Coding 、Dreaming

#define 個人專長

- 01 文書處理
- 02 程式編碼 Engineering
- 03 英文溝通能力

#define 休閒興趣

- 01 撰寫程式及研究電腦資訊
- 02 下圍棋、軍棋
- 03 觀看小說、動畫
- 04 研究數學難題

#define 證照

- 01 全民英檢中高級通過
- 02 中華民國圍棋協會業餘二段



#define 未來規劃

- 01 準備應考多益TOEIC測驗
- 02 取得APCS證照
- 03 學習第三語言
- 04 鑽研遊戲開發設計



林坤逸 Kelvin

//個人特質與能力

資訊能力

我能夠有效的運用電腦軟體或撰寫程式解決生活上的困難。

領導能力

知人善用，可以將分配成員各自適合的任務，並控制專案進行節奏。

表達能力

不善於和他人交際，因此參與了許多語文競賽訓練口才。

推理能力

可以藉由觀察線索進行邏輯推演，在有限的知識下分析問題。

//比賽經歷

2018/10/26
雲林縣說故事比賽
A組第六名



2023/03/15
全國高級中學小論文寫作比賽
特優



2023/04/19
第63屆國立暨縣(市)公私立高級中等學校第四區分區科學展覽會
優等



2023/10/15
2023 年臺灣能永續能源創意實作競賽高中職綠能創新組
入選



2024/01/26
2024 IEYI臺灣選拔賽
銅牌



2024/04/09
第64屆國立暨縣(市)公私立高級中等學校第四區分區科學展覽會
佳作



//幹部經歷

高一副班長
112/09/01~113/01/19

高三 oo長
113/09/01~114/01/19

科展社指導
112/09/01~113/01/19

科展社副社長
113/02/16~113/07/01

關於我

// 樂於探索的性格

我出生在雲林縣虎尾鎮的一個小家庭，父親在六輕工作，母親在我出生後擔任全職家庭主婦。我喜歡一個人自由自在的研究、探討抽象的事物。小時候居住在公寓沒辦法跑跑跳跳，卻因此培養了對於閱讀的熱愛，喜歡翻閱家中的各種報章雜誌、繪本圖書，引燃了我對這個世界的好奇心。童年時期的每逢放假時鮮少去遊樂園，而是前往台灣的各種科學、歷史博物館參觀，沉浸在自然數理的世界之中。而我的母親也會盡可能的為我創造自由探索的環境，讓我可以親手作各種自然實驗，如自製石蕊試紙、直流馬達，或是用家中的簡易顯微鏡製作標本觀察生活周遭的生物。



國小酸鹼試劑實驗

// 英文表達能力的培養

我的家庭相當注重英文能力的養成，國小的我已經培養了基本的英語能力，可以自然閱讀基礎的英文書籍，並使用英文和外籍人士進行會話，而高中時通過全民英檢中高級複試。此外，為了改善我先天膽怯怕生的性格，我在國小到高中的學習歷程中時常代表學校參加校外演講或說故事比賽，校內比賽曾獲得英文演講比賽第一名、英文說故事比賽第一名、國文演講第二名，校外比賽曾獲得英文說故事第六名、英語讀者劇場第五名。



中高級英檢複試通過

| 字首Prefix | NO. A-1-1 |
|---------------|--|
| 方向 | DATE |
| 向上↑ | |
| ana- | "向上" "相同" e.g. analyze 分析 analogy 類比 |
| a- | "朝向" "在...之上" e.g. ashore 在岸上 abroad 在境外 |
| epi- | "上方" e.g. epicenter 震央 epigastric 上腹部的 |
| hyper- ↗ hypo | "上方" "過度" e.g. hyperactive 過動的 |
| over- | "過度" "在上方" e.g. overflow 沖溢 overcoat 外套 |
| super- | "在...之上" e.g. superior 上級的、較優的 |
| supra- | "在上方" "超越" e.g. supranational 超越國家的認同... |
| sur- | "在...上方" e.g. surface 表面 surrounding 周遭 |

字根表(節錄)

學習英文的過程，我會善用資訊科技輔助學習，如使用Anki背單詞、用podcast練習聽力，並利用字根表幫助我更容易記憶單字。英文能力很大程度的幫助了我在準備科展查找資料、在大型比賽用英文發表作品的過程。

//圍棋與邏輯分析

圍棋在我的成長過程中扮演了很重要的角色。學習圍棋能夠改變一個人的氣質，並逐漸養成理性思維。從圍棋中，我開始養成**分析事情來龍去脈的能力**，學習再攻防之中從對手的棋路推斷對方的動機。因此，當我看到物理化學的公式時，也會嘗試著去推測公式是如何推導演變，從而對於一個方程式也有了更深刻的理解。此外，在圍棋的攻防中，也培養了我抽象思考的能力，讓我更能夠在腦海中**圖像化思考**，對於我學習抽象的電腦科學增益匪淺。



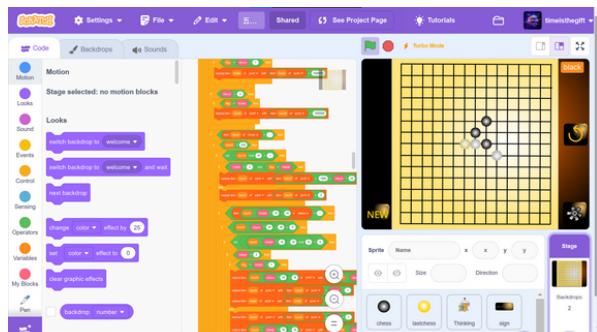
參加圍棋比賽

//對於電資領域的興趣

對我來說，小時候接觸到的**樂高機器人**最先引起我對於電資領域的興趣。我曾經利用樂高機器人建立了一台自動避障車，我仿效了科研撰寫了一本**實驗日誌**紀錄設計時遇到的問題以及測試的結果，並上網學習齒輪差速器與傳動軸的原理，並下載專用軟體進行程式設計，讓我在機械資訊領域收穫良多。



樂高自動避障車



五子棋專家系統

在電機領域，我將**樂高機器人**的伺服馬達當成轉動傳感器，並連接兩個觸碰感應器**連上筆記型電腦**。國小時的我還不會開發Windows應用程式，便使用了**Scratch**撰寫一個**賽車遊戲**，搭配自製手柄進行遊玩。以上的經驗讓我對於電機合資訊領域充滿了濃厚的興趣。



自製賽車遊戲握柄

另外個讓我深愛資訊科技的啟蒙者是MIT開發的**Scratch**軟體。小學時，我用Scratch撰寫了許多遊戲以及計算工具。我曾經用Scratch寫出一個**自動下棋機器人**，AI會根據棋子連線長度自動給予加權分數計算出最佳下法。

比賽歷程

//1120315梯次全國高級中學小論文寫作比賽 獲得特優

在了解YOLO演算法運作原理後，身為雲林人的我們覺得這項科技可以應用在農業上，因此，我們結合了YOLO演算法和可以即時回傳影像的TELLO無人機，並根據影像調控無人機的飛行軌跡，建立了一個自動驅逐有害鳥類獮猴的無人機系統，報告在小論文比賽中獲得特優。



測試無人機串流影像

//第64屆公私立高級中等學校第四區科展 獲得優等

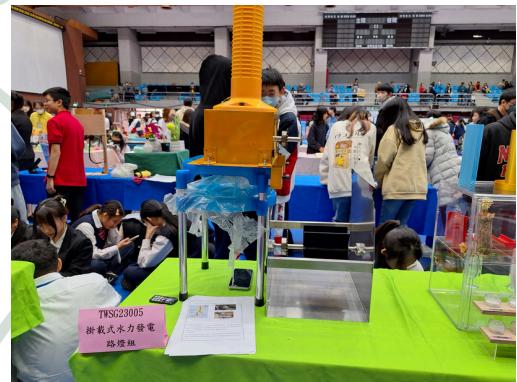
在瞭解到學校有學生家裡從事錦鯉魚產業後，我們將YOLO的應用的目光投向了錦鯉魚產業上。我們在深入了解後發現錦鯉魚是適合台灣發展的高附加價值產業，因此我們建構了一個既適合賣家更適合買家使用的錦鯉魚辨識系統，讓對於該產業有興趣的初學者可以更深入的認識自己手上錦鯉魚的品種以及預估價格、疾病等相關資訊。



錦鯉魚品質檢測系統

//2024 IEYI臺灣選拔賽 獲得銅牌

在課堂上，我們學習到了有關於SDGS的相關理念，我們也希望能夠為永續能源盡一份心力。此外，我們想要解決在我們鄉下，因夜晚照明不足導致事故頻傳的問題，所以我們想到可以利用農田水圳的微水力的概念結合簡便的照明裝置，將防撞桿變成能夠自主發電的照明工具。過程中，我第一次正式接觸到了Arduino開發板，並了解藍牙傳輸及紅外線感應器的工作原理。



掛載式水力發電路燈

學習歷程

//線上教學與網路資源

國中時COVID-19意外的襲來徹底改變了學生的學習模式，許多人的學習狀況因而大受影響。然而，在國中時，我卻依然考出了5A++的成績，我認為其中一大部分必須歸功於網路資源的活用。網路化的教學模式非但沒有中斷我的學習

，反而因為我可以是用電腦查找資料、藉由影片學習，並利用專門背單字的軟體和規劃時間的工具提升學習彈性、效率。從那時候，我也培養了用電腦軟體規劃工作的排程能力，以更有效率的運用時間。我相信這個能力也能讓我在往後的大學學習能夠有更好的成效。

//課業與競賽並重的學習生涯

從國小到高中，我不間斷的參與各種比賽，如作文比賽、演講比賽、科學比賽等，在許多的比賽中獲得佳績。與此同時，我認為課業學習是參加這些比賽的基礎，學習可以讓我在比賽中有更多的知識可以靈活運用。因此，在國小與國中我皆以縣長獎的成績畢業，迄今每學期的成績也都保持在1%之內。

//自學程式語言的過程

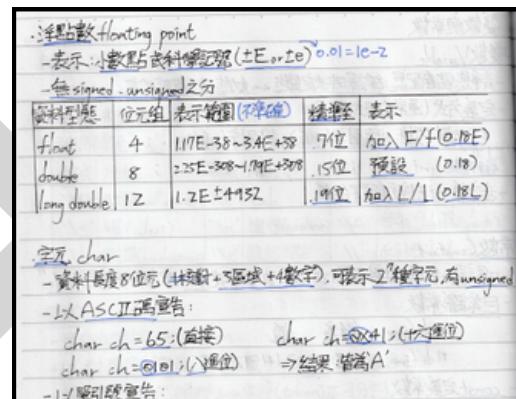
我的程式語言能力仰賴自學而成，我會撰寫C++和Python兩種程式語言，也能大概看懂前端網頁的Javascript腳本。我在學習程式的過程以書本為主、影片為輔。我會將書中的重點整理成一本筆記本，再配合影片的相關說明與習題重複加深函數或語法的印象，並藉由實做題目內化知識。



使用電腦規劃學習進度



縣長獎頒獎典禮



自學C++語法筆記

//應用GitHub的檔案同步系統

上了高中之後，我開始學習應用各項程式開發平台，便從而接觸到了Git版本控制系統合GitHub平台。當時我正面臨在不同電腦間同步資料的問題，因此便寫了一段執行檔bat腳本，結合github進行檔案定時同步處理。也是有了這個契機，讓我瞭解到程式可以解決生活上的許多問題。

```

Active code page: 65001
Git for Windows 2.45.1.windows.1 (64-bit)
$ git clone https://github.com/kelvinlink/kelvinlink/allDoc.git
origin https://github.com/kelvinlink/kelvinlink/allDoc.git (fetch)
origin https://github.com/kelvinlink/kelvinlink/allDoc.git (push)
remote: Counting objects: 100K (6/6), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 4 (delta 3), reused 4 (delta 3), pack-reused 0
Unpacking objects: 100% (4/4), 27.27 KB | 11.00 KiB/s, done.
From https://github.com/kelvinlink/kelvinlink/allDoc
 * [new branch] master      -> origin/master
Branch 'master' set up to track remote branch 'master' from 'origin'.
Fast-forward
...213/261/345/121/207... + 358/360/361/345/1254.docx" | Bin => 36370 bytes
1 file(s) transferred, 0 byte(s) received, 0 seconds elapsed
create mode 100644 "\345\261\260\345\1242\236\1207\246\1226\1231\345\244\276\1358\213\261\345\1212\207... \358\244\287\346
134\1214.docx
git push https://github.com/kelvinlink/photo.git (fetch)
origin https://github.com/kelvinlink/photo.git (push)

```

檔案同步系統

//C++程式學習

寫程式對我來說除了能夠解決生活上的問題，也是探討數理科學的助手。當學習到勾股定理時，便對於能夠組成直角三角形的整數邊長感到興趣。於是，在經過思考後，我用了計算最小公倍數的函數結合遞迴方法，成功算出了近千組樹對符合條件。

```

1 #include<iostream>
2 #include<fstream>
3 using namespace std;
4 int inline gcd(int m, int n) {
5     while(n != 0) {
6         int r = m % n;
7         m = n;
8         n = r;
9     }
10    return m;
11 }
12

```

程式碼節錄

Python程式應用

當瞭解到現實生活中有許多可憐的人們因為遊戲的抽卡機制被騙走了許多金錢，我與同學便利用Python的繪圖分析繪製了遊戲官方卡池數據與實際抽卡結果的比較，發現官方數據與實際同季節果有些微差距，我們也將此結果撰寫成了小論文並獲得甲等。

```

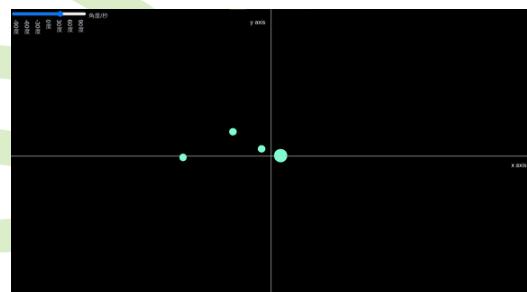
1 import matplotlib.pyplot as plt
2 import numpy as np
3 import matplotlib
4 matplotlib.rcParams['font', family='Microsoft JhengHei', size=25)
5
6 def pmf(num):
7     p=0.994**min(73,num)
8     if num<74:
9         p=p/0.994*0.006
10    else:
11        for i in range(0,(num-73-1)):
12            p*=1 - (0.006 + 0.06 * (i+1))
13            p+= 0.006 + 0.06 * (num-73)
14    return p
15
16 def pdf(num):
17     p=0.994**min(73,num)
18     if num>73:

```

程式碼節錄

/* JavaScript程式應用 */

在數學課學到隸美弗定理後，我將相關公式參數寫成了一個HTML頁面，並套用JavaScript腳本結合隸美弗定理讓球體進行拋物線、橢圓軌道等物理運動，並順利執行。



About Me

//An adventurous spirit

I was born into a small family in Huwei Township, Yunlin County. My father worked at the Sixth Naphtha Cracking Plant, while my mother became a full-time homemaker after my birth. I enjoy exploring and studying abstract concepts independently. Growing up in an apartment where I couldn't run around freely, I developed a passion for reading. I loved flipping through various newspapers, magazines, and picture books at home, which ignited my curiosity about the world .During my childhood, instead of frequently visiting amusement parks during holidays, I often went to various science and history museums across Taiwan, immersing myself in the world of natural sciences and mathematics. My mother also made every effort to create an environment conducive to free exploration for me. She allowed me to conduct various natural experiments hands-on, such as making litmus paper, DC motors, or using a simple microscope at home to observe the organisms around us.

//Cultivation of English expression skills

My family placed significant emphasis on developing English proficiency. Even in elementary school, I had acquired basic English skills, enabling me to naturally read English books and engage in conversations with foreigners. By high school, I had passed the high-level section of the General English Proficiency Test. Moreover, to overcome my inherent shyness and fearfulness, I frequently represented my school in external speech or storytelling competitions from elementary to high school. I achieved first place in the school's English speech competition, first place in the English storytelling competition, and second place in the Chinese speech competition. In external competitions, I ranked sixth in the English storytelling competition and fifth in the English Reader's Theater competition. Throughout my English learning journey, I made effective use of information technology to aid my studies. For instance, I utilized Anki for vocabulary memorization, practiced listening skills through podcasts, and utilized root word tables to facilitate easier word retention. My English proficiency significantly aided me in researching for science fairs and presenting works in large-scale competitions.

//Go and logical analysis

Go has played a significant role in my growth journey. Learning the game has the power to transform one's temperament and gradually foster rational thinking. Through Go, I began honing my ability to analyze situations comprehensively, learning to infer my opponent's motives from their moves in the game. Consequently, when faced with physics or chemistry formulas, I instinctively try to deduce their derivation and evolution, leading to a deeper understanding of equations. Furthermore, the strategic gameplay of Go has nurtured my capacity for abstract thinking, enabling me to visualize concepts mentally, which has greatly benefited my study of abstract computer science.

//Interest in the field of electrical and IE

For me, my interest in the field of electrical and information engineering was first sparked by my childhood exposure to LEGO robotics. I once built an automatic obstacle-avoidance car using LEGO robotics. Following a scientific research approach, I documented the design process, including encountered challenges and test results, in an experiment logbook. I also went online to learn about the principles of gear differentials and transmission shafts, and downloaded specialized software for programming. This experience proved to be highly rewarding for me in both mechanical and informational domains.

Another significant influence that deepened my love for information technology was Scratch software developed by MIT. During elementary school, I used Scratch to create numerous games and computational tools. I once developed an automated chess-playing robot using Scratch, where the AI would calculate the best move based on the weighted scores assigned according to the length of connected chess pieces.

In the field of electrical engineering, I utilized the servo motors from LEGO robotics as rotational sensors, connecting them to a laptop with two touch sensors. During elementary school, before I knew how to develop Windows applications, I used Scratch to write a racing game, which I played using a homemade controller. These experiences instilled in me a profound interest in the intersection of electrical and information engineering.

Competition

//National Senior High School Essay Writing Competition

understanding the operation principle of the YOLO algorithm, as residents of Yunlin, we believed that this technology could be applied in agriculture. Therefore, we combined the YOLO algorithm with the TELLO drone, which can provide real-time image feedback. We controlled the flight trajectory of the drone based on the images to establish an automated drone system for expelling harmful birds and monkeys.

//Science Fair

After learning that some students' families were involved in the koi carp industry, we directed our attention towards applying YOLO technology in this field. Through further research, we discovered that koi carp is a high-value-added industry suitable for development in Taiwan. Therefore, we developed a koi carp recognition system that is not only suitable for sellers but also more accessible for buyers. This system allows beginners interested in the industry to gain a deeper understanding of the varieties of koi carp they possess, as well as estimate prices, diseases, and other relevant information.

//The IEYI Taiwan Selection Competition

In our classroom, we learned about the concept of SDGs (Sustainable Development Goals), and we wanted to contribute to sustainable energy efforts. Additionally, we aimed to address the issue of frequent accidents in our rural area due to inadequate lighting at night. We came up with the idea of using the concept of micro-hydropower from irrigation ditches in fields combined with simple lighting devices, transforming roadside barriers into self-powered lighting tools. During this process, I was introduced to the Arduino development board for the first time and gained an understanding of how Bluetooth transmission and infrared sensors work.

Learning Portfolio

//Online learning and internet resources

During junior high school, the unexpected arrival of COVID-19 completely changed the learning mode for students, impacting many people's learning conditions. However, during junior high school, I still achieved a grade of 5A++, and I believe that a significant part of this success is attributed to the effective use of internet resources. The online teaching mode not only did not interrupt my learning but also enhanced my learning flexibility and efficiency. I could search for information on the computer, learn through videos, and utilize software for vocabulary memorization and time management tools to improve my learning process. Since then, I have also developed the ability to schedule tasks using computer software, allowing me to utilize time more efficiently. I believe this skill will also contribute to better results in my university studies.

// Balance between academics and competitions

From elementary school to high school, I continuously participated in various competitions such as essay contests, speech competitions, and science competitions, achieving commendable results in many of them. At the same time, I believe that academic learning forms the foundation for participating in these competitions. Learning provides me with more knowledge that I can flexibly apply in competitions. As a result, I graduated from both elementary and junior high school with county-level awards, and my grades have consistently remained within the top 1% each semester.

//Self-learning programming languages

My proficiency in programming languages is largely self-taught. I am proficient in writing code in both C++ and Python, and I can also understand JavaScript scripts for front-end web development to some extent. In my learning process, I primarily rely on books supplemented by videos. I compile key points from books into a notebook, reinforce my understanding of functions or syntax through related explanations and exercises in videos, and internalize knowledge by implementing practical coding tasks.

為什麼我想讀資工系？

//資訊工程學系學程

當我第一次認識資訊工程學系時，我對於這個學系的研究領域充滿興趣。對於喜歡研究抽象問題的我，研究資訊工程令我相當著迷。此外，也許是受圍棋影響，我也相當喜歡運用理性的方法一步步解決問題，所以我對於演算法的運作充滿好奇。最後，能夠將書本中看似永遠都用不到的數學公式轉換成生活中不可或缺的電子工具，對我來說是一件相當神奇的事情。因此，我一直希望能夠在第一學府學習這些技能。

//當我認識臺灣大學的資訊工程學系

臺灣大學在國內外享有卓越的學術聲譽和優秀的校風，這讓我深受吸引。此外，我對人工智慧領域抱有濃厚的興趣，而臺灣大學資訊工程學系在此領域的專業知識和研究領域正是我所嚮往的。我相信，在這樣一個充滿活力和創新的學術環境中，我將有機會探索和深化自己的興趣，並將其轉化為實際的學術成果。我希望能在資訊工程學系的教授和專業人士指導下，進一步發展我的專業能力和學術潛力。我相信，貴校優秀的教學資源和研究環境將為我提供廣闊的發展空間，幫助我實現自己的學術和職業目標。

一、短程讀書計畫（錄取到開學）

高三：完成高三課業加強數學及英文能力，並取得APCS證照
高三暑期：考取多益(TOEIC)黃金證照並學習第三外語

二、中程讀書計畫（大學階段）

大一：學習微積分與線性代數，並研究資料結構與演算法
大二、三：學習計算機概論，並加強程式設計能力，探索未來出路
大四：接觸相關產業或繼續攻讀研究所

三、遠程讀書計畫（畢業以後）

就職路線：學習Linux平台應用、學習遊戲設計的相關技術
研究路線：鑽研人工智慧相關技術，並學習PyTorch、Tensorflow等架構的使用。

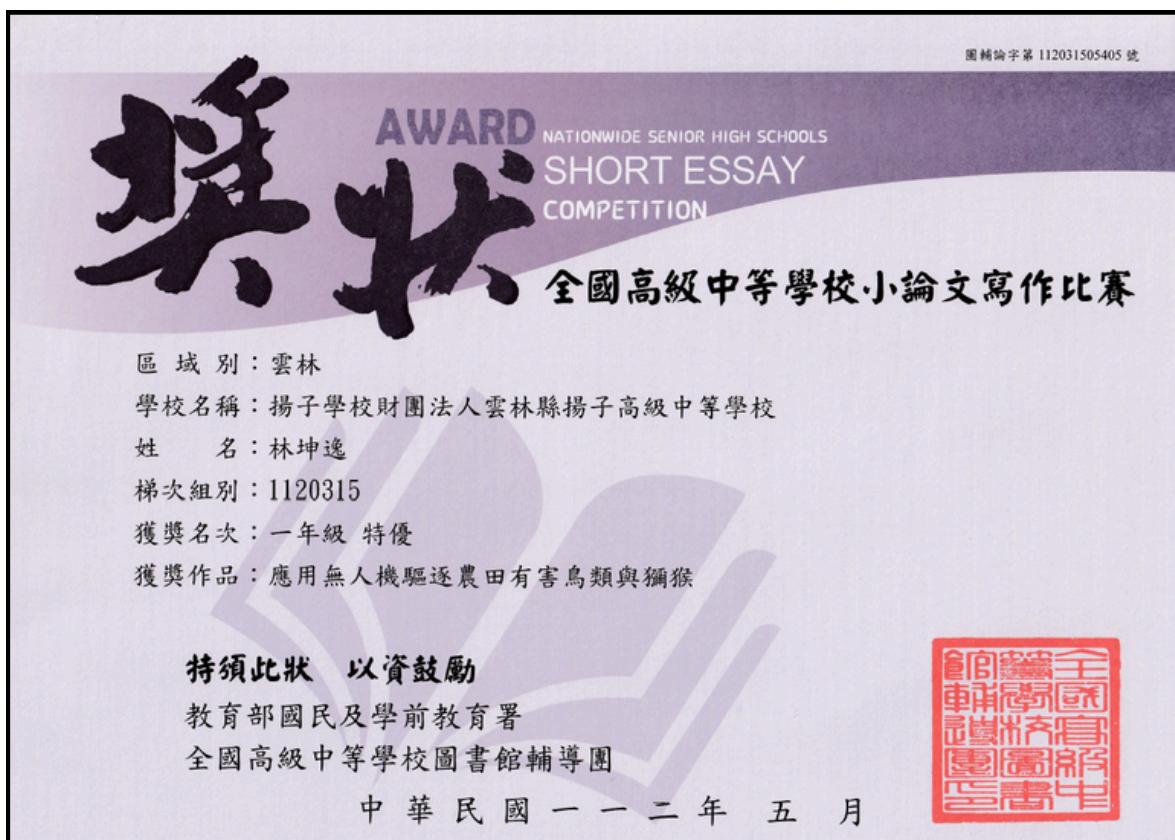
競賽獎狀

校外競賽

地方科展



全國小論文寫作



競賽獎狀

台灣能永續能源實作競賽



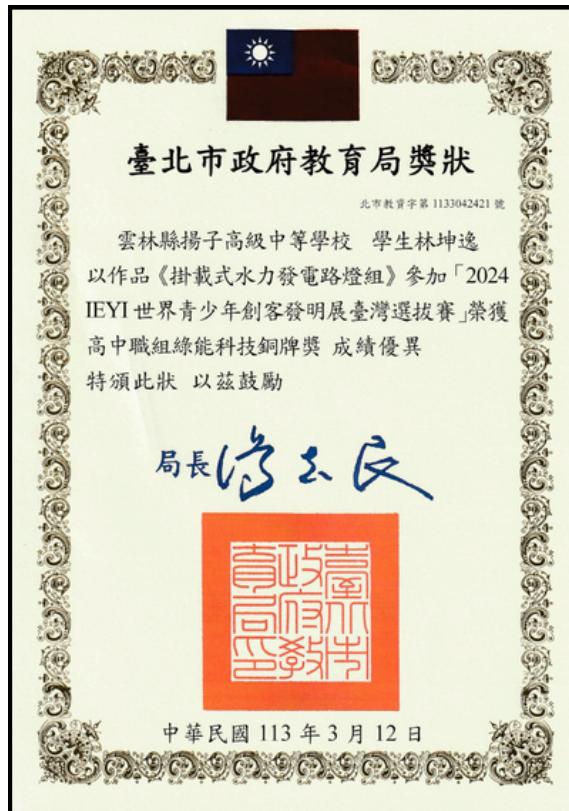
台灣能永續能源實作競賽



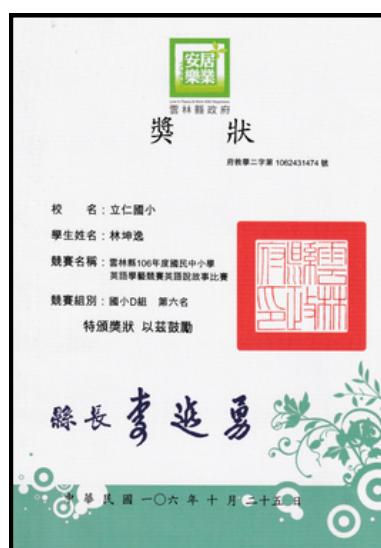
全國中學英文演講比賽



IEYI 台灣選拔賽



雲林縣英文學藝競賽



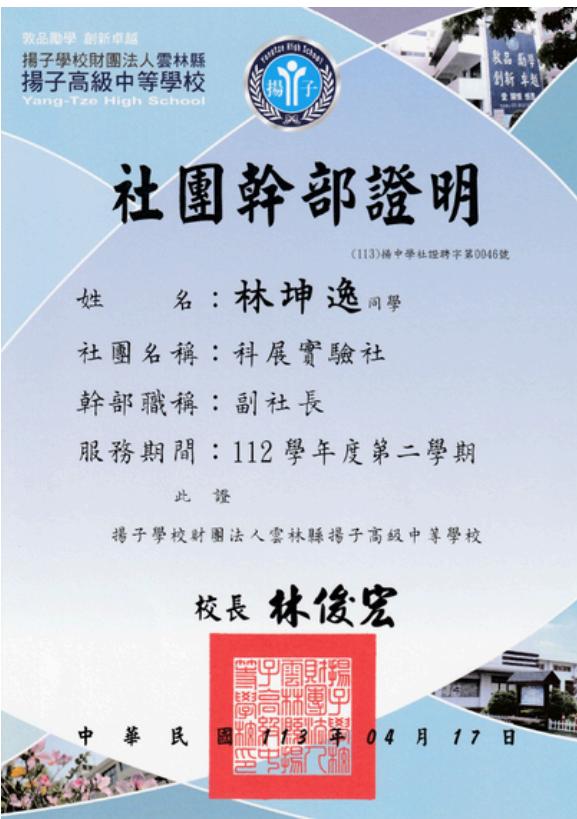
證明文件

幹部證明

班級幹部



社團幹部



證明文件

證照證書

全民英檢中高級複試證照



中華民國棋協二段證書

APCS



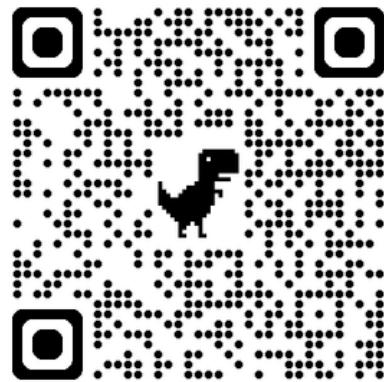
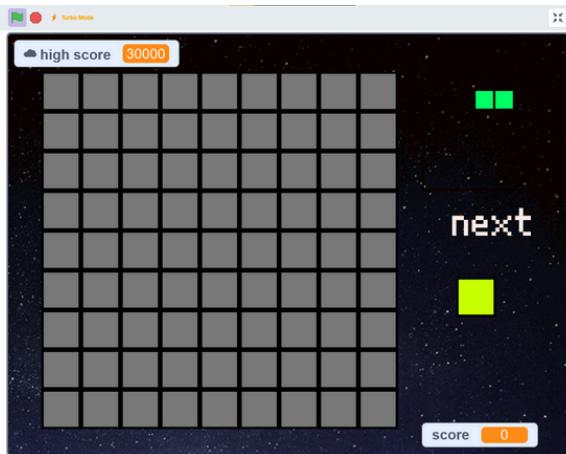
有空去考

外部連結

程式作品

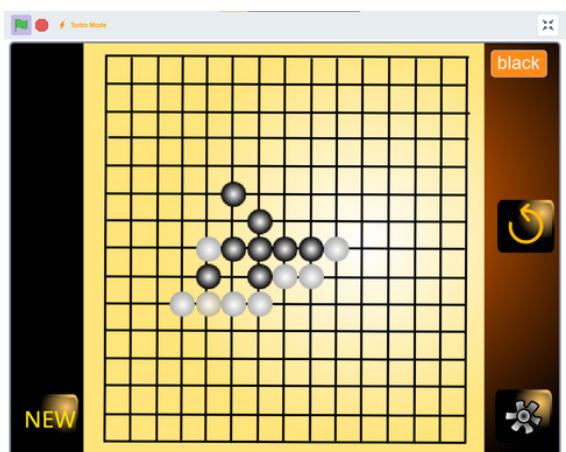
Scratch木頭拼圖

<https://turbowarp.org/1027757820?turbo>



Scratch五子棋機器人

<https://turbowarp.org/655103105?turbo&hqopen>



原神抽卡模擬器

<https://kelvinlinkk.github.io/genshin/card.html>



JavaScript物理模擬器

<https://kelvinlinkk.github.io/rotate.html>

