

# CHIEN-KAI KUO

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## EDUCATION

### National Cheng Kung University

2018-2023

Bachelor of Science in Architecture : Engineering Division

3.60/4.30

- Overall GPA: 3.6/4.3 | Last 60 credits: 4.13/4.3 | CS-related credits: 4.27/4.3
- Class Ranking: 2022 fall: 1 | 2022 spring: 2 | 2021 fall: 3 (last 3 semesters)
- CS-related courses: Data Structures(A<sup>+</sup>), Algorithms(A<sup>+</sup>), Object Oriented Programming(A<sup>+</sup>), Operating Systems(A<sup>+</sup>), Computer Organization(A<sup>+</sup>), Intro to Artificial Intelligence(A<sup>+</sup>), Computer Vision and Deep Learning (A<sup>+</sup>), The Integration of AR/VR(A<sup>+</sup>), Image Editing Introduction (A), Computer Vision Based Robotic Fabrication(A)

## WORK & RESEARCH EXPERIENCE

### Front-end Developer - Academic Expertise and Social Network Analysis Platform

Feb. 2023 – Jun. 2023

National Science and Technology Council & Knowledge Discovery Laboratory, Engineering Science dept., NCKU

Tainan, Taiwan

- Developed nationwide website for analyzing and presenting Taiwan scholars' research orientations and social networks (over 7900+ scholars and 60K+ projects) in Single Page Application(SPA) using Angular and Django framework.
- Implemented 10+ dynamic interactive graphs/charts and search bars through Bootstraps and ng-Zorro in framework with a human-centered dashboard via RESTful APIs & HTML5/CSS3/JavaScript/TypeScript, optimized 30% graph rendering time.
- Designed intuitive User Interface for main visualization page and through Figma and Adobe XD in Responsive Web Design (RWD).

### Blockchain Researcher

Oct. 2021 – Mar. 2022

BeeQuant Global Quantitative Trading Company

Taipei, Taiwan

- Researched 50+ Web3.0 market investment targets (Crypto Currency & NFT), producing 30+ analysis reports.
- Developed automated trading strategies in Python via Binance and FTX Exchange API, boosting quarterly profits by 23%.

### Fintech CopyWriter Intern

Jun. 2021 – Jan. 2022

Golden Financial Exploration Association (registered Nonprofit Organization (NPO) in Seattle, WA)

Remote

- Authored 30+ articles/posts covering U.S. financial news and marketing trends via Canvas, increasing monthly 2K+ reaches.
- Developed Python web crawlers independently to extract financial statements data, reducing manual input costs up to 37%.

### Research Assistant - Computational Geometry

Jul. 2021 – Sep. 2021

Computational Design Research Laboratory, Architecture dept., NCKU

Tainan, Taiwan

- Conducted 10+ experiments on generative algorithm and geometric variability of linear vectorial graphs on a Cartesian coordinate system via Python's turtle graphics package.

### Architecture Design and Urban Planning Intern

Jul. 2020 – Sep. 2020

IHES Architects

Tainan, Taiwan

- Conducted 25+ related cases analysis and on-site base surveys for government bidding proposals.
- Developed 10+ 3D models of architecture projects and field planning using Rhinoceros and SketchUP, and Utilized V-Ray to render 15+ high-quality effect images, enhancing architectural designs' visualization for impactful presentations.

### Mechanical Engineer Intern

Jan. 2019 – Mar. 2019

KUOMEX Industrial Company, Ltd.

Taichung, Taiwan

- Operated multi-axes CNC turning center for metal fabrication and programming tool paths.
- Developed 10+ machining processes based on 2D/3D drawings on AutoCAD for simulation verification.

## COMPETITION & ENTREPRENEURSHIP

### 2022 NASA Hackathon - Visualizing the JOVIAN System

Sep. 2022 – Oct. 2022

NASA Space Apps Challenge

Kaohsiung, Taiwan

- Conducted 5 sets of image processing and generating sequential Jovian graphs using Numpy and OpenCV from JunoCam database.
- Led the interdisciplinary team of 4 members to cooperate and collaborate (Design/Electric Engineering/ Biology .etc).

### 2022 IEEE AIOT Competition - Smart Stadium Group

1st PRIZE

Mar. 2022 – Jul. 2022

IEEE Signal Processing Society & Taiwan Tech

Taipei, Taiwan

- Developed real-time dashboard website with interactive BIM-Revit 3D Digital Twin models on Cloud via Autodesk Forge APIs and visualization data charts.
- Integrated IoT sensors (Eagle Eye & ADI Air Detector) via 2 Raspberry Pi SBCs to detect ambient air parameters and synthesize location of people.
- Automated interior devices by predicting changes in air condition via SVM models to decrease the costs up to 37%.

### 2020 NCKU Innovative Dreams Come True Program

ACCEPTED

Feb. 2020 – May. 2020

NCKU Innovation Headquarters & Technology Transfer and Business Incubation Center

Tainan, Taiwan

- Collaborated with Prof.Chung, Pau-Choo (Dean of EECS dept.) to productize the medical equipment.
- Designed the prototypical user interface (UI) and user operating procedures (UX).
- Received \$100,000 NTD funding.

## PUBLICATION

### Building Bert-based No-code Chinese Text Classification Pipeline with MLOps and AutoML: Examples for Specific Topics on Social Media Platforms

Nov. 2023

IN PREPARATION

2024 International Journal of Interactive Multimedia and Artificial Intelligence (IJIMAI)

### The Development of Mixed Reality Application Based on Gesture Recognition: A Study of Spatial Interaction and Perception Enhancement

Mar. 2023

ACCEPTED - 2nd Author

2023 International Design Conference on Integrated Interdisciplinary Innovation (IDCIII)

Virtual-Real Integration and Digital Interaction domain

- Represented team accomplished oral presentation on-site.

## TECHNICAL SKILLS & INTERESTS

**Programming Languages:** Python, Java, C/C++, C#, Solidity, HTML/CSS/JavaScript, TypeScript, LaTeX, RESTful API

**Developer Tools & Operation Systems:** Unity, Arduino, Raspberry Pi, Linux, ROS, MacOS, Windows, Ubuntu OS

**Frameworks & Databases:** Node.js, Angular, Django, Docker, pandas, scikit-learn, Tableau, Cytoscape, Power BI, OpenCV, OpenGL, Pytorch, Tensorflow, Matplotlib, MySQL, MongoDB, jQuery, Web3.js, Selenium

**2D/3D Softwares:** Autodesk Auto-cad, Revit(BIM), Fusion 360(CAD/CAM), Maya, Rhinoceros, Grasshopper, SketchUP, Vray 4, Lumion 8, Blender, Adobe Photoshop, Illustrator, InDesign, Lightroom, Premiere, XD, Figma, Canvas

**Fabrication:** 3D Print, Laser Cutting, Timber/Metal Fabrication, Cement/Plaster Pouring, CNC Lathe Machine, Robotic Arm

## PROJECTS EXPERIENCE

### The Integration of AR/VR for Interaction Design - "AFTER 6 P.M."

Sep. 2022 – Jan. 2023

Full-stack Developer

- Developed gyroscope-based AR Android Game App using C# on Unity Engine platform.
- Designed 3 space escape games with image recognition and gesture detection using Mediapipe, ManoMotion and Vuforia Engine AR SDKs in NCKU Architecture departments, enhancing 67% spatial awareness of participants.

### The Digital Tectonics Construction by Human-Robot Collaboration - "INTERLACE FOREST" Feb. 2022 – Aug. 2022

Architecture Capstone Project in Robotic Arm Tectonics Studio (RATs)

- Designed and implemented a full-scale pavilion (7m\*10m\*3m) fabrication at NCKU campus using 2 Industrial KUKA KR 300 Robot Arms for multi-dimensional drilling and milling of standard wooden lumbers.
- Developed Voronoi-based roof pattern algorithm with Grasshopper and created Python-based tree-bionic algorithm to manipulate parameters for better branch generation.
- Utilized Robot Operating System (ROS) to automate the optimal development path of the robot arms.
- Received Merit Award in 2022 Practical Construction Design Competition and presented at ChengLong Wetlands International Environmental Art Festival.

### The Implementation of Blockchain Smart Contract

Oct. 2021 – May. 2022

NCKU Blockchain Research Club & NCKU CSIE Distributed Ledger Laboratory

- Implemented ERC20 tokens / ERC721 NFTs contracts and published to Rinkeby testnet in Remix IDE.
- Deployed Gaming DApp with web3.js, jQuery, and Infura on AWS EC2 server, tested on Ganache env.

### The Design of Biomimicry Interactive Installation - "BIOLOGY of FEATHERS"

Sep. 2021 – Jan. 2022

Sync Laboratory, Architecture dept., NCKU

- Developed mechanism design using crankshaft engine to drive 30+ feathered components for simulating biological irritation behaviors.
- Integrated 3-phase ultrasonic sensors and SG90 Servos into Arduino UNO embedded system, responsible for the main circuit design and programming development.
- Presented in 2022 Tainan Young Artists empowerment project - Metropolis Meme

## WORKSHOP & TRAINING PROGRAM

### Robotic Manufacturing x Computer Vision Workshop

Aug. 2022 – Sep. 2022

NCKU CSIE Robotics Laboratory & NCKU Robot Aided Creation Construction studio

- Operated ROS for Robotic Arm hand-eye calibration and Tof Depth Camera to conduct Point Cloud modelling via Real-Time Appearance-Based Mapping (RTAB-Mapping).
- Manipulated Visual-Guided Mobile Robot Arms for fabrication with CAD/CAM software -Rhinoceros and Fusion 360.

### Virtual Design Workshop for BIM-based Teamworking

Jun. 2021 – Jul. 2021

Singapore Institute of Technology (SIT) & National Cheng Kung University (NCKU)

- Developed the optimal compatible modes of transportation in Bus Rapid Transit (BRT) system for a post-COVID19 world via BIM.

### Parameter-orientation Design Process Orientation Workshop

Oct. 2020 – Oct. 2020

NCKU Architecture dept. Digital Design Group

- Acquired proficiency in NURBS surface-based software -Rhinoceros3D, algorithmic modeling using parametric package Grasshopper.
- Leveraged computer rendering package -V-ray and software -Adobe Photoshop for material rendering and image post-processing.

### Forex Digital Financial Talents Cultivation Program

Jul. 2021 – Sep. 2021

Taiwan Development Institute

- Acquired knowledge in various financial products, including stocks, Forex, ETFs, and options.
- Utilized MT5 and MultiCharts platforms for Program Trading and developed quantification models with Python.

### Blockchain Hyperledger Fabric Training Program

Apr. 2021 – Jun. 2021

Taiwan Blockchain University Alliance

- Explored 3 Enterprise Blockchain Technologies: Hyperledger Fabric, R3 Corda, ConsenSys Quorum.
- Implemented core architecture of Hyperledger Fabric, involving network construction, and node deployment via Chaincode.

### MassMutual x GFEA Financial Technical Analysis Training Program

Mar. 2021 – May. 2021

Massachusetts Mutual Life Insurance Company & Seattle Golden Financial Exploration Association

- Performed stock/forex technical analysis via line charts (MA, support/resistance line, KD, RSI, five waves theory, etc.)
- Conducted final presentation and received internship opportunity in GFEA.

## CLUBS & EXHIBITIONS

NCKU Blockchain Research Club - Research & Development Group Member

Oct. 2021 – Nov. 2022

NCKU Securities Investment Research Association - Member

Mar. 2020 – Jun. 2020

NCKU Mountaineering Association - Equipment Manager/ Officer

Sep. 2019 – Jul. 2022

- Experienced 15+ of Taiwan Hundred Alpines (over 3000m in elevation), intermediate mountain exploration and snow pre-training.

NCKU Department of Architecture 2019 Exhibition - ArchiTalking

May. 2019 – Jun. 2020

NCKU Department of Architecture 2020 Exhibition - Boundless Plan

May. 2020 – Jun. 2021

Young Artists Empowerment Project 2022 - Metropolis Meme

Apr. 2022 – Jun. 2022

NCKU 111 x 113 x 114 x M.ArchII Joint Exhibition - OVERTURE

Jun. 2022 – Jun. 2022

## EXTRACURRICULAR ACTIVITIES

### Global Goals “Smart” Community Mini Jam

Apr. 2022 – May. 2022

Co-Organizer

Tainan, Taiwan

- Held 2-day international workshop with 30+ participants from Taipei, Tokyo, and Bangkok.
- Developed blockchain-based prototypical applications for Smart Cities to sustain city environment and ecosystem.

### International Volunteer Workcamp in Sri Lanka

May. 2019 – Aug. 2019

Instructor/Event Planner

Anuradhapura, Sri Lanka

- Cooperated with INSPIRED Ltd. in Talawa to organize interracial English Summer Camp (over 60+ pupils from 3 races).

### Working Holiday in Green Island

Jul. 2019 – Jul. 2019

Diving Coach Assistant

Green Island, Taiwan

### International Volunteer Programs in Nepal

Jul. 2016 – Aug. 2016

Teacher/Community Developer

Syangja, Nepal

- Instructed disadvantaged pupils and painted new-building Christian school in the Akrang mountain area of Phedikhola, Syangja.