

## Senior Software Engineer & AI/ML Specialist

A results-driven AI Research Engineer with a Ph.D.-level background in AI and a Master's in Electronics Engineering. I possess a rare, full-stack skillset that bridges low-level hardware design and high-level, cloud-native AI. My expertise lies in architecting and deploying high-impact, full-stack solutions that bridge the gap between hardware, software, and complex scientific theory. I have a proven track record of pioneering novel systems to solve previously intractable challenges, delivering quantifiable results such as a **250% increase in power generation efficiency** and a **100x acceleration in AI-driven protein analysis**. As a tech lead fluent in English and Mandarin, I am passionate about leveraging deep, first-principles thinking to drive digital transformation, optimize large-scale industrial processes, and build high-performance teams to advance the frontier of technology.

## CORE COMPETENCIES

### AI/ML Solution Architecture

- **Enterprise AI Platform Design:** Architected and deployed scalable AI/ML infrastructure supporting multi-terabyte data processing and real-time inference
- **Manufacturing Process Optimization:** Developed AI-driven systems for predictive maintenance and quality control in industrial environments
- **Business Intelligence Integration:** Created AI-powered analytics platforms for capacity planning, demand forecasting, and operational optimization
- **Cloud-Native AI Solutions:** Engineered distributed AI systems across AWS, GCP, and Azure with a focus on cost optimization and performance scaling

### Full-Stack Development

- **End-to-End System Architecture:** Designed complete technology stacks from custom hardware PCBs to cloud-native web applications
- **Industrial IoT Integration:** Built comprehensive SCADA/IoT systems combining embedded systems, real-time data processing, and web-based dashboards
- **Cross-Platform Development:** Delivered production systems across desktop, web, and mobile platforms using modern frameworks
- **API Design & Integration:** Developed high-performance APIs handling critical business data with emphasis on reliability and scalability

### Python with TensorFlow

- **Deep Learning Model Development:** Built and optimized CNN/RNN architectures, achieving 90% accuracy in protein function prediction
- **Production ML Pipeline Engineering:** Designed TensorFlow-based systems with 100x performance improvements over traditional approaches
- **GPU Computing Optimization:** Implemented CUDA-accelerated ML training pipelines with 2x throughput improvements
- **MLOps & Model Deployment:** Established automated ML model lifecycle management with continuous integration and deployment

## Analytical Problem-Solving

- **Complex System Troubleshooting:** Resolved critical technical challenges in power generation systems, achieving 50% thermal efficiency improvements
- **Data-Driven Decision Making:** Applied advanced analytics to optimize manufacturing processes, reducing defect rates by 66%
- **Root Cause Analysis:** Developed systematic approaches to identify and eliminate bottlenecks in multi-million dollar industrial systems
- **Predictive Analytics:** Created forecasting models for capacity planning and resource optimization in semiconductor manufacturing contexts

## Digital Transformation

- **Process Automation:** Led enterprise-wide automation initiatives resulting in 50% efficiency gains and 20% cost reductions
- **Legacy System Modernization:** Transformed manual processes into intelligent, data-driven workflows with real-time monitoring capabilities
- **Change Management:** Successfully guided organizations through technology adoption with a focus on user training and stakeholder alignment
- **Technology Roadmap Development:** Created strategic technology plans aligning business objectives with emerging AI/ML capabilities

## Tech Leadership & Mentorship

- **Cross-Functional Team Leadership:** Managed multidisciplinary engineering teams across hardware, software, and business domains
- **Technical Mentorship:** Developed junior engineers and data scientists through code reviews, knowledge sharing, and project guidance
- **Stakeholder Management:** Collaborated directly with C-level executives, government agencies, and international partners
- **Global Team Coordination:** Led distributed teams across multiple time zones and cultural contexts with a focus on communication and alignment

## PROFESSIONAL EXPERIENCE

### Research Engineer & Principal Innovator

**Han Lin Innovations (Self-Directed R&D / Independent Projects)** | May 2023 – Present | Taiwan

- **Architected and deployed ANotate deep learning system** for protein function prediction using TensorFlow and GCP Cloud Run, achieving **100x speedup over traditional HMMER-based tools** while maintaining **95% accuracy** on Pfam domain classification across 16,714 classes
- **Engineered hierarchical neural network architecture** combining convolutional and bidirectional GRU layers to capture both local amino acid patterns and long-range dependencies in protein sequences
- **Designed and launched Origami Moving Cubes interactive application** using React, Next.js, and Canvas API, featuring synchronized multi-canvas preview system and custom jog wheel interface for frame-by-frame animation control

- **Contributed critical C++ patch to Electron framework** (PR #46703), resolving long-standing Windows API hit-testing issue, improving user experience for millions of users across major applications, including Microsoft VS Code
- **Achieved 30+ advanced certifications** across Google Cloud (Professional ML Engineer, Cloud Architect), Microsoft Azure (Solutions Architect Expert, AI Engineer), AWS (AI Practitioner), and Cybersecurity domains

## Research Engineer

**Lanyang Geothermal Corp** | Jun 2015 – May 2023 | Yilan County, Taiwan

- **Led multidisciplinary engineering team** in designing and constructing Taiwan's first research-grade total-flow geothermal power plant, implementing novel turbine technology that **increased thermal efficiency by 50%** for brine temperatures 150-200°C
- **Engineered breakthrough power stabilization solution** by creatively integrating wind industry rectifiers (Voltsys) with solar inverters (ABB), overcoming critical grid-connection challenges from geothermal pressure fluctuations and enabling **1-year continuous stable grid-tie** operation in collaboration with TaiPower
- **Architected modern SCADA/IoT system** replacing expensive proprietary solutions with a cost-effective open-source stack (Node.js, Vue.js, MongoDB), reducing hardware costs by 90% while enabling real-time monitoring of 100+ sensors and cross-platform accessibility
- **Optimized power output from 70kW to 180kW** (157% improvement) under identical well conditions through data-driven system insights and real-time performance monitoring
- **Designed custom sensor transducer circuit boards** for monitoring voltage, current, frequency, temperature, pressure, and flow rate, improving data sampling rate by 10x and enabling high-frequency historical analysis

## Artificial Intelligence Researcher

**BIOTOOLS Co., Ltd.** | Feb 2019 – Jan 2022 | Taipei, Taiwan

- **Developed and deployed end-to-end neural network models** for protein ontology prediction, achieving **90% accuracy on Gene Ontology, Human Phenotype Ontology, and Disorder Ontology** while reducing compute time by **100x** compared to traditional methods
- **Optimized GPU cluster performance by 2x** through rebuilding data loading pipeline with TFRecords and engineering high-performance ZFS storage server, resolving I/O bottlenecks in multi-GPU training workflows
- **Created STAMP-CLI command-line interface** for Statistical Analysis of Metagenomic Profiles, increasing data analysis efficiency by 50% and deployed as public Docker images for cross-platform compatibility
- **Implemented production ML serving infrastructure** using TensorFlow Serving, Node.js APIs, and Vue.js frontend, enabling real-time protein function prediction at scale

## Senior Software Engineer

**Binflux Inc** | Jan 2017 – Jan 2019 | Taipei City, Taiwan

- **Co-architected modern electronic medical record (EMR) system** in collaboration with embryologists and fertility centers, resulting in a **20% increase in case numbers** through improved workflow efficiency and user experience

- **Implemented automated development toolchain**, reducing development time by 30% through Docker-Compose, Lerna, Conventional-Commits, and StandardJS integration
- **Established a continuous integration pipeline** using Google Kubernetes Engine (GKE) and Cloud Build, later migrating to Amazon EKS and Jenkins, achieving **99.9% deployment uptime**
- **Designed secure IoT system architecture** with network interfaces for microscope CCD cameras, cryogenic label printers, VOC sensors, and barcode scanners using Node.js, FFMPEG, and various industrial protocols (I2C, MODBUS-RTU)
- **Developed blockchain-inspired security system** using WebCrypto ECDSA API with unique client-side private key generation for tamper-proof document integrity

## TECHNICAL EXPERTISE

### AI/ML & Data Science

- **Deep Learning Frameworks:** TensorFlow, PyTorch, Keras, Scikit-learn with production deployment experience
- **Computer Vision & NLP:** CNN/RNN architectures, transformer models, generative AI, foundation models
- **MLOps & Model Management:** Model versioning, automated training pipelines, A/B testing, monitoring
- **High-Performance Computing:** CUDA programming, multi-GPU training, distributed computing optimization
- **Statistical Analysis:** Advanced statistical modeling, time series analysis, experimental design

### Cloud & Infrastructure

- **Multi-Cloud Expertise:** Certified across GCP, Azure, AWS, with deep platform-specific knowledge
- **Container Orchestration:** Kubernetes, Docker, microservices architecture, service mesh
- **Infrastructure as Code:** Terraform, CloudFormation, automated deployment pipelines
- **DevOps & CI/CD:** GitHub Actions, Jenkins, automated testing, release management
- **Database Systems:** PostgreSQL, MongoDB, BigQuery, data warehousing, real-time analytics

### Programming & Development

- **Core Languages:** Python, JavaScript/TypeScript, C#, with expertise in performance optimization
- **Web Technologies:** React, Node.js, Vue.js, Next.js, RESTful APIs, GraphQL
- **Data Engineering:** Apache Spark, data pipeline construction, ETL processes, stream processing
- **System Design:** Microservices architecture, API design, scalability patterns, performance tuning

# RESEARCH & INNOVATION

## Advanced AI Research

- **PhD Research (Biomedical Electronics):** Designed and implemented recurrent neural network models for protein function and structure prediction, developing novel architectures for complex biological sequence analysis
- **Competition Excellence:** Won **1st place (54 teams)** in university ML competition by building a high-performance, CUDA-accelerated CNN from scratch, demonstrating a deep understanding of neural network fundamentals
- **Publication-Ready Research:** Conducted research-grade investigations into novel AI/ML architectures with potential for patent applications and technical publications

## Open Source Leadership

- **Global Community Management:** Led international open-source community with **3.8M+ downloads**, successfully coordinating multilingual team of volunteers across 8 languages, including French, German, Spanish, and Korean
- **Technical Documentation:** Authored comprehensive technical documentation and maintained high-quality codebases used by the global developer community

# GLOBAL EXPERIENCE & COLLABORATION

## International Technical Collaboration

- **US Federal Research:** Spent one year at the National Agriculture Library (Maryland) developing bioinformatics pipelines and contributing to genomic research tools within the federal research environment
- **Japan Research Partnership:** Collaborated directly with biologists at Japan's Nara Institute of Science and Technology (NAIST), architecting custom image processing solutions to accelerate their research initiatives

## Language & Communication

- **Professional Fluency:** English (Near-native, TOEIC 985/990), Mandarin (Fluent), Taiwanese (Native)
- **Bicultural Expertise:** Leverage unique bicultural background (raised in Iowa, USA; based in Taiwan) to bridge communication gaps and drive alignment in multinational technical teams
- **Technical Communication:** Proven ability to translate complex technical concepts for diverse audiences, from C-level executives to technical implementation teams

# EDUCATION & PROFESSIONAL DEVELOPMENT

National Taiwan University | Taipei, Taiwan

**Ph.D. Candidate, Biomedical Electronics and Bioinformatics (Dropped Out)**

- **Dissertation Focus:** "Design and Implementation of Recurrent Neural Network Models for Function and Structure Prediction of Protein Sequences"

- **Research Emphasis:** Advanced neural network architectures, sequence modeling, and computational biology applications
- **Relevant Coursework:** Machine Learning, Deep Learning, Statistical Analysis, High-Performance Computing
- **1st Place, Machine Learning Competition 2014** - Handwritten Chinese Character Recognition (98.1% accuracy, 54 teams)

## Master of Science, Electronic Design Automation

- **Thesis:** "A Genetic Algorithm Approach to Combinatorial Optimization for Targeted Drug Combination Design"
- **Research Focus:** Optimization algorithms, computational modeling, and systems engineering
- **Technical Skills:** Advanced mathematics, statistical modeling, and algorithm development

## National Chiao Tung University | Hsinchu, Taiwan

### Bachelor of Science, Electronics Engineering

- **Foundation:** Electrical engineering fundamentals, computer science principles, and systems design
- **Specializations:** Digital systems, embedded computing, and signal processing
- **Leadership:** Student Association IT Section Chief, Campus event technical coordinator

## Professional Research Experience

### National Agriculture Library | Beltsville, MD, USA | 2014-2015

- Visiting Research Scholar developing bioinformatics tools and genome browsers
- Contributed to the JBrowse open-source genome visualization platform
- Developed Python libraries for genomic feature manipulation and GFF3 validation

### Nara Institute of Science and Technology (NAIST) | Japan | 2013

- Visiting Scholar in the microbiology research laboratory under Professor Mori
- Developed automated image analysis pipelines for bacterial culture research

## Professional Certifications ([View all Certifications](#))

### Google Cloud Platform

- Professional Machine Learning Engineer (2024)
- Professional Cloud Data Engineer (2024)
- Professional Cloud Architect (2024)
- Professional Cloud Security Engineer (2024)
- Professional Cloud DevOps Engineer (2024)
- Professional Cloud Network Engineer (2024)
- Professional Cloud Database Engineer (2024)
- Professional Cloud Developer (2024)
- Professional Google Workspace Administrator (2024)
- Cloud Digital Leader (2024)

- Generative AI Leader (2025)

## Microsoft Azure

- Cybersecurity Architect Expert (2025)
- Azure DevOps Engineer Expert (2024)
- Azure Solutions Architect Expert (2024)
- Azure AI Engineer Associate (2024)
- Azure Data Engineer Associate (2024)
- Azure Security Engineer Associate (2024)

## Amazon Web Services

- AWS Certified Machine Learning Engineer – Associate (2025)
- AWS Certified Data Engineer – Associate (2025)
- AWS Certified Developer – Associate (2025)
- AWS Certified Solutions Architect – Associate (2025)

# PUBLICATIONS & OPEN SOURCE CONTRIBUTIONS

## Peer-Reviewed Publications ([11 total](#))

- **Chen, M.-J. M., et al. (2019).** "The GFF3toolkit: QC and Merge Pipeline for Genome Annotation." *Insect Genomics*, Humana Press: 75-87
- **McKenna, D. D., et al. (2016).** "Genome of the Asian longhorned beetle reveals key functional and evolutionary innovations at the beetle-plant interface." *Genome Biology* 17(1): 227
- **Benoit, J. B., et al. (2016).** "Unique features of a global human ectoparasite identified through sequencing of the bed bug genome." *Nature Communications* 7(1): 1-10
- **Poelchau, M., et al. (2015).** "The i5k Workspace@NAL-enabling genomic data access, visualization, and curation of arthropod genomes." *Nucleic Acids Research* 43(D1): D714-D719

## Major Open Source Contributions

- **Electron Framework** - Critical Windows API fix (PR #46703), improving frameless window functionality
- **JBrowse Genome Browser** - Feature enhancements and bug fixes for genomic visualization
- **GFF3 Python Library** - Genomic feature manipulation and validation tools
- **STAMP-CLI** - Command-line interface for metagenomic analysis with Docker deployment

# AWARDS & RECOGNITION

## Competition Excellence

- **AI CUP 2019 - 2nd Place** (2 out of 469 teams) - Scientific paper sentence classification, solo team achievement
- **Machine Learning Competition 2014 - 1st Place** (1 out of 54 teams) - 98.1% accuracy handwritten Chinese character recognition

- **National HomePage Design Competition 1999 - 2nd Place** - Early recognition for web development excellence

## Research Impact

- **11 peer-reviewed publications** in high-impact journals, including Nature Communications and Genome Biology
- **Major contributions to i5k Workspace@NAL** - Enabling genomic data access for the global arthropod research community
- **Critical bug fix in Electron framework** - Improving user experience for millions of developers worldwide

## TECHNICAL LEADERSHIP & INNOVATION

### Mentoring & Team Development

- **Quickly onboarded and mentored two junior developers** during the first development sprint at Binflux
- **Led cross-functional teams** of engineers and data scientists in geothermal energy research
- **Collaborated internationally** with research teams across Taiwan, the USA, and Japan

### Innovation Philosophy

Driven by **first-principles thinking** and an **interdisciplinary approach**, consistently delivering solutions that bridge hardware, software, and scientific domains. Excel at **identifying novel applications** of established technologies and **creating bespoke tools** that empower researchers and engineers. Proven ability to **translate complex research concepts** into production-ready systems with measurable business impact.

### Technical Expertise Evolution

My unique career trajectory demonstrates **continuous adaptation** to emerging technologies while maintaining **deep technical foundations**. From early expertise in electronics and embedded systems to current specialization in cloud-native AI/ML applications, I consistently **anticipate industry trends** and **invest in cutting-edge skills**. Recent intensive certification achievements across all major cloud platforms reflect a commitment to **staying at the forefront** of technological innovation.

## PROFESSIONAL PHILOSOPHY & VISION

**Bridging Theory and Practice:** My research background, combined with production engineering experience, enables me to **rapidly translate academic innovations** into scalable, maintainable systems that deliver tangible business value.

**Full-Stack Innovation:** Understanding systems from hardware fundamentals through cloud deployment allows me to **optimize performance at every layer** and identify non-obvious solutions to complex challenges.

**Continuous Learning Mindset:** The rapid evolution of AI/ML demands **perpetual skill development**. My 30+ recent certifications demonstrate a commitment to **mastering emerging technologies** and **industry best practices**.



**Impact-Driven Engineering:** Every technical decision is evaluated through the lens of **measurable business outcomes**. Whether achieving 100x performance improvements or reducing infrastructure costs by 90%, I focus on **delivering quantifiable value**.

*Ready to contribute world-class AI/ML engineering expertise to innovative projects that push the boundaries of what's possible. Available for challenging opportunities in research-driven organizations, technology companies, or industry-leading AI initiatives.*

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