Yin-Chen Chen

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Research Objective

I operate a 95-unit smart-residential testbed that generates high-frequency, real-world IoT time series at scale. My research focuses on **risk-estimation–driven weak supervision** (PU/nnPU) under label noise and distribution shift, in close alignment with Prof. **Takashi Ishida**'s work at UTokyo. My goal is to connect theory and deployment by building **reliable, leak-safe** ML systems for dynamic, human-centered environments.

Education

M.S., Engineering Science and Ocean Engineering, National Taiwan University 2009
Lab: Information and Network Application Lab (Advisor: Prof. Ray-I Chang).
Thesis: *Integration of Wireless Access Point and Sensor Networks.*
B.S., Computer Science and Engineering, Tatung University 2006
Prior PhD admission (NTU, 2009; strategically deferred for industry experience).

Research Fit with Prof. Takashi Ishida

- **Learning with noisy/biased supervision**: calibration and *error decomposition* under label noise; validated on my large-scale testbed.
- **PU/nnPU under compound shift**: risk-consistent estimation with scarce positives; **online class-prior** estimation $\pi_p(t)$ and sensitivity analysis.
- **Complementary/partial labels**: leveraging weak signals to regularize PU objectives; consistency under distribution shift.
- **Density-ratio estimation & importance weighting**: handling covariate/target shift at deployment.
- **Evaluation & governance**: shift-aware metrics, leakage control (stratified time-based split), and reproducible benchmark protocols.

Independent Research: Smart Residential Testbed

- **Scale**: 95 units, dual-voltage (110/220V), environmental sensors; 2022–present.
- **Sampling**: 1–60 s logs; multimodal time series with occupancy/usage events.
- **Pipeline**: ingestion → feature store → training/evaluation (nnPU, π_p estimation) → deployment; drift monitoring with density-ratio hints.
- **Governance**: hashed IDs, k-anonymity windows; **leak-safe** splits and research-safe aggregates/synthetic traces for collaboration.

Selected Publications

- Chang, R.-I., Chen, Y.-C., et al. (2022). *Design and Implementation of an IoT Gateway for Zigbee and WiFi.* **WSEAS Transactions on Communications (Journal)**. [PDF] [Google Scholar] (Cited by: 1).

- Chen, Y.-C., Chuang, C.-C., et al. (2009). *Integrated Wireless Access Point Architecture for Wireless Sensor Networks*. **Proc. ICACT (Conference)**. [PDF] [Google Scholar] (Cited by: 15).

Teaching (Part-time Lecturer, CYCU; AI & Programming)

2024/7–2025/6: evaluations weighted mean **4.70**, median **4.70**, IQR **4.653–4.804**; 5 sections, 215 students.
Since 2022: evaluations weighted mean **4.66**; **12** sections, **545** students.
Representative courses: *Introduction to Natural Science and AI*, *Computational Thinking and Programming*, *Introduction of Computer Programming*.
Awards: University-Level Excellent Course Design (2024, 2025).

Professional Experience

Founder & GM, Infowin Technology Co., Ltd., Taiwan 2015–present

- Delivered enterprise systems for finance, education, religious organizations, and real estate, including a multi-currency platform for a Singapore investment firm.
- Led digital transformation for Aichi International Academy (Nagoya): IoT sensors, face-recognition attendance, internal management systems, and the official website.

Software Engineer (UEFI/RAS), IBM Taiwan 2011–2014

- Implemented reliability features that reduced field boot-failure rate across System x servers.
- Conducted root-cause analyses on critical incidents with preventive firmware patches.

Skills

ML: complementary/partial labels, label-noise robustness, PU/nnPU, **class-prior** estimation (π_p), density-ratio estimation, covariate/target shift, risk estimation, time-series analysis.
Software: Python, PyTorch, scikit-learn, Pandas, FastAPI, Next.js, TypeScript, SQL, C/C++.
Systems: IoT architecture, Docker, AWS, on-prem servers, CI/CD.

Languages & Availability

Mandarin (native), English (fluent), Japanese (JLPT N2).
Applying UTokyo PhD (Schedule B, 2026). TOEFL iBT planned (Sep/Oct 2025).
Open to remote/on-site meetings.

志望動機・研究概要（要約）

弱教師あり学習（PU/nnPU）を**リスク推定**の観点から捉え、ラベルノイズおよび分布変動（covariate ／ target shift）が存在する実環境 IoT データに対する**信頼できる**学習を目指します。95 戸のスマート住宅テストベッド（高頻度マルチモーダル時系列）を運用し、**補助ラベル／部分ラベル**、**クラス事前確率** $\pi_p(t)$ の動的推定、**密度比推定**に基づく重要度重み付けを実装しています。リークを避ける時系列分割とシフト認識型の評価指標を採用し、**キャリブレーション**や**不可約誤差**の観点から理論と実装を橋渡しします。これらは**東京大学 GSFS・石田研究室**の研究テーマと強く整合しており、共同研究として貢献可能です。

Last updated: September 19, 2025