

Benjamin Chou

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PROFESSIONAL SUMMARY

3rd-year ECE PhD Student at Purdue University specializing in AI/ML research for audio, music, and multimodal systems. Researching generative model steering, Stem separation, Transformers for error detection, and deepfake detection. Track record of high-impact research, including publications at AAAI, ICLR, WACV and papers currently under review at top-tier venues with exceptional feedback. I am proficient in Audio DSP, Python, PyTorch, Tensorflow, and HPC clusters. I also have organizational and communication skills (experience organizing 3 AI4Music workshops).

EDUCATION

Ph.D. in Electrical & Computer Engineering <i>Purdue University</i> , West Lafayette, IN	2023 - Present
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- GPA: 3.8/4.0

B.Sc. in Electrical Engineering <i>National Cheng Kung University</i> , Tainan, Taiwan	2020 - 2023
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- GPA: 4.0/4.3

EXPERIENCE

Applied Research Scientist Intern <i>Reality Defender</i> , Manhattan, New York (remote)	May '25 – Sep '25
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- Developed an in-context learning framework with large audio language models, achieving SOTA deepfake detection on in-the-wild speech (+54.9% avg Macro F1 improvement). **Natural Language Processing, RAG, ICL, Audio LLMs, and model routing.**

Graduate Research Assistant <i>Under Dr. Yung-Hsiang Lu</i> , <i>Purdue University</i> , West Lafayette, IN	Jan '24 – Present
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- Developed an AI tutoring model with 6x higher F1 than prior work, accepted to AAAI. **PyTorch, NLP, and Audio Transformers.**
- Leveraged **HPC clusters** and **Linux** environments to engineer generative pipelines for music mistakes, producing two datasets.
- Organized 'AI for Music' workshops at AAAI 2025, IEEE ICME 2025, and NeurIPS 2025, showcasing **leadership** and **communication**.

Startup Founder <i>LocalLens</i> , West Lafayette, IN	Mar '23 – Jan '24
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- Made an app for menu translation, currency conversion, and allergen alerts using **Flutter** and **Android Studio**.
- Built an MVP in 4 months with weekly sprints, emphasizing **leadership** and **collaboration**.
- Integrated Google ML Toolkit for cross-platform AI with **computer vision** and **real-time** deployment.

Research Assistant <i>Under Dr. Hsun-Ping Hsieh</i> , <i>National Cheng Kung University</i> , Taiwan	Mar '23 – Aug 2023
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- Raised cancer-screening invitation accuracy to 83% using **scikit-learn** and tree-based classification. **machine learning, statistics.**
- Elevated flash-chip yield by 17% with ensembling and Gaussian processes. **numpy, pandas.**

PROJECTS

Improving Developer Code Understanding with GitHub Issues and Retrieval-Augmented Generation <i>ChatGPT API, REST, Git</i>

- Built a RAG-based doc tool with GitHub issues; raised README clarity by 116% and code clarity by 16%.

Multi-Agent Self-Play for Beating Atari Games <i>OpenAI Gym, PettingZoo, PyTorch, RL, Multi-agent systems</i>
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- Used DQN/PPO self-play to improve Atari win rates by 11–32%.

Spectral Image Inpainting with Deep Learning <i>MATLAB, C++, CUDA</i>
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- Recovered 98% corrupted hyperspectral data at 0.02 RMSE using convex optimization and deep learning.

HONORS & AWARDS

- Outstanding Student Scholarship, awarded to top 2 students in NCKU-Purdue program (2020–2023)
- AAAI Student Scholarship (2025), Selected for NeurIPS Volunteer (2025)

PUBLICATIONS

- **B. Chou**, P. Jajal, N. J. Eliopoulos, J. C. Davis, G. K. Thiravathukal, K. Y.-J. Yun, Y.-H. Lu, "LadderSym: A Multimodal Interleaved Transformer for Music Practice Error Detection", *ICLR 2026* [\[Link\]](#)
- P. Jajal, N. J. Eliopoulos, **B. Chou**, G. K. Thiravathukal, J. C. Davis, Y. Lu, "AdaPerceiver: Transformers with Adaptive Width, Depth, and Tokens", *Under Submission* [\[Link\]](#)
- **B. Chou**, Y. Zhu, S. Koppisetti, "ICLAD: In-Context Learning with Comparison-Guidance for Audio Deepfake Detection", *Under Submission*
- P. Jajal, N. J. Eliopoulos, **B. Chou**, G. K. Thiravathukal, J. C. Davis, Y. Lu, "Inference-Time Alignment of Diffusion Models with Evolutionary Algorithms", *Under Submission* [\[Link\]](#)
- **B. Chou**, P. Jajal, N. J. Eliopoulos, T. Nadolsky, C.-Y. Yang, N. Ravi, J. C. Davis, K. Y.-J. Yun, Y. Lu, "Detecting Performance Errors with Transformers", *Accepted to AAAI 2025* [\[Link\]](#)
- P. Jajal, N. J. Eliopoulos, **B. Chou**, G. K. Thiravathukal, J. C. Davis, Y.-H. Lu, "Token Turing Machines are Efficient Vision Models", *WACV 2025* [\[Link\]](#)

PATENT PENDING

- System and Method for Detecting Musical Performance Errors, Patent Application 2025.
- ICLAD: In-Context Learning with Comparison-Guidance for Audio Deepfake Detection, Provisional Patent Application 2025.