TSENG, KWEI-WEN 曾奎紋

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EDUCATION

National Chiao Tung University — **Sep, 2013 – Jun, 2016**
Music Technology, Master of Science — **Hsinchu, Taiwan**

National Sun Yat-sen University — **Sep, 2009 – Jun, 2013**
Marine Biotechnology, Bachelor of Science — **Kaohsiung, Taiwan**

INDUSTRY EXPERIENCE

Waves Audio — **Aug, 2024 – Present**
Senior DSP Engineer — **Taipei, Taiwan**

- Designed a real-time source separation with low RAM usage and MCPS[A1], for karaoke applications, achieving 3.7/0.99 M parameters, 17/15 dB SI-SDR, and 406ms latency.
- Designed and implemented novel XTC algorithms[A2].
- Maintained immersive and spatial audio algorithms based on decomposed HRTFs and head tracking.

Li Auto — **Dec, 2021 – Jun, 2024**
Senior DSP Engineer — **Shanghai, China**

- Oversaw development of audio algorithms and a tuning tool.
- Ported algorithms from x86 to Hexagon DSP (8155/8295) and SHARC DSP (21569).
- Developed RoFormer source separation, Neural Reverberator[A3], and Upmixer[A4]; optimized via lookup tables, block processing, and SIMD intrinsics, reducing computational cost by **30%**.
- Conducted preliminary research on FxLMS-based active engine noise control algorithms, granular synthesis for engine sound design, and VBAP-based spatial audio.
- Provided mentorship to junior engineers.

Lava Music — **Jan, 2021 – Dec, 2021**
Senior DSP Engineer — **Guangzhou, China**

- Led audio algorithm and system development[A5] on SHARC DSP (21479).
- Developed AEC, CNN-based SED, time-varying FDN, PVOC, time-varying morphing filters, and synthesis algorithms (Karplus-Strong, FM); optimized via Taylor/Padé approximations, reducing cost by **40%**.

Tymphany Acoustic Technology — **Aug, 2019 – Jan, 2021**
DSP Engineer — **Taipei, Taiwan**

- Designed **Flow DSP**[A6], which were adopted by **Bose**, **Google**, **Jabra**, **LG**, **Marshall**, **NTT**, and **Rivian**.
- Implemented LMS Filter, Schroeder Reverberator, Linkwitz–Riley Filter.

Tymphany Acoustic Technology — **Sep, 2018 – Aug, 2019**
Electrical Engineer — **Taipei, Taiwan**

- Designed schematics, PCB layouts, and test fixtures; managed BOM.
- Developed an automated test and measurement platform using PyVISA.
- Developed a user-hardware interface using CPLD.

Positive Grid — **Oct, 2017 – Feb, 2018**
Junior Electrical Engineer — **Taipei, Taiwan**

- Designed schematics, PCB layouts, fixtures, and managed BOM; conducted failure sample analysis and hands-on troubleshooting.

PUBLICATIONS

- Kweiwen Tseng. "Building an Open Source Modular Synthesizer Based on the Integration of Raspberry Pi, Python and Pure Data". In: Workshop on Computer Music and Audio Technology, 2015

PATENTS

- Kweiwen Tseng. "Even Order Harmonic Compressor Using Pitch-Shifting, Full-Wave Rectifier and Amplitude Modulation". CN.202311220680.3. Sept. 2023
- Kweiwen Tseng. "Novel Audio Tuning Strategy Using Neural Network Stem Separation with VBAP and U-Net". CN.202311189701.X. Sept. 2023
- Kweiwen Tseng. "Surround Algorithm Based on Time-Domain Filterbank and Voltage Control Amplifier". CN.202311181121.6. Sept. 2023
- Kweiwen Tseng. "A HCI Interface and Spatial Room Model with Perceptual Acoustic Properties". CN.202311177268.8. Sept. 2023
- Kweiwen Tseng. "Novel Calibration Implementation Using Least-Squares IIR Filter on Mel-Scale". CN.202211612831.5. Dec. 2022

TEACHING ASSISTANT

- *Pure Data, VCV Rack, and Generative Music*, Music In Creation, Shanghai, 2023.
- *Introduction to Music Technology*, Music In Creation, Shanghai, 2022.
- *Performing Practice of Digital Orchestra*, NCTU, Hsinchu, 2014.
- *Computer Media: MSP*, NCTU, Hsinchu, 2013.
- *Real-time Digital Audio-visual Synthesis II*, NCTU, Hsinchu, 2013.

PRESENTATIONS

- *Neural Networks in Audio: Beyond Fancy Filters!*, IRCAM, Taipei, 2025.
- *Reverse Engineering 101: Buchla 700 as a Case Study*, IRCAM, Taipei, 2025.
- *The Theory and Implementation of Algorithmic Composition*, NTHU, Hsinchu, 2025.
- *From Design to Implementation: The Complete Guide to VST Development*, Digilog, Taipei, 2025.

GITHUB PROJECTS

- K700, a VST remake of the Buchla 700.
- REMORA, implementing audio processing and control interfaces on the SHARC DSP (21489).
- Puannhi, an asynchronous, time-variant feedback delay network for reverberation.
- Vermilliad, an open-source platform for building digital modular synthesizers. (Master's Thesis)

PRODUCTION & PUBLIC ADDRESS EXPERIENCE

- Zhao Lin –Pot Band Show, Mixing/Mastering, 2025.
- Morio Agata, Live Sound, Acoustic Guitar & Vocals, 2016.
- Lim Giong, Live Sound, DJ Set, 2016.
- Panai Kusui, Live Sound, Acoustic Guitar & Vocals, 2015.
- Ayugo Huang, Live Sound, Full Band, 2015.

SKILLSETS

- Programming: C, C++, LaTeX, Python.
- IDE: CCES, Jupyter Notebook, PyCharm, Visual Studio, Xcode.
- API and Framework: JUCE, PortAudio, PySide, VST SDK, WebAudio.
- Machine Learning: PyTorch, PyTorch-Lightning.
- Audio / Music Programming: AudioMulch, Max/MSP, Pure Data, SuperCollider, VCV Rack.
- Electrical Design: Altium Designer, EAGLE, LTSpice.