

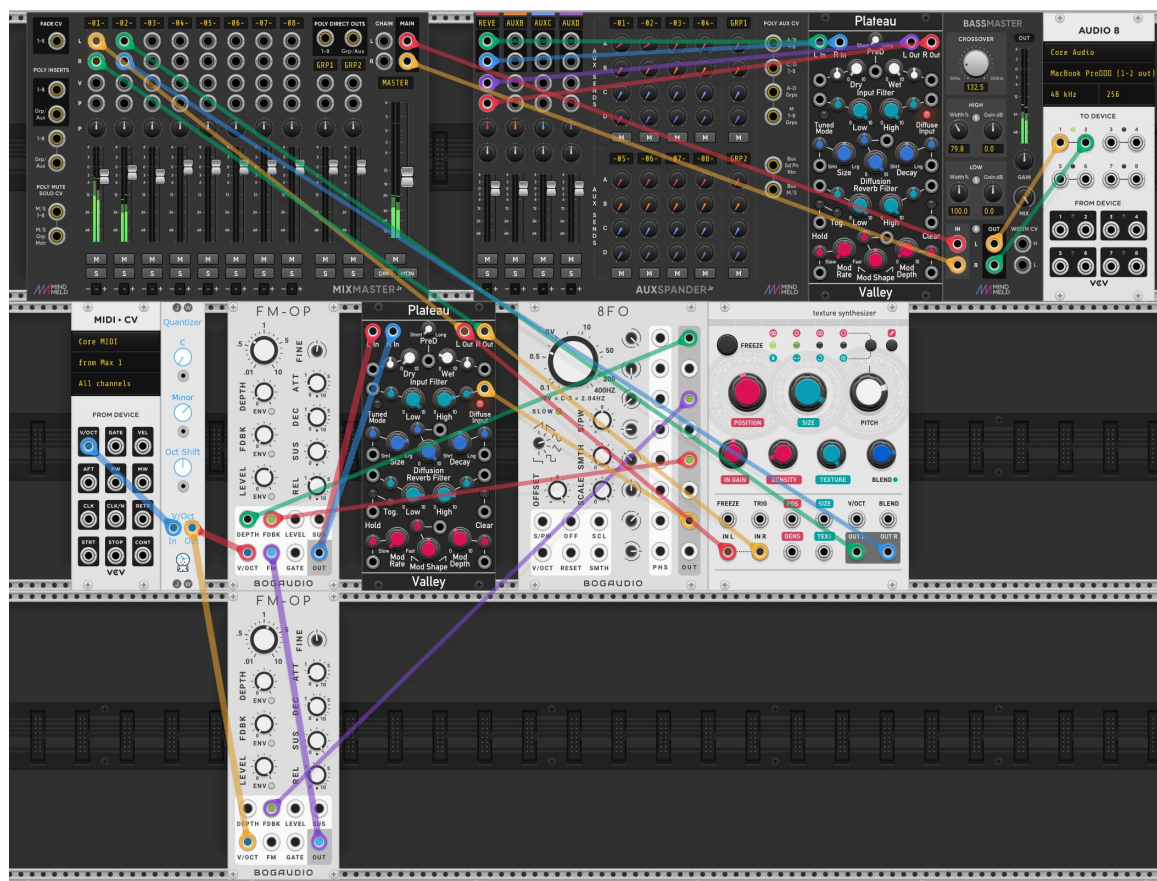
Pulse of the Pines – Introduction

This work is an experimental exploration at the intersection of sound, nature, and data-driven composition. It investigates how natural processes—tree growth, rainfall, and environmental textures—can be translated into sonic and visual forms, creating an immersive field where perception and materiality intersect.

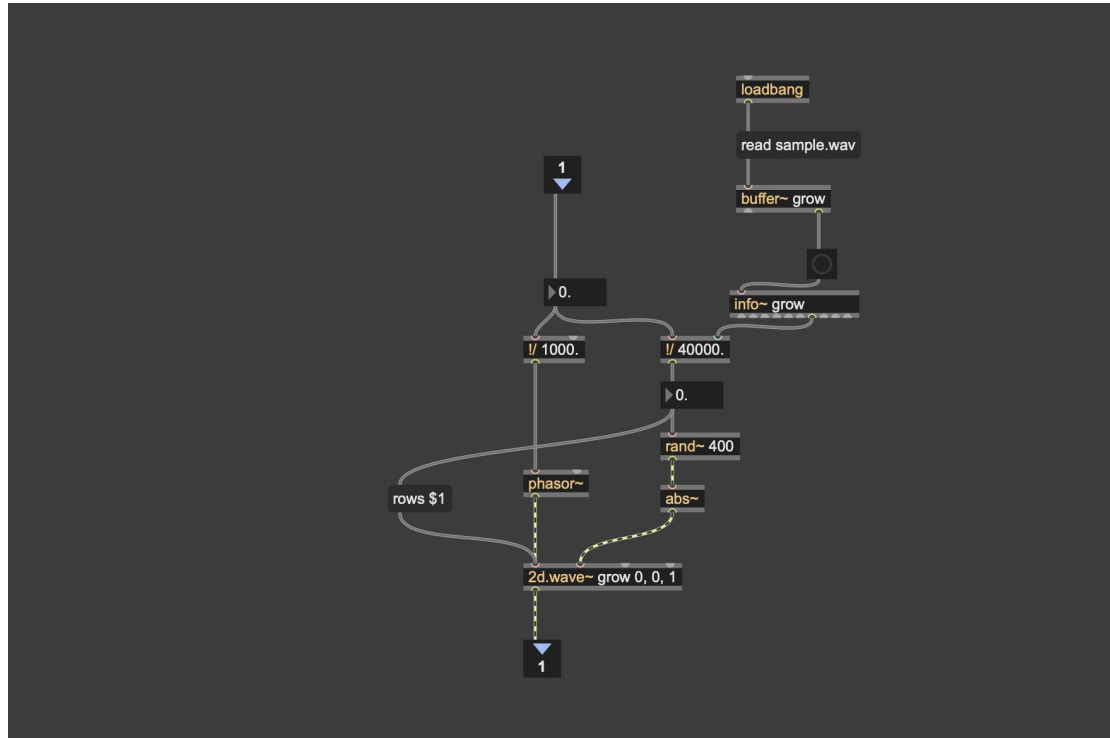
Technical Approach:

Raw recordings were captured using a **contact microphone** on tree trunks and a **Sennheiser MKH416**. The composition was realized primarily in **Max/MSP 9**, with modular synthesis in **VCV Rack 2**. The project consists of three main components:

1. Shepard Tone & MIDI Loop – An ascending Shepard Tone loop in Max/MSP produces the auditory illusion of continuous rise. Processed through FM-OP operator networks and polyphase LFO modulation in VCV Rack, this loop evolves into dynamic, textured ambient layers forming the foundational sonic environment.



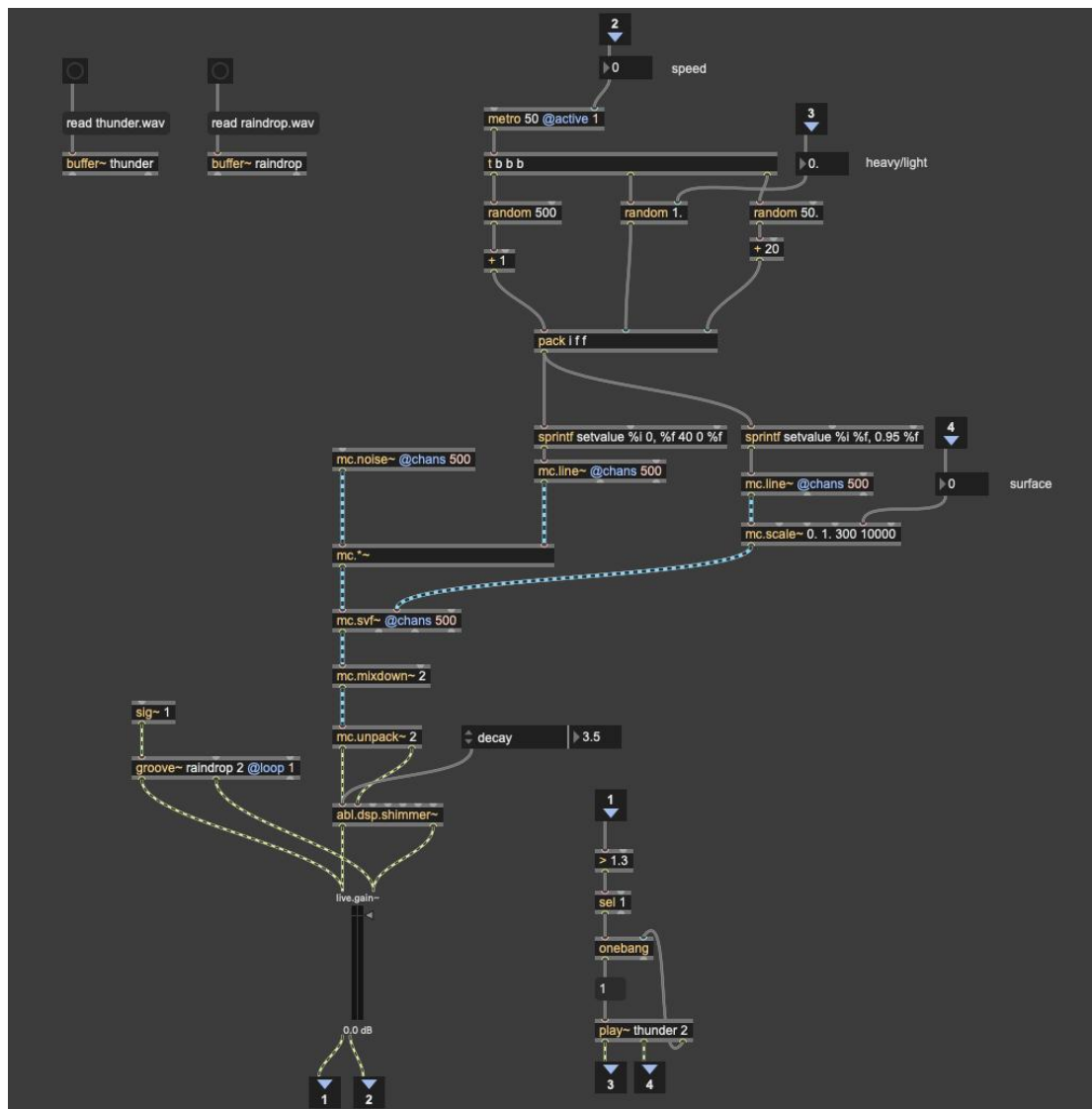
2. Data-Driven Sound Processing – I sourced Chinese pine growth data from the NOAA [1] database alongside historical rainfall records [2] from the Jingyuan meteorological station. The rainfall data was mapped onto the tree recordings captured with a contact microphone, then sliced into granular fragments to produce a shimmering, particulate texture—evoking the impression that the tree itself narrates its own temporality.



(Patch: granular-sample)

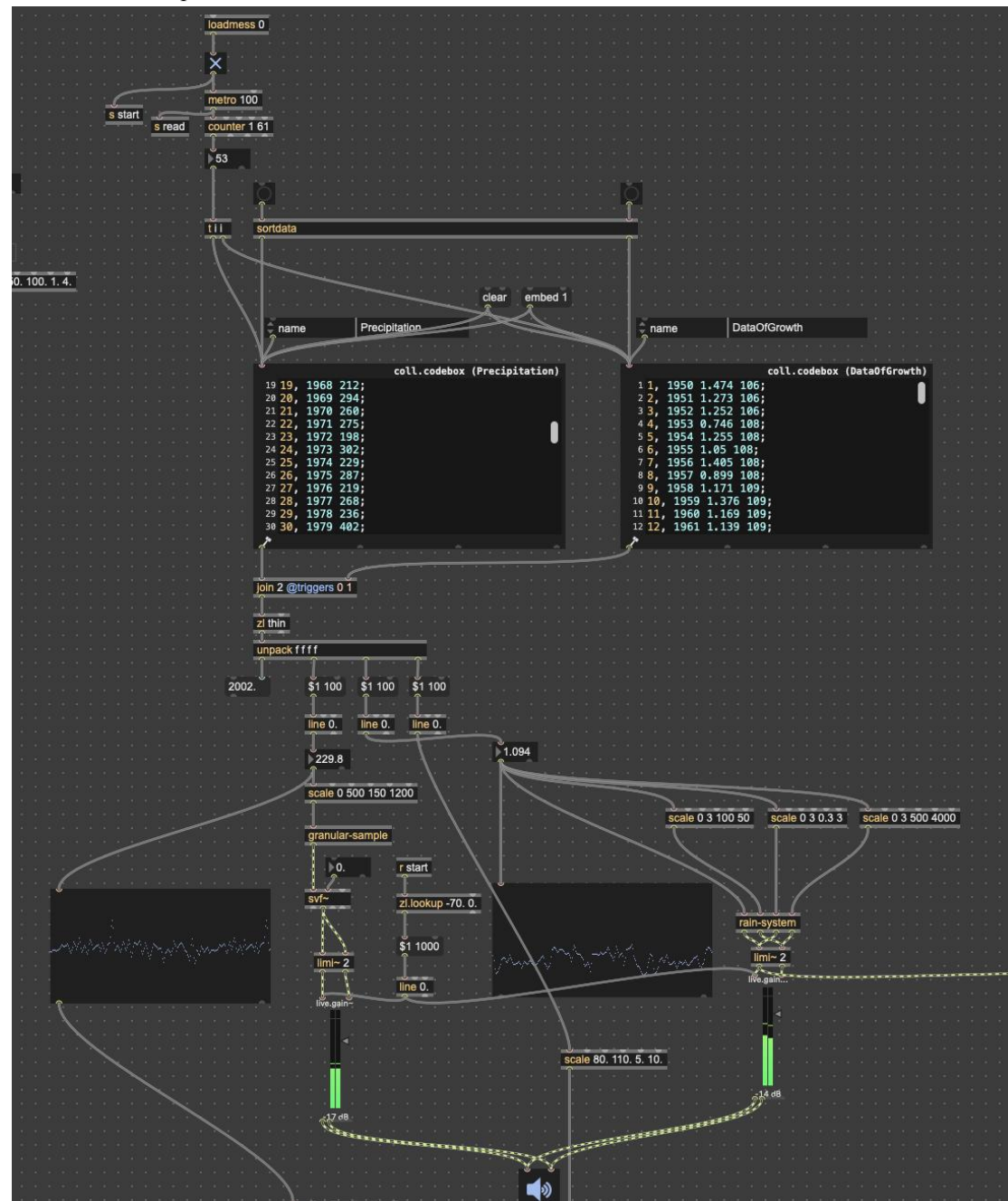
Simultaneously, the growth data controlled the restructuring of noise signals with added reverb, generating textures reminiscent of rainfall. Parameters such as intensity, speed, and spatial distribution were scaled directly by the dataset, aligning the simulated rain with the living rhythms of the tree.

To further enrich the sonic environment, I incorporated fire crackling into raindrop impacts, and triggered thunder strikes at data peaks. This approach created a dynamic interplay between subtle, detailed textures and sudden, impactful events, reinforcing the sense of an evolving, data-driven ecological soundscape.



(Patch: rain-system)

This is the main patch:



Artistic Significance:

This piece transforms natural phenomena into a hybrid sonic-visual experience, revealing patterns and rhythms imperceptible in everyday observation. It demonstrates the creative potential of combining environmental data, field recordings, and algorithmic processing to produce generative soundscapes. The work emphasizes a critical engagement with the materiality of sound, the temporality of ecological systems, and the role of technology in reframing human perception of nature.

[1] C. Qin et al., “Qin - Hasi Mountains, Jingyuan - PITB - ITRDB CHN094,” tree-ring standardized chronologies, NOAA National Centers for Environmental Information.

[Online]. Available: <https://www.ncei.noaa.gov/access/paleo-search/study/39725>

[2] 彭守璋. (2020). *中国 1km 分辨率逐月降水量数据集 (1901-2017) * [Data set]. 国家青藏高原科学数据中心.

[Online]. Available: <https://doi.org/10.5281/zenodo.3185722>