Audio Synthesis ML Accelerator

What's the goal?
- Eurorack hardware audio synthesis
- Control Voltage inputs, Sample output

What exists?
- WaveNet / nSynth
- Transformer models
- Parallel WaveGan

What are we doing differently?
- Real-time audio generation
- CV as conditioning input

What have we accomplished?
- Naive numpy benchmarking
- Main modules designed and verified
- Discarded FSM drafts

What's next?
- Simpler FSM for narrowed scope
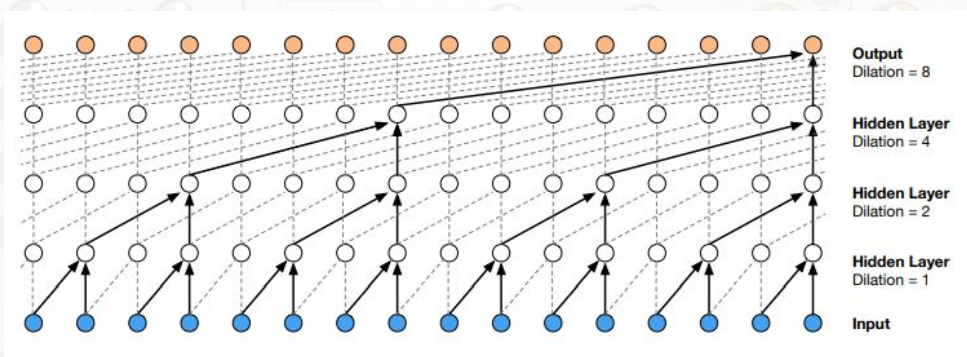- PCIe in cocotb for benchmarking
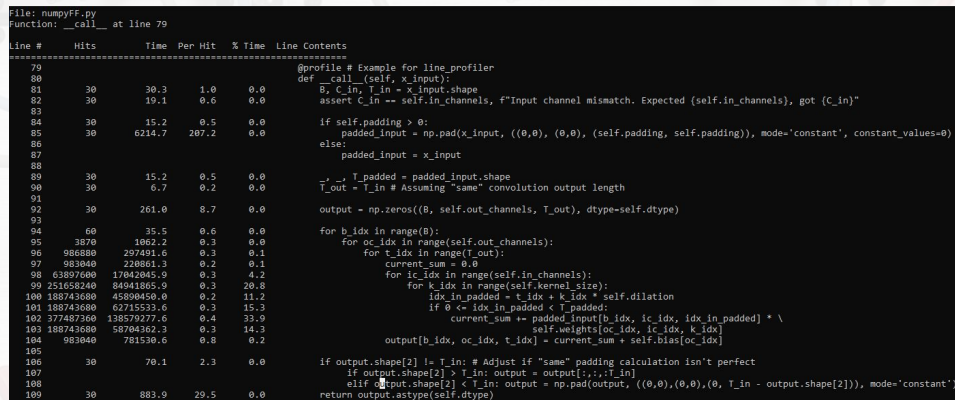- Discriminator for training (Future)

Figure 1: Dilated Causal Convolutional Network[1]

Figure 2: line_profiler results showing bottleneck

1. WaveNet: A Generative Model For Raw Audio, https://arxiv.org/pdf/1609.03499v2