



Aalto University
School of Electrical
Engineering

Computationally Efficient Hammond Organ Synthesis

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(Poster presentation by Julian Parker)

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Objective

Create a digital model of the famous Hammond organ



Image source:

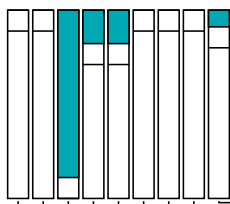
<http://www.cameratim.com/reviews/audio/hammond-123j3-organ/images/hammond-123j3-organ.jpeg>

Properties

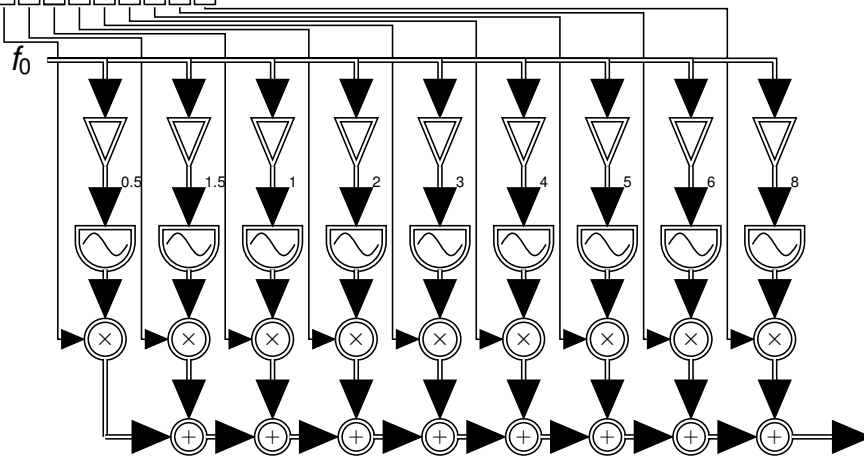
- Tone wheel synthesizer
- Timbre control via drawbars
- Leslie cabinet (rotating speaker units), important part of the sound!

Implementation

Organ Model



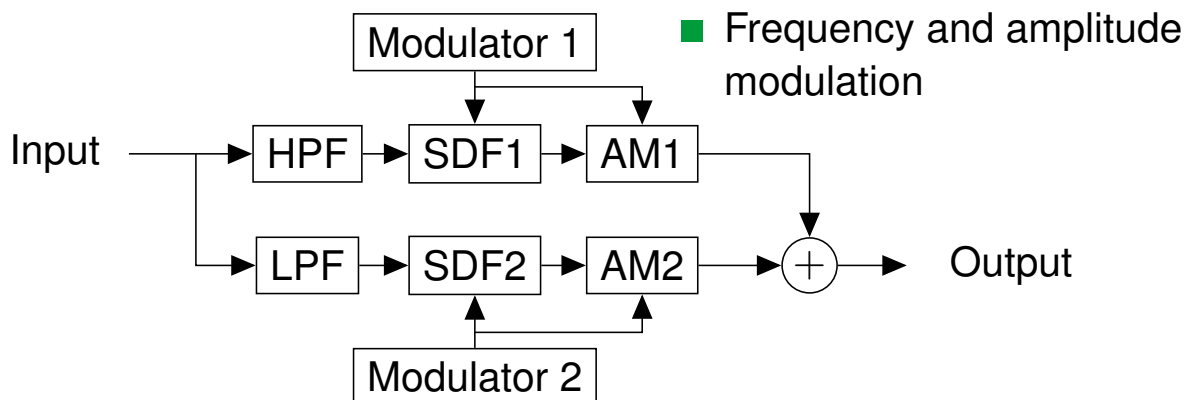
- Additive synthesizer (a few components)
- Components that are not heard not generated
⇒ Computational savings



“Key click” effect:
Emulated with
the sixth harmonic

Implementation

Leslie Cabinet Model



- Frequency modulation with short spectral delay filters (SDFs)

LIVE DEMO!