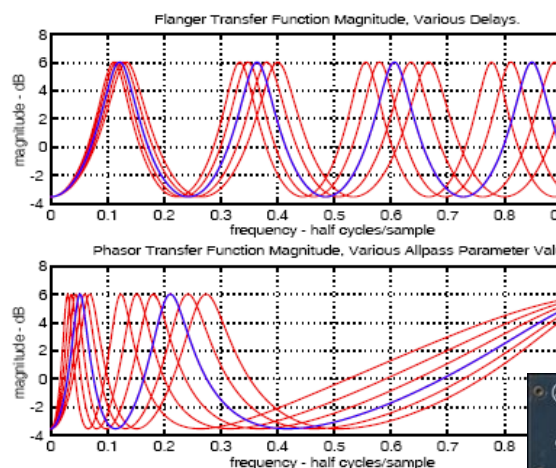
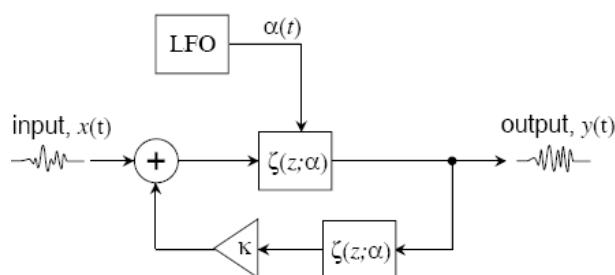


Music 424 / EE 367D

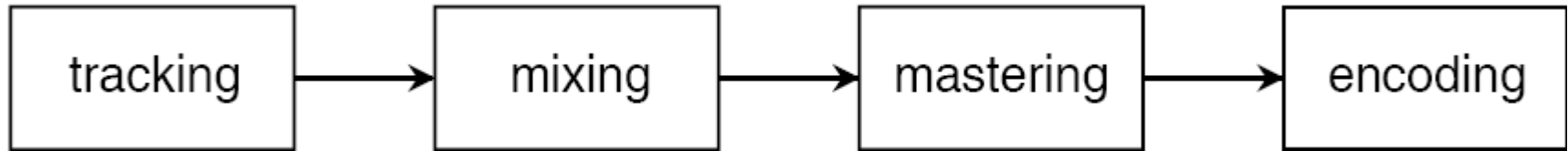
Signal Processing Techniques for Digital Audio Effects



Jonathan S. Abel
David P. Berners

TA: Doga Cavdir

Introduction



Audio Production Process

- Music is typically produced in four steps: tracking, mixing, mastering and encoding.
- This class is about how to build digital versions of the mainline effects used in mixing and mastering.
 - Dynamic range control
 - Reverberation and room acoustics
 - Equalization and filter design
 - Distortion and delay effects



Mixing and Mastering Effects

Chorus & Delay



Roland
Dimension D



Roland RE-201



BOSS CE-1

Equalizers



Helios Type 69 EQ



NEVE 1073 EQ



NEVE 1081 EQ



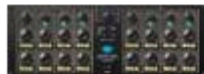
Cambridge EQ



Pultec EQP-1A



Pultec Pro



Precision EQ

Compressors & Limiters



Fairchild 670



NEVE 33609



1176SE



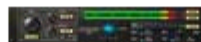
1176LN



LA-2A



Precision
Multiband



Precision Limiter

Reverbs



Plate 140



RealVerb Pro



DreamVerb

Guitar & Channel Strip



CS-1



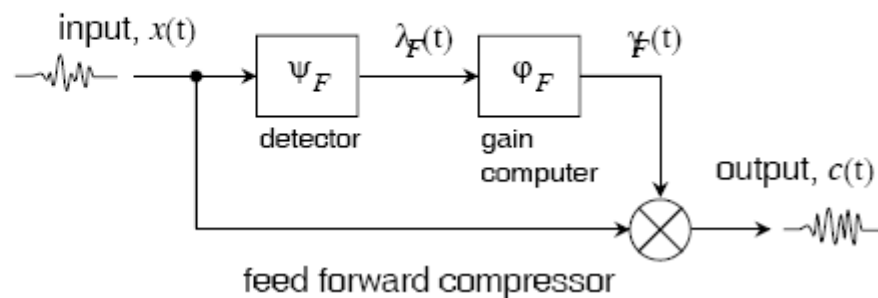
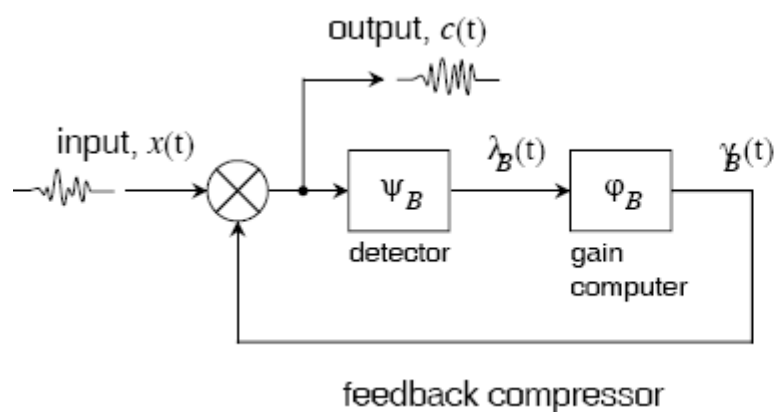
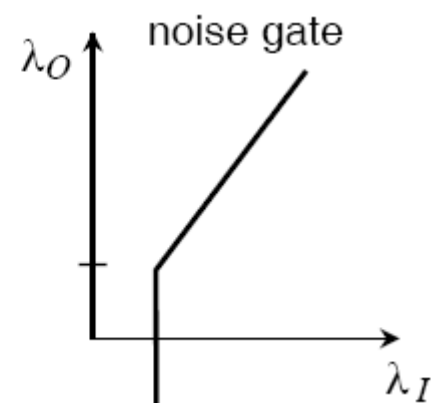
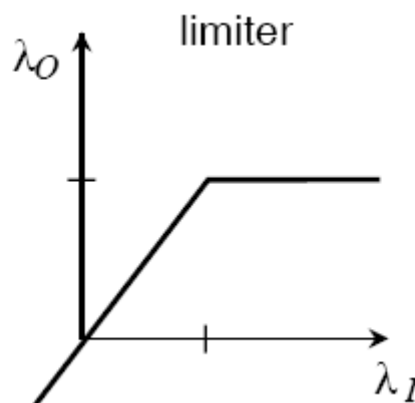
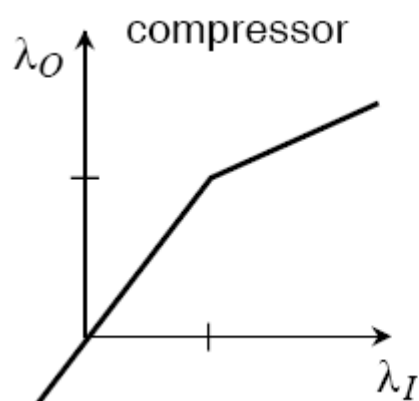
Nigel

Lecture Outline

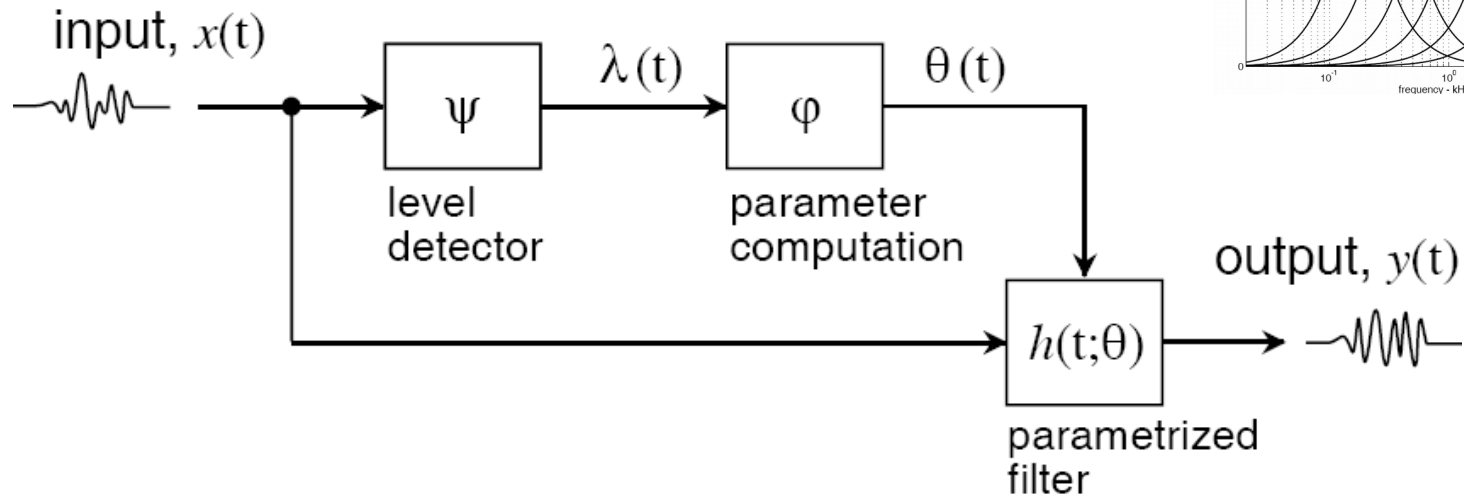
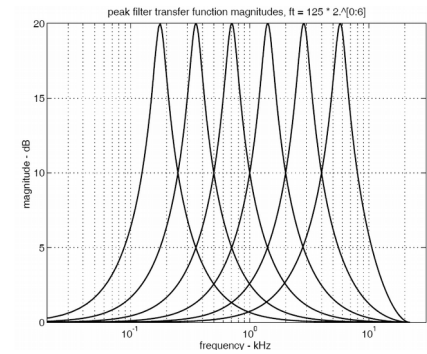
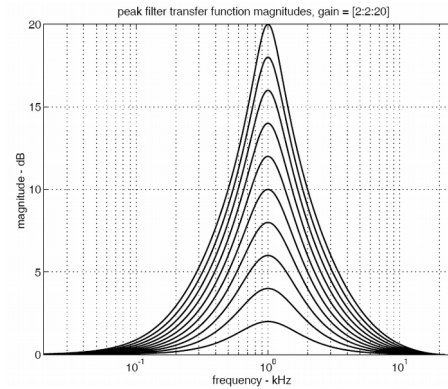
- Handouts
 - Course Information
 - Course Overview
 - Prerequisite Questionnaire
 - Class e-mail list
- Course Information
- Course Overview and Demo



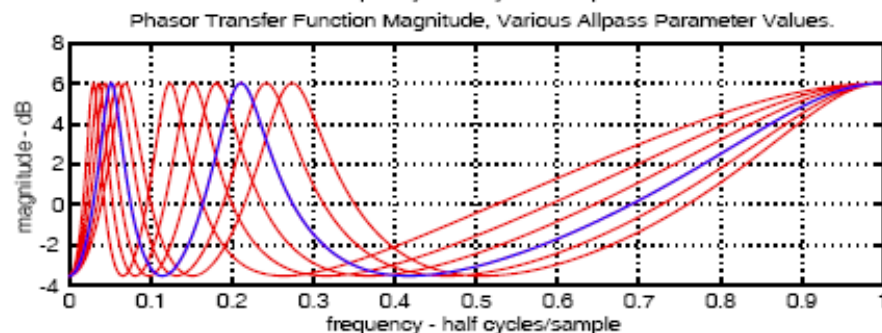
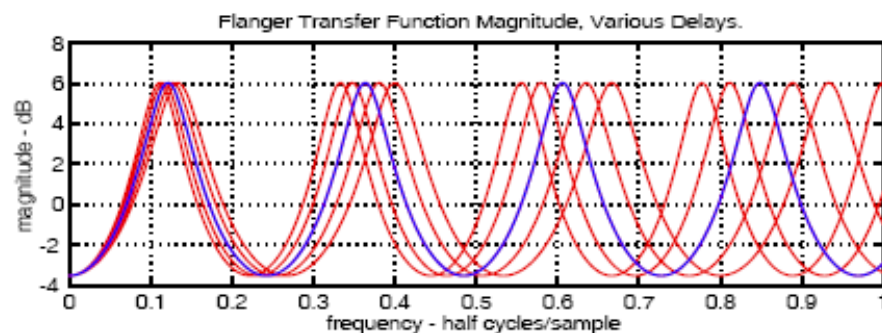
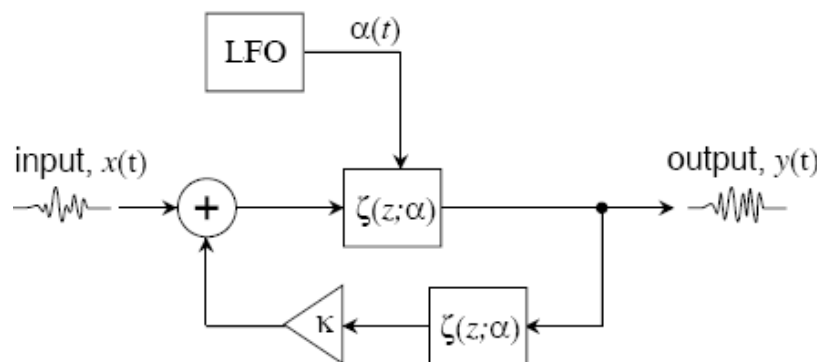
Dynamic Range Control



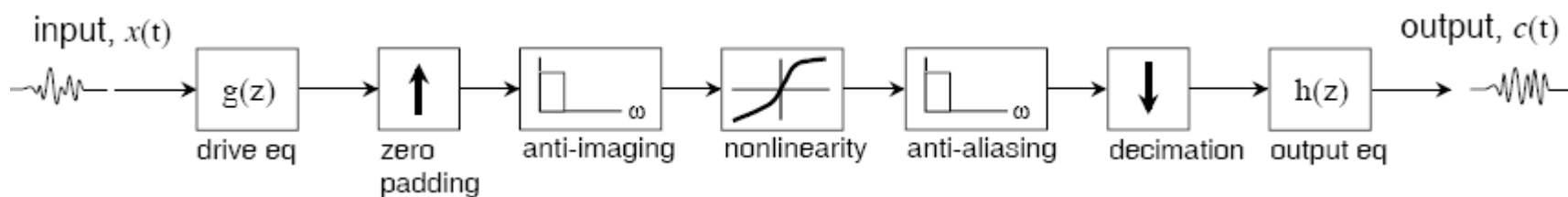
Equalization



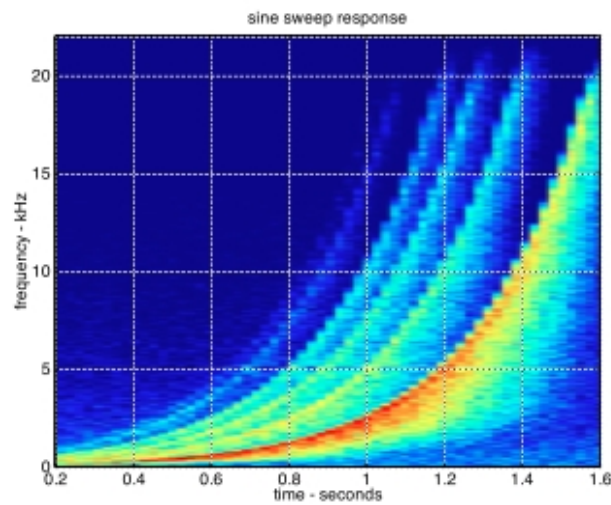
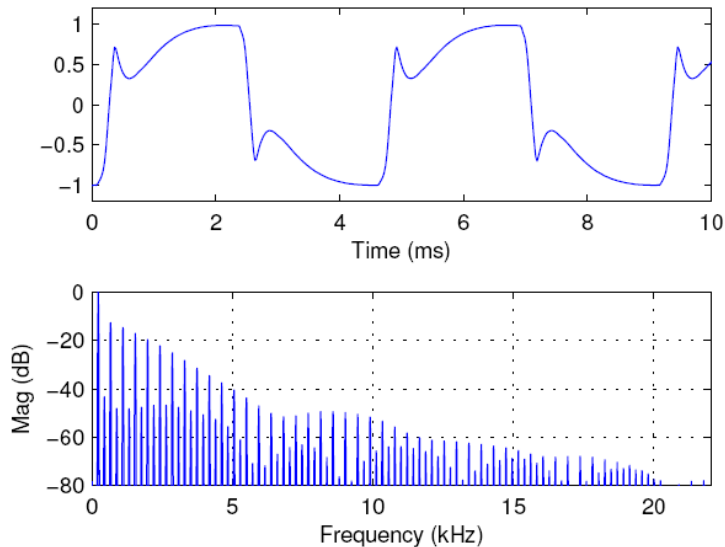
Delay Effects



Distortion Processing



$$r(t) = \sum_k g(t) * \left(\beta(\omega_k) \sin \int_0^t \omega_k(\tau) d\tau \right) \quad \omega_k(t) = k \times \omega(t)$$



Room Acoustics and Reverberation

