

Özgür Yazılım Dünyasında Müzik Uygulamaları

Mehmet Okonşar

Başında yabancılık çekildi...

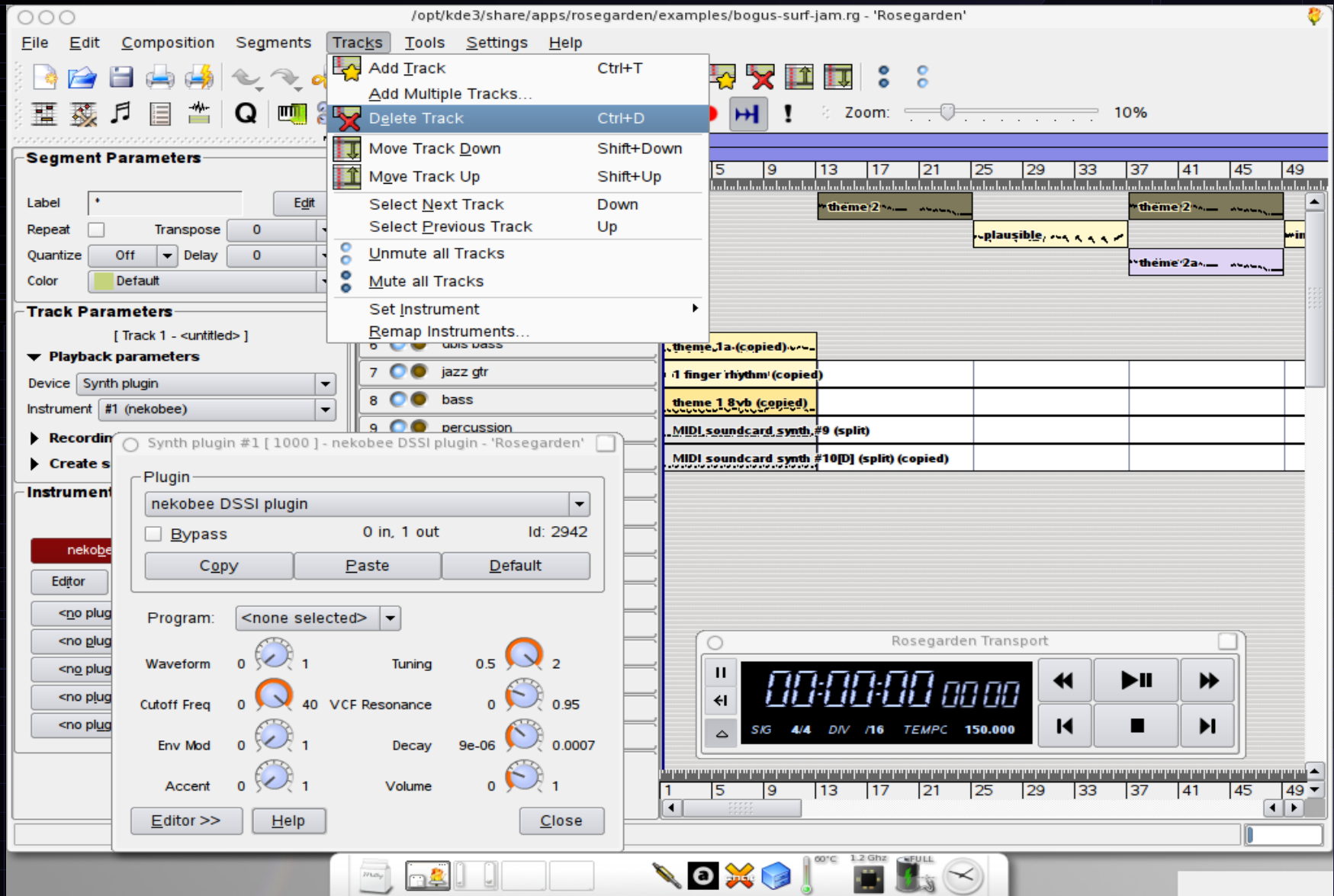
- Çok-kullanıcı ve çok işlevselli bir işletim sistemi müziğe yabancıdır
- Linux çekirdeğinin yüksek güvenliliği gerçek zamanlı müzik uygulamalarına uygun bir ortam olmamıştır
- Kapalı yazılımların çözümü: *direct X* ve *asio*
- Linux çekirdeğinin çoklu ortamlara uygun hazırlanması

Bileşik Çoklu Ortam Linux Sürümleri

(integrated multimedia Linux distributions)

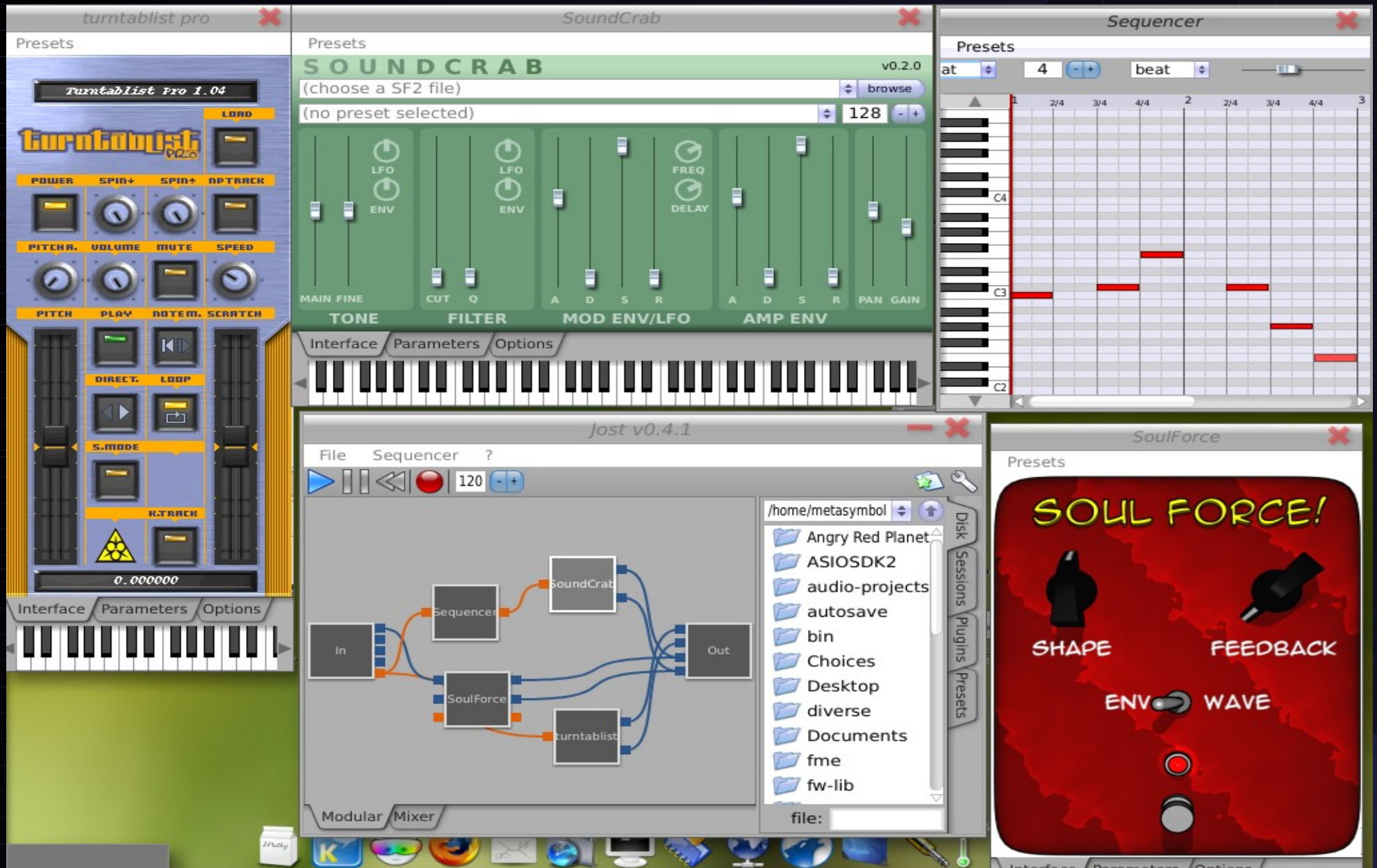
- **JackLab Audio Distribution** *JAD will be fully compatible with the recently released openSUSE 10.2. It will contain a full production environment for media production, primarily music. For this, the JackLab team added a Realtime Kernel version 2.6.19 to have fast audio processing with a latency up to 1.5ms. The default audio system will be based on the the Jack Audio Connection Kit (JACK) which is designed for the needs of musicians and producers and gives a professional audio/midi controlling interface.*
- **Musix GNU+Linux 1.0r6 / 2.0 Alpha 2** *based on Debian GNU/Linux and KNOPPIX.*
- **Ubuntu Studio**
- **DeMuDi (Agnula)**
- **Dynebolic**
- **64Studio**

Screenshots are fun..



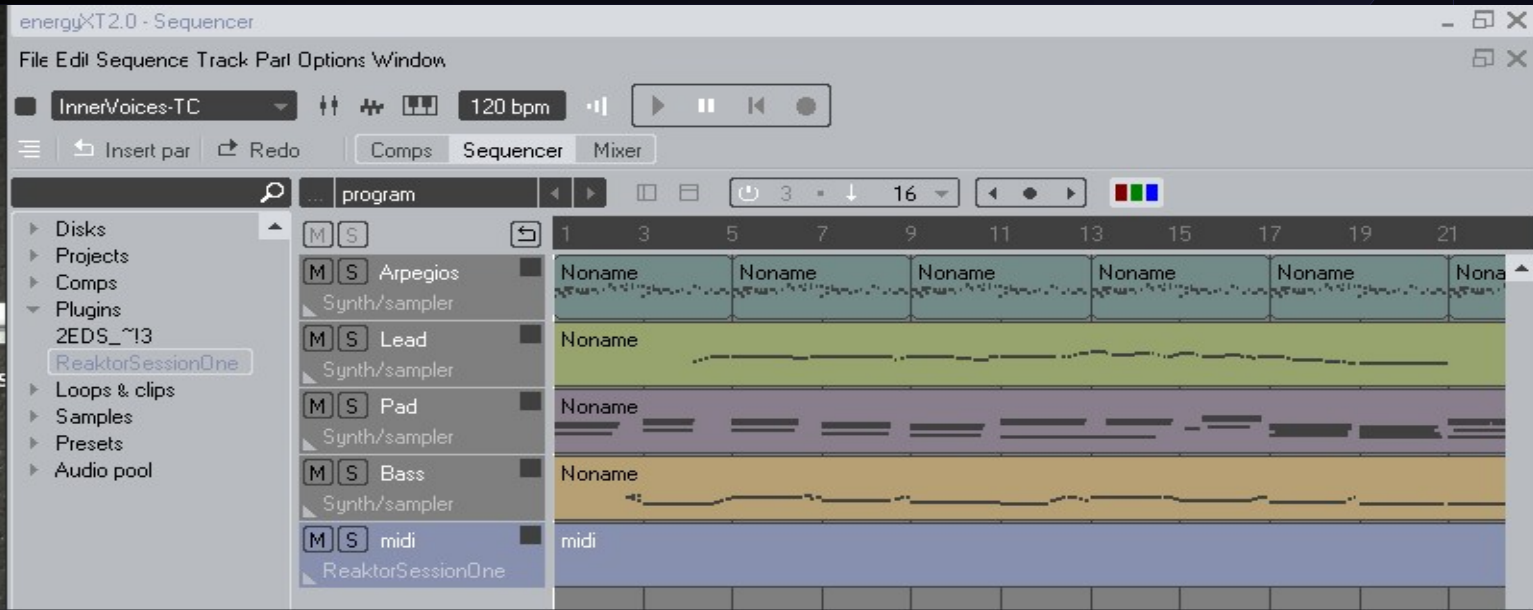
Rosegarden sequencer

Screenshots..



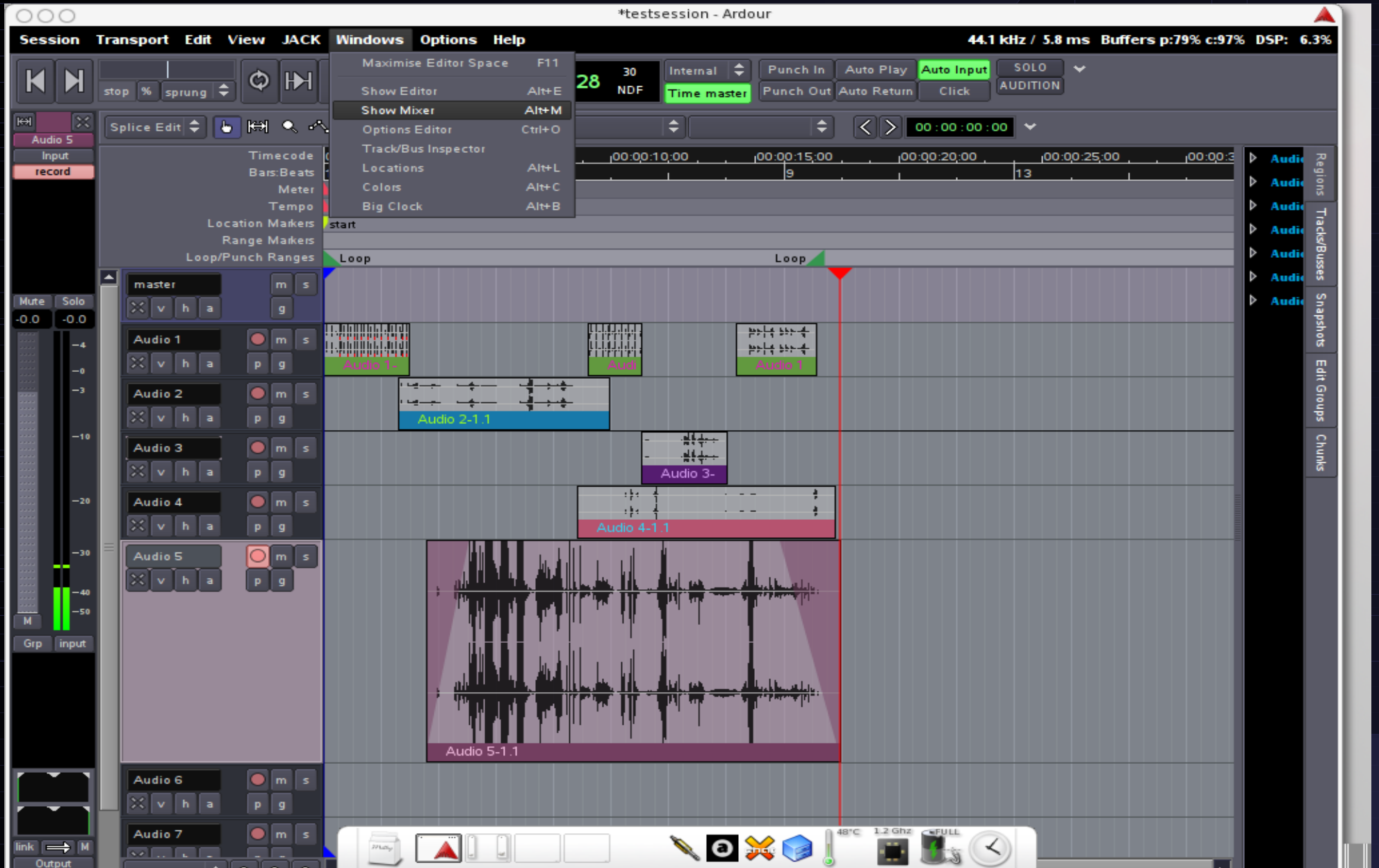
“Jost” JAD içinde vst kullanımı...

Screenshots..



Software Synth örneği..

Screenshots..



Ardour HDD kayıt uygulaması

Screenshots..

ardour: editor: [prueba-borrar2]

Session Edit JACK Windows SR: 48 kHz / 10,7 msecs Buffers p:94% c:58% DSP Load: 8,9% space: 01h:17m:58s

00:00:19:06 010 | 03 | 0809 48 120,00

1,0000 % sprung

editor mixer Edit: 00:00:00:00 Zoom Span 00:00:35:25 Zoom Focus Left Snap To None Snap Mode Normal Edit Mode Slide

Tracks master

Edit Groups * -all-

dbFS post -0,0 -3,8

6 0 -3 -10

master x v h a m s g

Audio 1 x v h a r m s p g

Audio 2 x v h a r m s p g

Audio 3 x v h a r m s p g

Audio 4 x v h a r m s p g

Audio 5 x v h a r m s p g

Musix xte... Mu... ~/.! JA... Co... ar... ar... 07:55 >

Aynı Ardour uygulaması
Musix dağıtımı içinde

Screenshots..

The screenshot displays the Jamin sequencer software interface. At the top, the window title is "jamin - default.jam - 0.95.0-rc2". The menu bar includes "File", "Edit", "Ports", and "Help". The status bar shows "Rolling | 27,9% CPU | 5 xruns | 2048 frames | 48000 Hz | RT". Below the menu bar is a transport control section with buttons for play, stop, and other functions, along with a time display of "00:05:21:70".

The main interface is divided into several sections:

- Input:** A vertical volume knob set to 0,0.
- EQ Section:** Includes "HDEQ", "30 band EQ", "Spectrum", and "Compressor curves" tabs. The "Spectrum" tab is active, showing a frequency spectrum with a blue line and a green bar. Below the spectrum are "EQ bypass" (unchecked), "Crossover" (00195), and "05811" settings.
- Band Settings:** Three frequency bands are defined: "Low : 25 - 195", "Mid : 195 - 5811", and "High : 5811 - 20000". Each band has five sliders (A, R, T, r, K, M) and a gain knob. The "Low" band gain is 1,00; the "Mid" band gain is 0,15; and the "High" band gain is -0,71. Each band has "Solo" and "Bypass" checkboxes.
- Compressor Section:** Includes "Boost" (Amount 3,3), "Limiter" (Input 6,0), "Limit" (0,0 dB), and "Release" (10 ms) settings. A "Limiter bypass" checkbox is also present.
- Output:** A vertical volume knob set to 0,0.

The interface features a "SOFTPEDIA" logo and website address in the top right corner. A small icon of a notepad is visible in the bottom right corner.

Jamin sequencer-synth bileşimi,
Musix içerisinde..

İşlenecek Uygulamalar:

- **Keykit** : gerçek zamanlı MIDI deneysel ortam
- Grafik Arayüz mü yoksa düz metin arayüz mü?
- **Lilypond** : nota yazımı
- **Csound** : elektronik müzik
- **Common Music** : algoritmik kompozisyon
- **GNU-Emacs**'ın bu yazılımlara arayüz olarak kullanılması

KEYKIT

- Temel kavramlar:
 - Gerçek zamanlı deneysel MIDI yaratıcılık ortamı
 - Ekran kullanımı (*WindowMaker* tarzında..)
 - Programlama dili
 - Sistemin içinde *Tools* ve kompozisyon ortamı geliştirilmesi:
 - ***GeoMaestro*** sistemi

Keykit

Keynote

On More Bang

Send a
'bang' msg

Add Del

On More Loop

expression
reverb depth
chorus depth
pan
volume

Bang
Chord Palette
Console
Echo
GM Prog Map
GM Control
Group
Kboom
Mouse Matrix
Riff
Tempo
Volume

More	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
major												
minor												
maj7	■											
min7												
sus												
dim												
aug												
maj9												
min9												

expression Controller Values

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

reverb d Controller Values

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

On More

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Bass Drum					■											
Ride Cymb																
Acoustic																

1 2 3 4 5

Arpeggio
Average ->
Chan Info
Copy
Dedup ->
Delete
Echo ->
Eventime
Flip
Fractal
Info ->
Legato

On More

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
bass	■															
rim shot																
snare																
hand clap																
low tom																
mid tom																
high tom																
closed hat																
open hat																
open hat2																
ride																
tambourine																
cowbell																
'co2d24v80c2																
'fo2d24v72c2																
'e-o2d24v78c																
'qo2d24v68c2																

Vo1

Tempo

REC off Snarf

Mouse Matrix

Redraw

Toggle Met

Stop All

Move
Resize
Delete
Tools ->
Misc ->
Page ->

Track View Edit B1: Aud Swe B2: Aud Pla

Merged Name: New # Tracks: 16

main riff S M Acoustic Grand 1

comp S M Clav 2

bells S M Celesta 4

key>
key>
key>
key>
key>
key>

http://nosuch.com/tjt/

Tim Thompson

MUSIC

[Prototypical](#)
[Only Takes a Second](#)
[Octave++](#)
[USENET Tapes](#)
[Woodstockhausen](#)
[26Mix](#)
[PLUM](#)
[MMML](#)
[Radio Free Quasar](#)

SOFTWARE

[KeyKit](#)
[KeyKit Notes](#)
[Midifile](#)
[Glib](#)
[Stevie](#)
[NthEvent](#)
[nosuch.vstutil](#)

HARDWARE

[LoopyCam](#)
[Finger Painting with Planets](#)
[Finger Fresco](#)
[Dancing Under the Stars of Lyra](#)
[Radio Free Quasar](#)

ONLINEWARE

[TUNE TOYS](#)
[Muse-O-Matic](#)
[Web Tones](#)
[Key Chain](#)
[Pieces-O-MIDI](#)
[MIDI Mixup](#)
[GIF Jam](#)
[Composer's Quarry](#)
[Espresso](#)
[Fresh Roast](#)
[Life Forms](#)





Who am I?

I'm a software engineer and artist. I worked at Bell Labs and AT&T for 20 years in New Jersey, and for Network Appliance in Silicon Valley for 9 years. I'm interested in programming languages, algorithmic composition, networked collaboration, atypical controllers, event-driven graphics generation, and realtime video processing. I've been inspired in recent years by something described in this quote by Lamie Fox:

"There is a yet unnamed art movement that may prove to be of some significance, and Burning Man is close to its center. It often manifests itself as circus, ritual, and spectacle. It is a movement away from a dialogue between an individual artist and a sophisticated audience, and towards collaboration amongst a big, wild, free and diverse community. It is a movement away from galleries, schools and other institutions and towards an art produced in and for casual groups of participants, more akin to clans and tribes, based on aesthetic affinities and bonds of friendship. It is a movement away from static gallery art and formal theater and towards site-specific, time-specific installation and performance. It is a rejection of spoon-fed corporate culture and an affirmation of the homemade, the idiosyncratic, the personal. It is profoundly democratic. It is radically inclusive, it is a difficult challenge, and it is beckoning."

What are people doing here?

In the last week, Tune Toys have been used 1559 times generated:

MIDI file	Tune Toy
	Muse-O-Matic
	Muse-O-Matic
	Muse-O-Matic
	Espresso

What have I been doing?

January, 2009

I did a solo performance of visual music at the Luggage Store Gallery in San Francisco as part of the [Music by the Eye](#) series. I combined my latest two systems, taking the graphical output of Galaxy (a keyboard-driven version of [Finger Painting with Planets](#)) and providing it as the video input to [LoopyCam](#). Two projectors showed the output of both systems simultaneously, side-by-side. Everything was driven from my playing on a MIDI keyboard. The performance was recorded - here's the youtube video.

January, 2009



I used a much-enhanced version of my [LoopyCam](#) with Heinz's new improvisational group [thishere](#). Here's what it looked like. Note that the loops no longer wrap around the quadrants. This version had up to 8 loops, and

- Etkileşimli web temelli yazılımlar..
- Görsel ve dokunsal arayüzler..

Özgür Yazılımda Yaklaşım Farkları



- Grafik Arayüz: İllüzyon?
- *Desktop-publishing* kandırmacası
- Kelime-işlemcilerde içerik ve tasarım çelişkisi (LaTeX)

Metin (*text*) Arayüzlerin Üstünlükleri

- Verimlilik (efficiency)
 - Hız
 - Ergonomi
- Yazılım ve donanım bağımsızlığı
 - Her platformda kullanılabilme
 - Donanım performansından bağımsız çalışabilme
- Güvenlilik ve dayanıklılık
 - *Data corruption* olasılığı yok (gibi)
 - Verilerin kurtarılması kolaylıkları
- Güncellenme ve taşıma kolaylıkları
 - Düz metin her zaman geriye kazanılabilen bir veri tipidir
 - Sayısal iletişim içerisinde en geçerli veri tipidir
- Kişiselleştirilebilme özellikleri
 - Kullanıcıya özgün ve en yüksek derece verimli bir çalışma ortamının kolaylıkla hazırlanabilmesi

Masaüstü Yayıncılık Aldatmacası, TeX ve LaTeX



- Yazarın işi: metnin mantıksal yapısı ve içeriği
- Tipografi ustasının işi: dizgi
- Yazar dizgi ustası değildir...

Masaüstü Yayıncılık Aldatmacasının Müziğe Uygulanması

- Bilgisayar ekranında müzik yazmak..
- Ergonomi sorunları
- Çözünürlük sorunları
- Sayfa düzenindeki olanaksız çözümlerin kullanıcıya dayatılması
- Müzik yazarken “seslendirilmesi”
 - Yazılı ve “sesli” müzik arasındaki temel farklar
 - İçerik ve biçim karmaşası

Lilypond ve diğerleri: *Finale-Sibelius...*

```
\begin[singleline]{lilypond}
seufzer = \notes {
  dis'8 e'8 }
\score {
  \notes {
    \seufzer \seufzer
  }
}
\end{lilypond}
\end{minipage}
\end{tabular}
}

\smallskip

LilyPond has no concept of part-extraction, because there is no
need for such a concept. Music fragments are assigned to identifiers,
and music is then either combined into a full orchestral score, or
used for creating the separate parts. Parts and scores are created
from the same input, so changes in that input are always applied
to both print-outs.
```

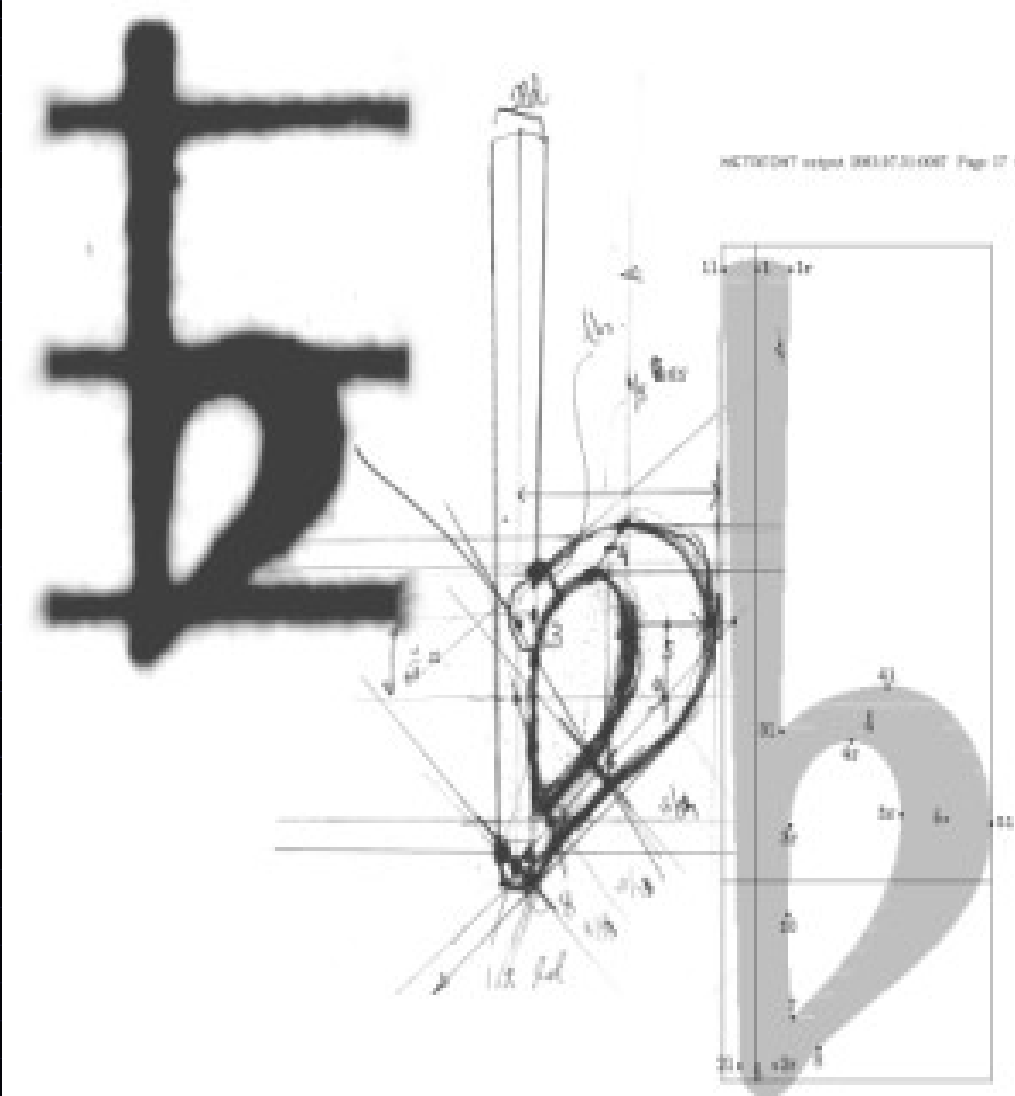
```
seufzer = \notes {
  dis'8 e'8 }
\score { \notes {
  \seufzer \seufzer
} }
```



LilyPond has no concept of part-extraction, because there is no need for such a concept. Music fragments are assigned to identifiers,

- Müzik dizgisi
- Besteci ve *notist (copyist)*

Bilgisayar ile Müzik Yazmak?



- Güncel müzik yayınlarının kalitesinin düşüklüğü
- Bu kalitesizliğin müzisyenlere etkileri:
 - nota okuma mesafesi
 - konsantrasyon sürekliliği...
 - “güzel” yazılmış bir belgeyle müzik yapma keyfi..

Bilgisayar ile Nota yazımı



- Eskiden nota nasıl yazılırdı...
- Bilgisayar ortaya çıkınca en oldu?

Karşılaştırma.

Geleneksel yöntemle yazılmış nota ve bilgisayar ile yazılmış nota:

Suite I
BWV 1007

PRÉLUDE



Prélude
BWV 1007



Yakından bakalım..

Nota başları aralıklara uygun olarak hafif yerleşim değişiklikleri göstermekte...

15

17

Ölçü çizgileri hep aynı yere gelmemekte..

Elle hazırlanmış... ↑

Bilgisayar ile hazırlanmış ↓

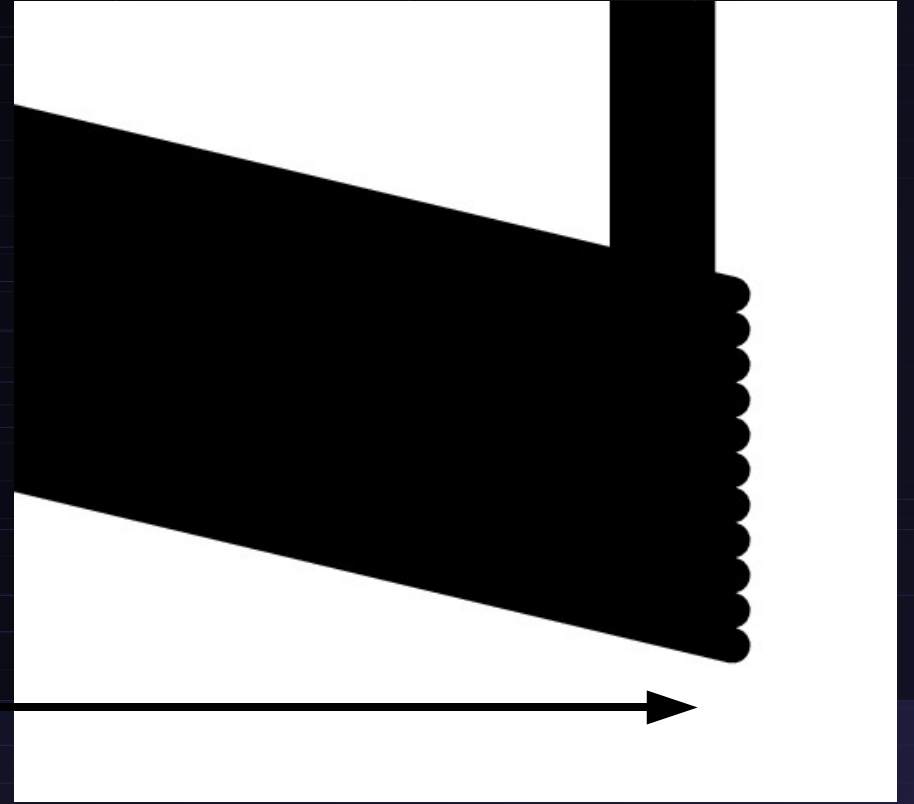
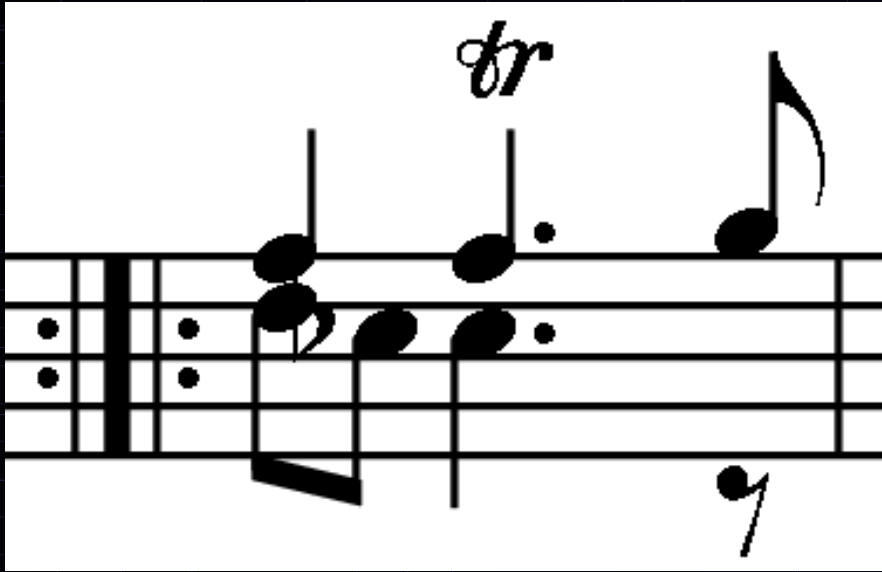
15

17

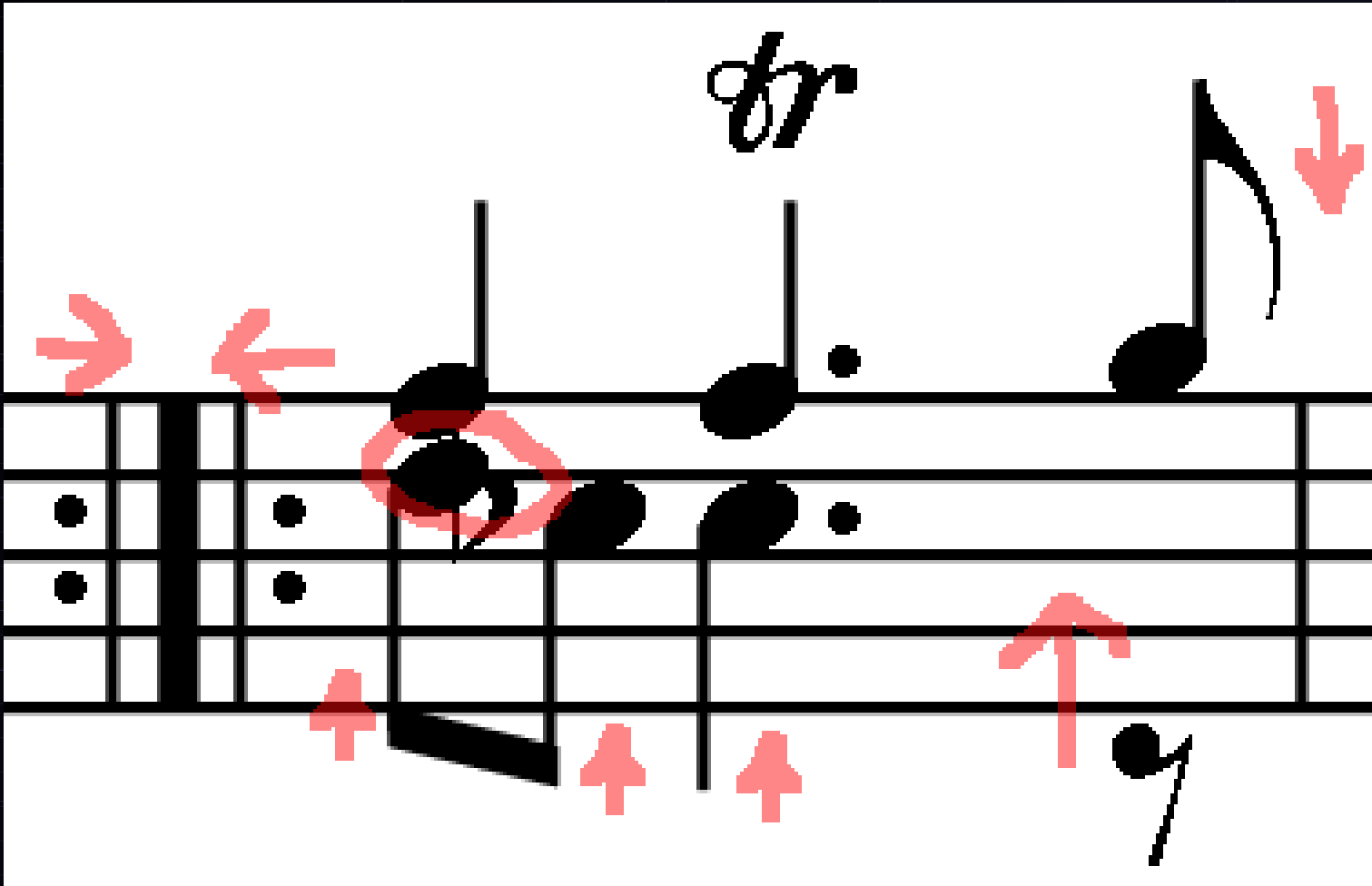
Finale (tm) ... :(nota yazım ve programlama yanlışları ...

The image displays a musical score for a piece titled "Finale (tm)". The score is written in bass clef and consists of four staves, numbered 12, 18, 23, and 27. The music is in a key with one flat (B-flat major or D minor). The notation includes various rhythmic values, accidentals, and articulation marks such as trills (tr) and slurs. A red arrow points to a double bar line with repeat dots at the beginning of the first staff (measure 12). A black arrow points to a trill mark above a note in the first staff (measure 15). Another black arrow points to a slur over a group of notes in the second staff (measure 21). A third black arrow points to a slur over a group of notes in the third staff (measure 25). A long black arrow at the bottom of the fourth staff (measure 27) points to the right, indicating the end of the piece. The score concludes with a double bar line and repeat dots.

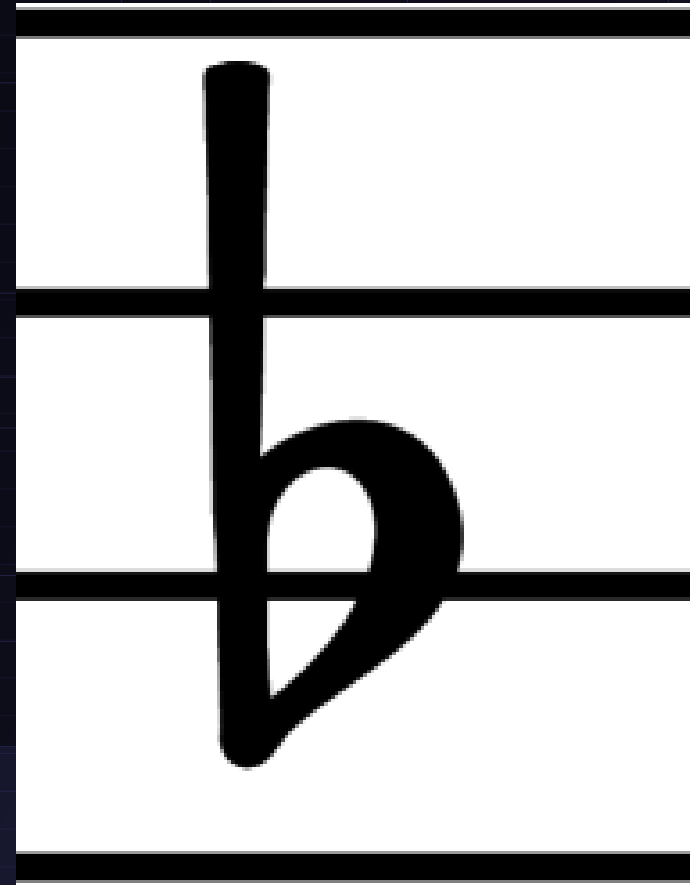
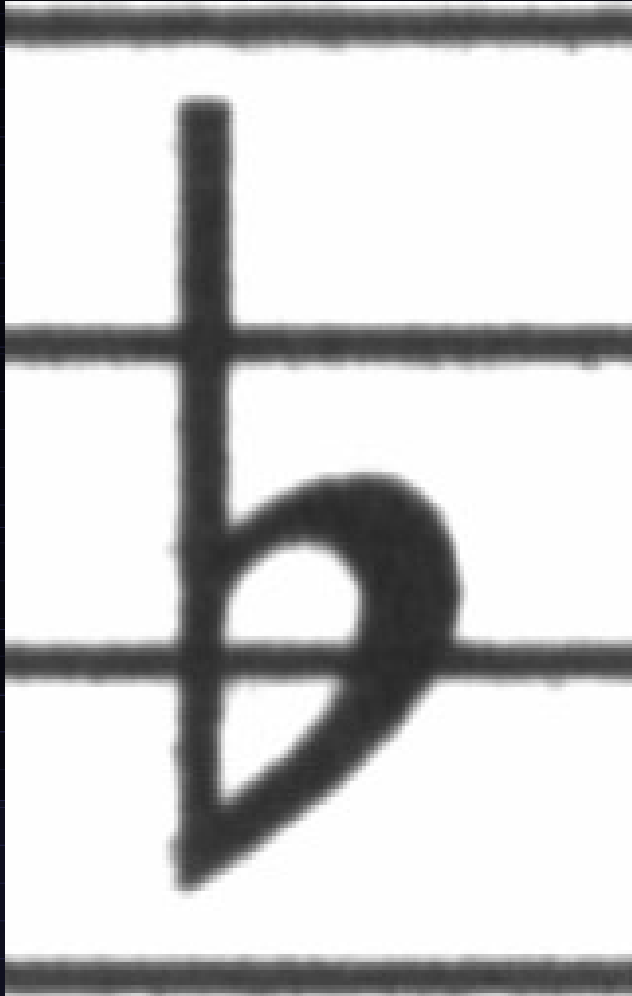
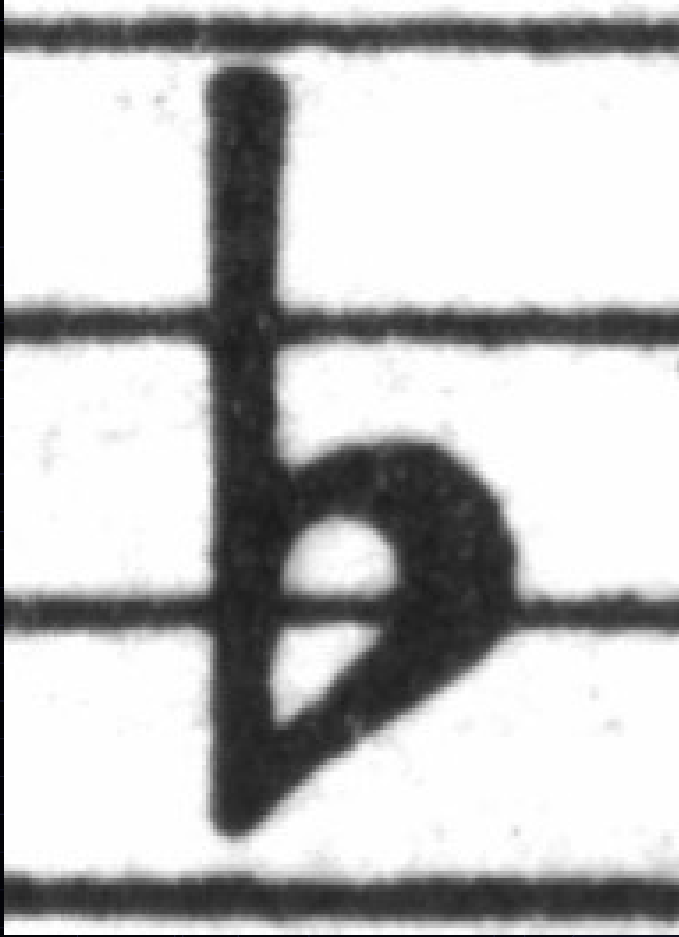
Yanlış Yazım Kılavuzu!



700\$'lık Yanlışlar



Herşey Ayrıntılarda..
1-bemol ..

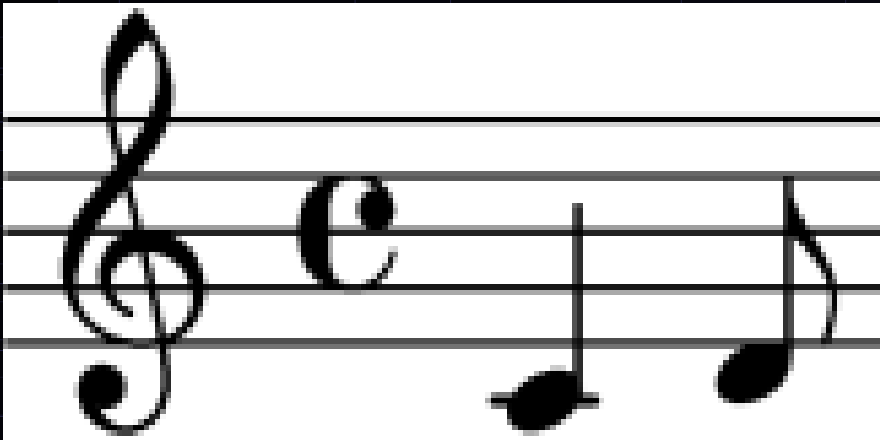


Lilypond

Temel Kavram

← { c'4 d'8 }

- 1. form
- 2. translation
- 3. content



Ayrıntılar..

2- Aralıklar:

Düzeltilmemiş aralık



A musical staff in treble clef with a common time signature 'C'. The staff contains a sequence of notes: a whole note on the second line (D4), a quarter note on the first space (E4), a quarter note on the second space (F4), a quarter note on the second line (D4), a quarter note on the first space (E4), a quarter note on the second space (F4), a quarter note on the second line (D4), and a quarter note on the first space (E4). Red arrows point to the intervals between the first and second notes (D4-E4), the second and third notes (E4-F4), and the third and fourth notes (F4-D4). The interval between E4 and F4 is a whole tone, while the others are half tones.

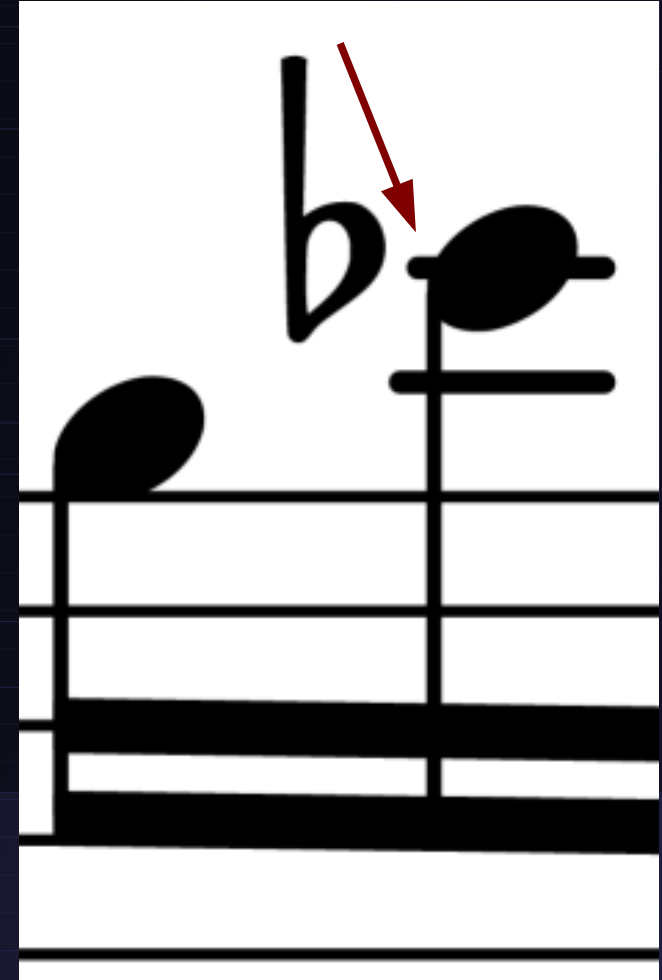
Düzeltilmiş aralık



A musical staff in treble clef with a common time signature 'C'. The staff contains a sequence of notes: a whole note on the second line (D4), a quarter note on the first space (E4), a quarter note on the second space (F4), a quarter note on the second line (D4), a quarter note on the first space (E4), a quarter note on the second space (F4), a quarter note on the second line (D4), and a quarter note on the first space (E4). Red arrows point to the intervals between the first and second notes (D4-E4) and the second and third notes (E4-F4). The interval between E4 and F4 is a whole tone, while the others are half tones.

Ayrıntılar

3-Ek çizgiler



Csound

Kökten Farklı bir Elektronik Müzik Yaklaşımı



- Düz metin girişi
- Kullanıcı tanımlı parametreler *pfields*
- Gerçek zamanlı ya da *rendering*
- Donanım ve platform bağımsızlığı
- Ve en önemlisi...

Elektronik Müziğin Temel Sorunu ve Csound

- Bir *partitürün* aksine, elektronik müzik soyut kavram ve yönergeler şeklinde ifade edilmez, gerçekleştirim sunulur
- Gerçekleştirim (*realization*) dönemin olanaklarına bağımlı kalır ve güncellenmez
- 50'li yıllarda gerçekleştirilen bir elektronik müzik parçası “eskimiş” duyulur ama 400 yıl önce bestelenmiş bir partitür bugün çalındığı zaman güncellik kazanır?
- Csound buna çözüm sunmaktadır..

Düz Metin Girdisi her Gerçekleřtirimde Güncellenir

- En yakın örnek 64bit'e geçiř zamanında olmuřtur
- Elektronik müzik Csound ile teknolojik kısıtlamalardan kurtulmuřtur

Csound'da Müziğin Metinsel İfadesinin Yararları ve Geleneksel *Partitür*'lerle Kıyaslanması

- Bilgiler analiz edilebilir
- Öğrenim, geliştirme ve güncellenme sağlanır
- Müziğin oluşumu, deneysel yanılma-düzeltilme uygulamalarından kurtularak daha kavramsal (*conceptual*) bir gelişim sağlar

Geleneksel *Partitür* ve Csound Kaynak Kod Kıyaslaması

7

50

1. Fl.
2.3. Fl.
1. Ob.
2.3. Ob.
1.in B.
Klar.
2.3.in B.
1. Fag.
2.3. Fag.
1.2.in F.
3.4.in F.
Hrn.
5.6.in F.
7.8.in B.
1.in F.
Tromp.
2.3.in F.
A.T.
Pos.
B.
K.-B.b.
Fk.
Viol.1
Viol.2

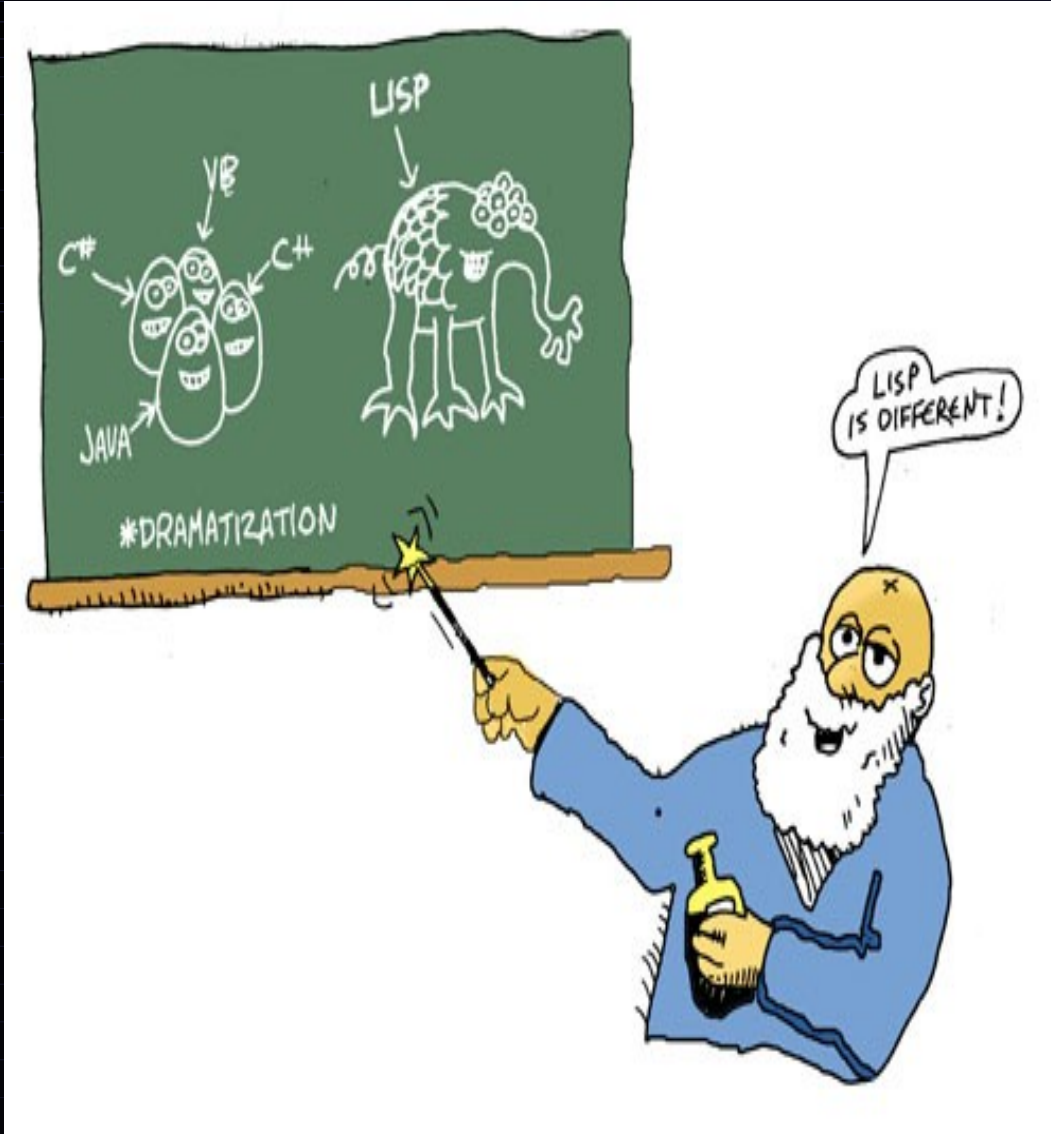
```
sr = 44100
kr = 4410
ksmps = 10
nchnls = 2
garvb   init    0
        instr   199; Global Reverb
idur    =       p3
irvbtim =       p4
ihiatn  =       p5
arvb    nreverb garvb, irvbtim, ihiatn
outs    arvb, arvb
garvb   =       0
        endin
        instr   143 ; Chatty Whales;
Modified Etude Patch
idur    =       p3
iamp    =       ampdb(p4)
ifrq1   =       cpspch(p5)
ifrq2   =       cpspch(p6)
itim1   =       p7
itim2   =       p8
ipnv1   =       p9
ipnv2   =      p10
irvbsnd =      p11
kenv    linen  iamp, .01, idur, .01
```

Common Music ve Algoritmik Kompozisyon



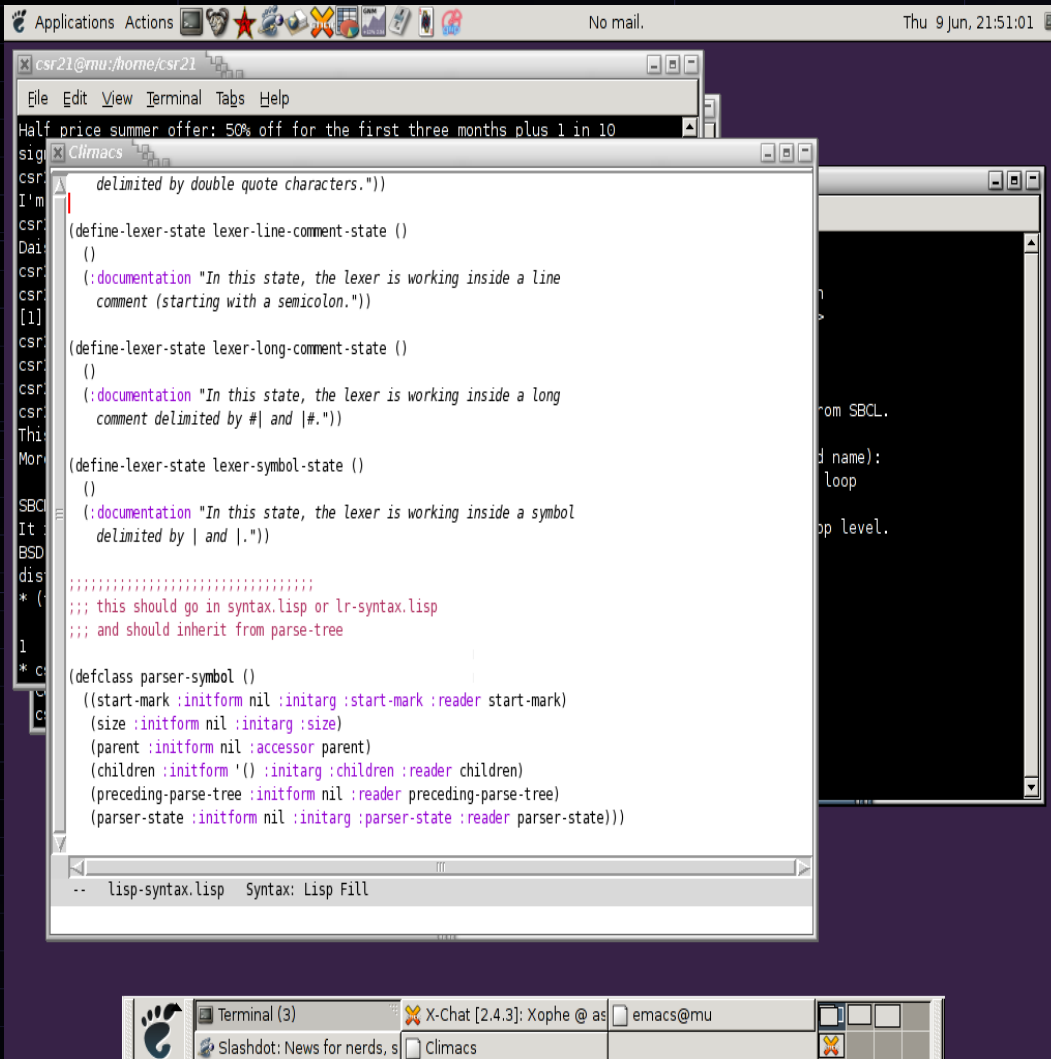
- Bestecilik esasen Algoritmiktir
- Algoritmik Bestecilik Tarihi 15.yy'a dayanır
- Grafik temelli uygulamalar
 - Amiga tabanlı
 - Windoze tabanlı
- Metin tabanlı uygulamaların üstünlükleri

LISP ve Algoritmik Bestecilik



- Bu işe en uygun programlama dili hangisidir?
- Müziğin veri yapısı ve *lisp*
- Kullanım kolaylıkları

Müzikal Verilerin Listeler Şeklinde İfadesi



```
delimited by double quote characters.")

(define-lexer-state lexer-line-comment-state ()
  (:documentation "In this state, the lexer is working inside a line
comment (starting with a semicolon.)"))

(define-lexer-state lexer-long-comment-state ()
  (:documentation "In this state, the lexer is working inside a long
comment delimited by #| and #|."))

(define-lexer-state lexer-symbol-state ()
  (:documentation "In this state, the lexer is working inside a symbol
delimited by | and |."))

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;;; this should go in syntax.lisp or lr-syntax.lisp
;;; and should inherit from parse-tree

(defclass parser-symbol ()
  ((start-mark :initform nil :initarg :start-mark :reader start-mark)
   (size :initform nil :initarg :size)
   (parent :initform nil :accessor parent)
   (children :initform '() :initarg :children :reader children)
   (preceding-parse-tree :initform nil :reader preceding-parse-tree)
   (parser-state :initform nil :initarg :parser-state :reader parser-state)))

-- lisp-syntax.lisp  Syntax: Lisp Fill
```

- '(c e g b c) bir “motif”?
- (:pitch 'c4 :dur 4)
property list
- (define pat1 (new
cycle :of '(a b c d)))

Common Music Girdi ve Çıktıları

```
cm> (events (list (duet-cmn 0 12 '(c3 d ef f
g))
(duet-cmn 1 12 '(c5 d ef f
g)))
```

"duet.eps"

```
:staffing duet-staves
```

```
:size 24
```

```
:title "Hiho!")
```

Manuscripting duet.eps...

"duet.eps"

```
cm> (events (list (duet-cmn 0 12 '(c3 d ef f
g))
```

```
(duet-cmn 1 12 '(c5 d ef f
g)))
```

"duet.cmn"

```
:staffing duet-staves
```

```
:size 24
```

```
:title "Hiho!")
```

"duet.cmn"

Hiho!

The image shows a musical score for a piece titled "Hiho!". It consists of two staves. The top staff, labeled "staff-1", is in treble clef and contains a melodic line with notes G4, A4, Bb4, C5, D5, E5, F5, G5, A5, Bb5, C6, D6, E6, F6, G6. The bottom staff, labeled "Viola", is in bass clef and contains a bass line with notes G2, A2, Bb2, C3, D3, E3, F3, G3, A3, Bb3, C4, D4, E4, F4, G4. The time signature is 4/4. The score is presented in a clean, black-and-white format on a white background.

Kaynakça

- <http://lilypond.org/>
- <http://commonmusic.sourceforge.net/>
- <http://csounds.com/>
- <http://ccrma.stanford.edu/software/cmn/cmn/cmn.html>
- <http://www.okonsar.com>

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