

# Live Performance, the Interactive Computer and the Violectra

Dr Sam Hayden / Dr Mieko Kanno

Durham University



Fig. 1:  
*Violectra* electric violin

---



# Fig. 2: *schismatics* (2007, rev. 2010) for electric violin and computer: opening of movement I

***schismatics***  
for solo electric violin and live electronics

Sam Hayden (2007)

♩ = 43

Scordatura:  
E  
A 1/4♯  
D  
G 1/4♯

**Violectra (fingered)**

**(Sounding)**

col legno - jeté (damp strings)

III arco sul pont. flautando sul tasto

III sul pont.

gliss.

gliss.

molto sul pont. (scrape)

III II

7

5:4

**fff**

**ffpp**

**ff**

**fff**

**ffpp**

**ff**

7

5:4

**fff**

**ffpp**

**ff**

# Fig. 3: *schismatics* (2007, rev. 2010) for electric violin and computer: symmetrical structure

---

**I**

**quaver = 43**

**2'54"**

col legno / jeté / scrape / flautando

**VII**

**quaver = 47**

**3'55"**

flautando / spicc./  
hammer-on

**II**

**quaver = 53**

**2'18"**

pizz. / arco / flautando / hammer-on

**VI**

**quaver = 59**

**2'10"**

pizz. / arco / gliss.

**III**

**quaver = 61**

**1'04"**

scrape / tremolo

**V**

**quaver = 67**

**0'45"**

tremolo / gliss.

**IV**

**quaver = 71**

**0'31"**

jeté / col legno

## Fig. 4:

### 3<sup>rd</sup> party sound analysis Max external objects added to the *schismatics* (2010) Max/MSP patch

---

- ◉ **analyzer~** (Tristan Jehan's analysis object outputs multiple perceptual features). Noisiness estimator (spectral flatness): 'noisiness':  
0 = pure (sine) / 1 = noise (white).
- ◉ **yin~** (IRCAM Real Time Musical Interactions) outputs fundamental pitch estimation, signal amplitude and a periodicity or 'quality' factor:  
1 = pure (sine) / 0 = noise (white).
- ◉ **envfol1~** (Envelope Follower from IRCAM *Jimmies* Library).
- ◉ **ll~** (Nick Collins' 'on the fly' machine listening and learning system; extracts features of input sounds, e.g. frequency content of spectrum, energy, brightness, noisiness, onsets etc., and discovers timbral clusters).
- ◉ **Onset detection** (via bonk~, timer & coll) for capture of temporal information (rhythm recorder). Records delta-times between live e-violin attacks, recalled in sequence as rhythmic series.

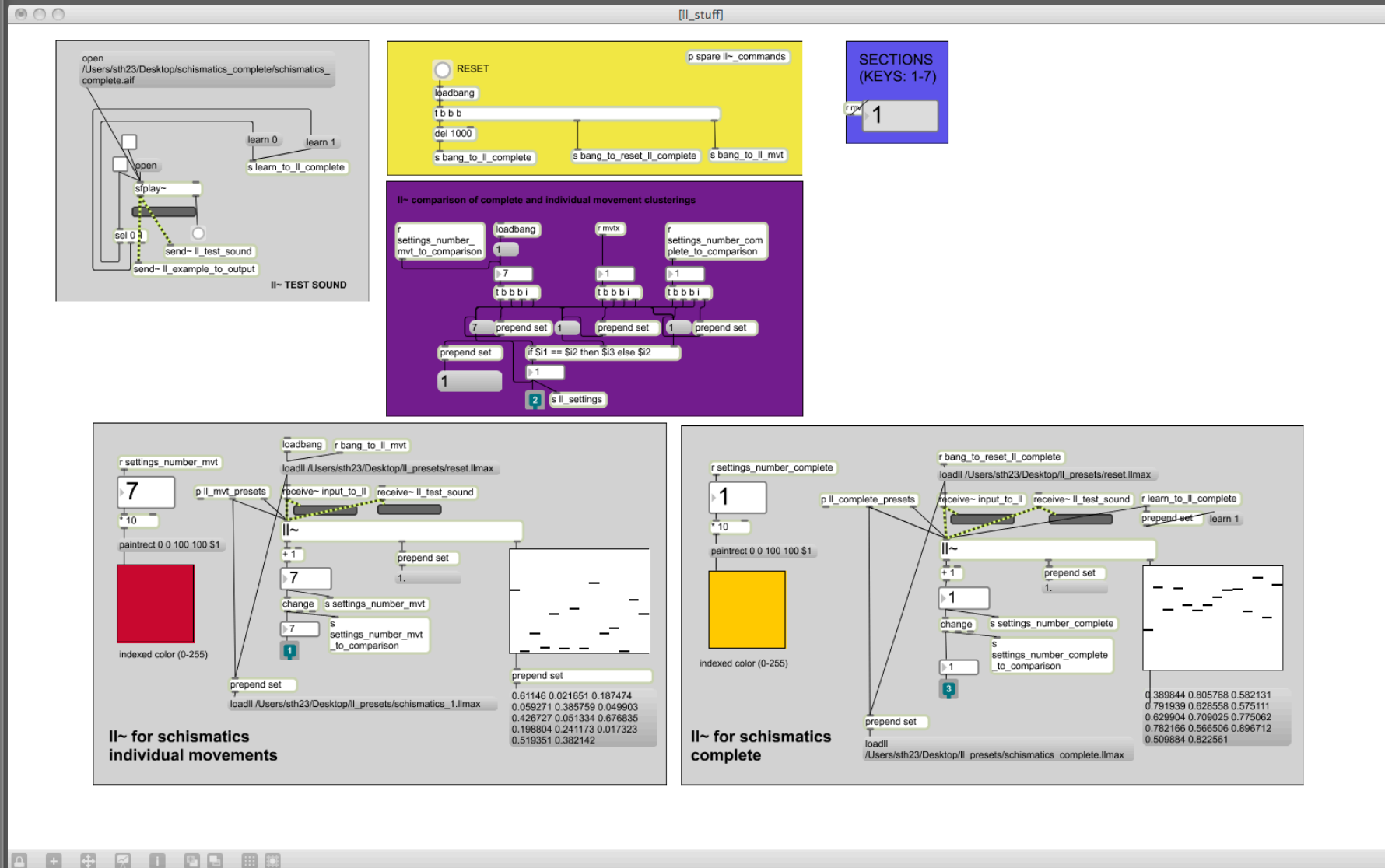
## Fig. 5:

### References for 3<sup>rd</sup> party Max/MSP externals:

---

- ◉ Collins, N. (2010). ll~, for Mac OSX, Max 5. Listening and Learning system for Max/MSP. <http://www.cogs.susx.ac.uk/users/nc81/code.html#Max>
- ◉ Jehan, T. (2008). analyzer~, version 1.4.1 for Mac OSX UB (Max/MSP external object). <http://web.media.mit.edu/~tristan/maxmsp.html>
- ◉ Schell, N. (2007). IRCAM IMTR-Analyse library. yin~  
The module implements the YIN algorithm by Cheveigné and Kawahara outputting a fundamental pitch estimation, a periodicity factor and the signal energy.  
[http://imtr.ircam.fr/imtr/Max/MSP\\_externals](http://imtr.ircam.fr/imtr/Max/MSP_externals)  
<http://forumnet.ircam.fr/>
- ◉ Settel, Z. (1994-98). IRCAM *Jimmies* library: envfol1~ / fshift1~ etc.  
The *Jimmies* library is an historical collection of patches, abstractions and external objects developed for the MAX/FTS environment on the ISPW at the beginning of the 1990s, and assembled into a formal collection of tools by Zack Settel in 1993.  
[http://www.maxobjects.com/?v=libraries&id\\_library=59&id\\_platform=0&start=0](http://www.maxobjects.com/?v=libraries&id_library=59&id_platform=0&start=0)

Fig. 6:  
 $ll \sim$  subpatch from *schismatics* (2010) Max patch





## Fig. 7: Analysis data from 3<sup>rd</sup> party Max/MSP external objects is mapped:

---

1. to (conditionally) turn live sampling inputs on/off
2. to alter control envelopes for sample playback (play~)
3. to trigger sample playback envelopes (play~)
4. to (conditionally) turn delays on/off
5. to probability controls which select which live samples are to be played
6. to trigger random sample playback (groove~)
7. to control sample playback speeds (groove~)
8. to control frequency shifting (proportional to amplitude envelope)
9. to auto-select DSP configurations (sound processing effects)



Fig. 8:  
Main Max/MSP patch from *schismatics* (2010)

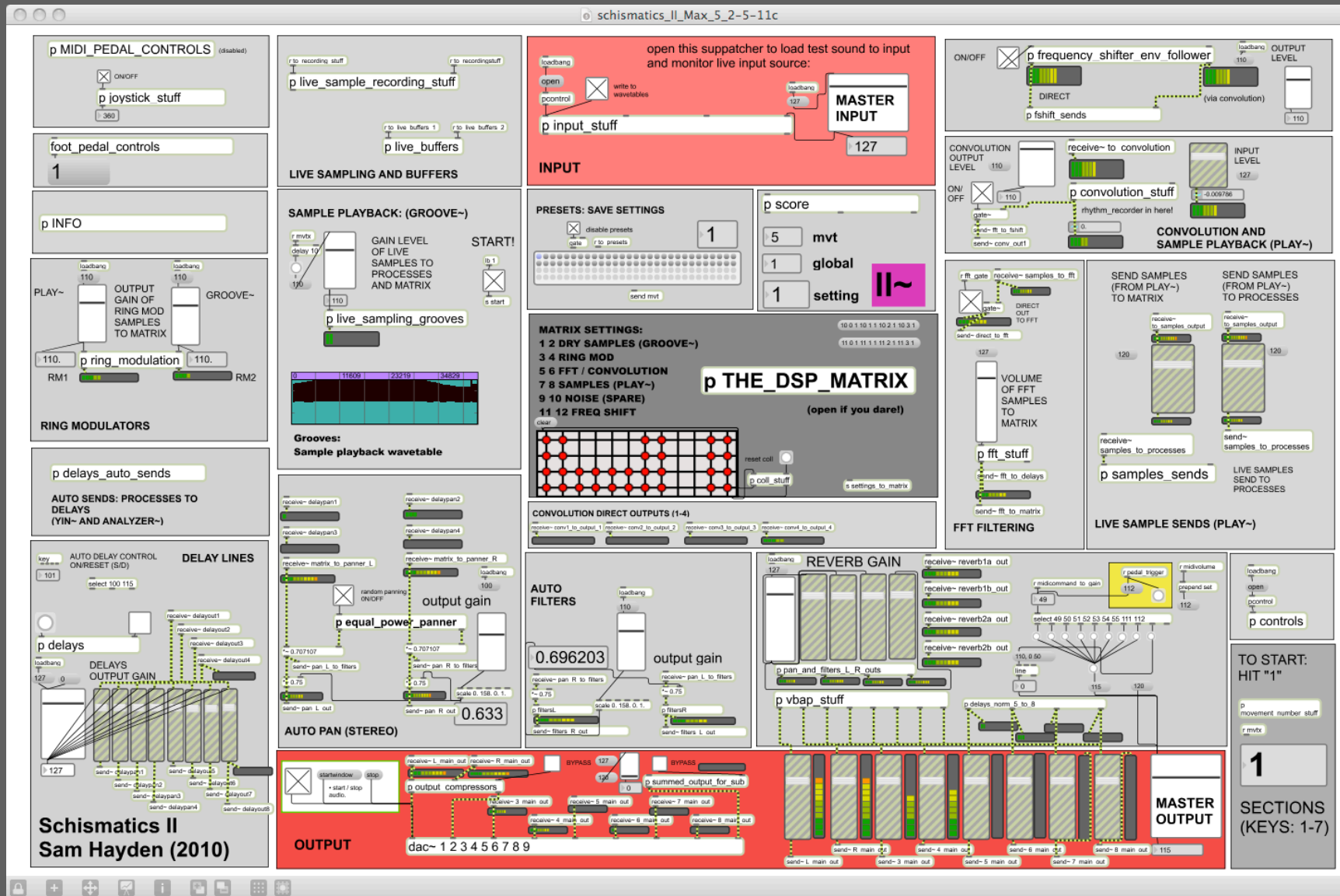


Fig. 9:  
Project website

---

<http://www.dur.ac.uk/music/intcompviolproject/>