Jürgen Frenz

BFA - Sound Department
Semesters of Sept 2009 to June 2010 Postgraduate Students

Sound Production & Synthesis / Sound Design

Syllabus

1. **Course content**
2. **Duration / instruction with lecturer**
3. **Assessment**
4. **Weekly syllabus**
5. **Reading material for this course**
6. **Lecturer's contact**
7. **Further reading / self study**

1. Course content and purpose

We will study Puredata programming language with the goal to better understand the possibilities of live media, interactive media and mixed audio/video media. Term 1 introduces the language and in term 2 you will realize a project in Pd (I stand by to guide).

2. Duration / instruction with lecturer

The 1st term is scheduled for a duration of 2 hours on wednesday nights starting Sept 23rd 2009 at 18:00 for the duration of the entire semester (16 weeks).

3. Assessment

There will be almost weekly assignments and your final mark is the combination of your submitted work.

4. Weekly syllabus

Week 01 - Sept 23rd
First contacts, object types, moving and changing elements. Execution order, mathematical and logical operations, types of data, float point mathematics

Week 02 - Sept 30th
Message types, processing of lists, variables, file operations, storing and routing of data, GUI objects

Week 03 - Oct 7th *National Holiday*

Week 04 - Oct 14th
Time operations, delay, ramps, summary of GUIs, sub patches, sending data between patches

Week 05 – Oct 21st
Summary of synthesis techniques and traditional building elements. MIDI and audio in Pd, sampling frequency, Nyquist, audio levels in Pd, Audio in/out and sending /receiving between patches. Additive synthesis.

Week 06 – Oct 28th
More additive synthesis. Theory of digital filter design and filters in Pd.

Week 07 – Nov 4th
Sampling in Pd, audio file retrieval and storage in Pd. Arrays and tables, audio delay, selective playback, looping. Creative use of reverb, feedback, comb filters.

Week 08 – Nov 11th
Karplus-Strong modeling algorithm, table oscillators, wave shaping synthesis and transfer functions. First introduction to windowing.

Week 09 – Nov 18th
More possibilities of wave shaping and selective harmonics. Modulation synthesis (AM, FM and phase modulation) in Pd. Live modulation.

Week 10 – Nov 25th
Granular synthesis – theory and application in Pd. Live granular synthesis.

Week 11 – Dec 2nd
FFT. Theory and use in Pd.

Week 12 – Dec 9th
More FFT with externals. Pitch detection and pitch follower.

Week 13 – Dec 16th
Compressors and other level control in Pd. Spatialization in Pd.

Week 14 – Dec 23rd
More controls over sound in Pd. Recursive processing, algorithmic composition.

Week 15 – Dec 30th
Sequencers and score files in Pd. Modifying lists. Detection of mouse position and other HID. All about MIDI in Pd. Networking sound and controller data. OSC. Expansion and modification od Pd. Basics of data structures for graphical objects and video.

Week 16 – Jan 6th
Listening: Your submissions of the term. Critique. Making plans for next term.

5. Reading material for this course

- Johannes Kreidler : "Programming Electronic Music in Pd" [2008] – available as a free download in pdf format and handed out by your lecturer. Includes the patches.

  I STRONGELY ADVICE YOU TO PRINT THIS OUT FOR MAKING NOTES ETC.

- FLOSS Manual for Puredata – free download from FLOSS manuals website. Very basic and regularly updated.

6. Lecturer's contact

Jürgen Frenz e-mail: 1soundscape@gmail.com

7. Further reading / self study

THE FIRST THREE PUBLICATIONS ARE HIGHLY RECOMMENDED :

"The Bang Book" 2004 Music University of Graz. The book is available as a free download in pdf format and for sale as a bound book.

Curtis Roads: "The computer Music Tutorial", 1996 MIT Press. There is a chinese language edition announced for the end of this year (2009).

Miller Puckette : "The Theory and Technique of Electronic Music", 2006. Available for a lot of money or free as a pdf on Miller's website. Very complex.

There are many articles on-line that describe a particular problem / process in Pd.