

piano_prosthesis

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Indicative Score & Instructions

Introduction

This score can be used as a creative starting point, as a open-form score that defines all materials you use, or ignored.

The overall aim is to establish clearly differentiated musical materials, characterised by pitch, loudness, density, rhythmic activity, sustained-ness and the degree of internal variation (within a timeframe of 10-20 sec.) Having decided upon materials, either in advance or during the performance, the improvisation should focus on recalling and varying these types. Silence is recognised as a material. As you introduce new materials or recall previous ones, you should hear complementary responses from the computer improviser, which should seem both reactive and proactive in its behaviour.

Technical Guide

A. Setup (please refer to Max patch).

1. Put DSP ON : adjust input volume to ensure there is a good response from **Event** detect light, **Pitches** and **Features** windows. Adjust *Event threshold* if necessary to ensure a good noteson/notes off response, and to determine when a sustained note decay can be considered 'silent'. NB: If the threshold is too low, this will impair the system's ability to recognise rapid series of note onsets.

2. Learning will only occur if **Features** are steady. This is indicated by the **blue light** in the **Net Training panel**. Adjust the *stability* if necessary: higher values make the Network less 'choosy' about what it may learn, and the blue light will tend to light up more often.

3. You can test the computer audio output if you have played notes that have registered in the **Pitches** window. Select a playback behaviour from the *Test Output* menu in the **Controls panel**. Click on the playback toggle (turns purple). After testing, **Pitches** can be reset by clicking on *Pitch Reset* in the **Controls panel**.

4. Choose *scramble* option (only do this if the default is not wanted). This determines how the system generates the sequence of new musical behaviours that appear as new input states are learned. The order is reshuffled every time the patch is opened, reset, or one of the options are chosen (or re-chosen). The options are:

- GROUPED (default): random order ensuring contrast from one behaviour to the next.
- RANDOM: random ordering of all 37 states.
- MORE SILENT: same as grouped, but ensures that more 'silent' modes are chosen in the first 12 behaviours: I.e. system is less active generally.
- AUTO: same as grouped, but re-scrambles every two minutes or so. (best avoided unless you have a very low boredom threshold!)
- ZEROAUTO: same as grouped, but the behaviour assigned to input silence is changed randomly every two minutes or so. I.e. the response to your silence changes every two minutes or so.

B. Rehearsing

The best way to prepare is to be familiar with the response of the **Features** window and **Pitches** window. Experiment with these, particularly try to get a feel for how easily the **Features** window settles into a fixed state (indicated by blue light in Net Training panel).

C. Playing

1. NB: there can be no audible playback until pitches are shown in the **Pitches** window. You can clear the pitches to start afresh with by pressing *clear pitches* in the *Controls panel*.

2. The individual pitches of chords are not recognised! So chords will usually not contribute new pitches to the **Pitches** window. Only single notes, keyed or plucked, will appear in the **Pitches** window. This limitation can be used creatively to avoid pitch detection when appropriate

3. Sometime after you begin playing, activate Net learning and playback by pressing the large **BEGIN** button, which turns yellow and cannot be deactivated without a system reset or reloading the patch. The Net will learn a first state soon after that, shown by the red light in the Net Training panel.

4. Playback is then ON by default. Toggle playback to toggle playback off/on during performance if you wish, (ideally this should never be necessary) and to end the performance. You can use the 'sleep' option if desired: system tends to stop when you stop, if sleep is ON.

5. The *Net Training Comparator* value will decrease after the first two states are learned. If necessary, adjust the *Comparator threshold* to encourage/discourage new learning. You can monitor your current playing, represented by the blue horizontal bar. When this bar meets the current *Comparator value* (shown in the slider) your playing is now sufficiently different from previous states to be allowed to train the network. Higher comparator values discourage learning: a value of 1. prevents learning. A value > 0.3 will usually ensure that the current **Features** are learnt as a new state. About 0.4 is a good value to work with. If the system learns input states without enough discrimination, the system will work but will tend to sound more jumbled and 'grey' overall.

D. Adding user controllers.

Ideally, it should not be necessary in performance for you to interact directly with the Max patch. However you may wish to have access to controls; e.g. The Comparator threshold can be manipulated in performance to control the rate of learning.

In which case, it may be preferable to use a control interface rather than the computer screen. The following parameters can be controlled via *receive* objects that are already built into the patch (but not used for any other purpose). Create your controller interface Max patch with send objects to conform to the following specification:

<i>Parameter</i>	<i>Send name</i>	<i>Message type</i>	<i>Input Range</i>
BEGIN	s custom-begin	on (int)	1
playback	s custom-play	off or on (int)	0 or 1
sleep	s custom-sleep	off or on (int)	0 or 1
Comparator threshold	s custom-compare	continuous (int)	0 – 100
Stability	s custom-stability	continuous (int)	0 – 100
Clear pitches	s custom-pitches	bang	bang
Scramble type	s custom-scramble	menu items (int)	0 – 4
System reset (screen confirmation needed)	s custom-reset	bang	bang

Score Notation



A definitive pitch range should be established for each occurrence of a material type. The range can be small (one octave or less) or the maximum range of the keyboard, or any range in between. Two bass or treble symbols denote that only the lower or upper half of the full range should be used as a maximum range.

All other notations and instructions are open to interpretation ad lib.

M.Y. May 2009

separates

A musical score for piano, consisting of two staves (treble and bass clefs) with a brace on the left. The notation is sparse, featuring scattered dots representing notes across the staves. A dynamic marking $\{pp/mp\}$ is placed in the treble staff. The score ends with a dashed vertical line on the right.

unphrased; slightly detached & uneven;
wide pitch space; effortless

remembering

A musical score for piano, consisting of two staves (treble and bass clefs) with a brace on the left. The notation is more dense than the first piece, with various note values, slurs, and ties. A dynamic marking $\{p \ll mp\}$ is placed below the staves.

A continuation of the musical score for 'remembering', showing two staves (treble and bass clefs) with a brace on the left. The notation includes slurs and ties, indicating sustained notes. The score ends with a dashed vertical line on the right.

narrow pitch space; even rhythms with pauses;
some notes sustained through;
little phrases hint at each other; whistful

pulsing

A musical score for piano, consisting of two staves (treble and bass clef). The music is characterized by a steady, rhythmic pulse. The notes are grouped in a way that creates a sense of forward motion. The dynamic marking is {mf/p}. The score ends with a dashed vertical line on the right.

reinvent fixed-pitch chords in new groupings;
restrict pitch space; regular with short pauses now and then;
mildly insistent;

locking

A musical score for piano, consisting of two staves (treble and bass clef). The music is characterized by a series of repeated rhythmic patterns, often with a 'locking' feel. The notes are grouped in a way that creates a sense of forward motion. The dynamic marking is *f*. The score is divided into several measures by double bar lines.

vary repeats - sometimes don't repeat;
alter tempo on repeats; pitch space is wide or narrow;
well-articulated; emphatic, not aggressive

frantic

Musical score for 'frantic' in G major, 2/4 time. The score consists of two systems, each with a grand staff (treble and bass clefs). The first system begins with a dynamic marking of $\{pp \ll \gg mf\}$. The music is characterized by rapid, irregular eighth-note patterns with frequent ledger lines, creating a sense of frantic activity. The second system continues this pattern, ending with a dashed line indicating a continuation.

mid-pitches stretch out to extremes;
suddenly irregular; you can take a breath;
not assertive, hesitant;

resist

Musical score for 'resist' in G major, 2/4 time. The score consists of two systems, each with a grand staff. The first system begins with a dynamic marking of $\{ff/mp\}$. The music features long, sustained notes and clusters, often with ledger lines, suggesting a sense of resistance or struggle. The second system continues with similar textures, ending with a dashed line.

hold & release; very long or less long;
clusters and sometimes far reaches;
appearing to have purpose;

deep pluck

The musical score for 'deep pluck' consists of two systems, each with a grand staff (treble and bass clefs). The first system begins with a dynamic marking of *{f/mp}*. The notation features a prominent, thick horizontal line across the bass clef staff, indicating a sustained or heavily accented chord. Above this line, various notes and rests are written in the treble clef staff, some with stems pointing downwards. The second system continues this pattern, with a dashed vertical line at the end of the piece.

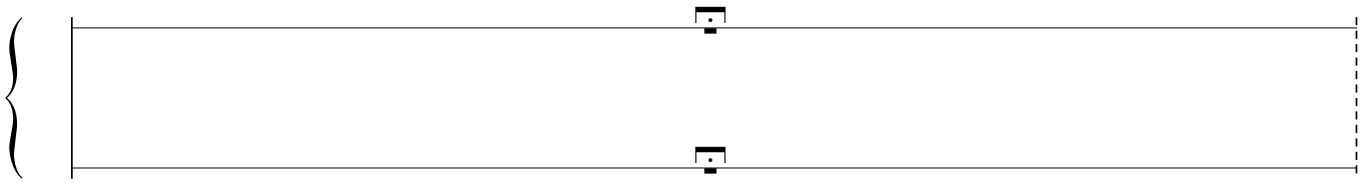
nail or thumb; find harmonics, or not;
easy or forceful;
allow some to resonate; animate

morse

The musical score for 'morse' features a grand staff with a dynamic marking of *mf*. The upper part of the score is dominated by dense, vertical clusters of notes, resembling a Morse code rhythm. The lower part of the score, in the bass clef, consists of sparse, rhythmic notes with stems pointing downwards, corresponding to the clusters above. A dashed vertical line marks the end of the piece.

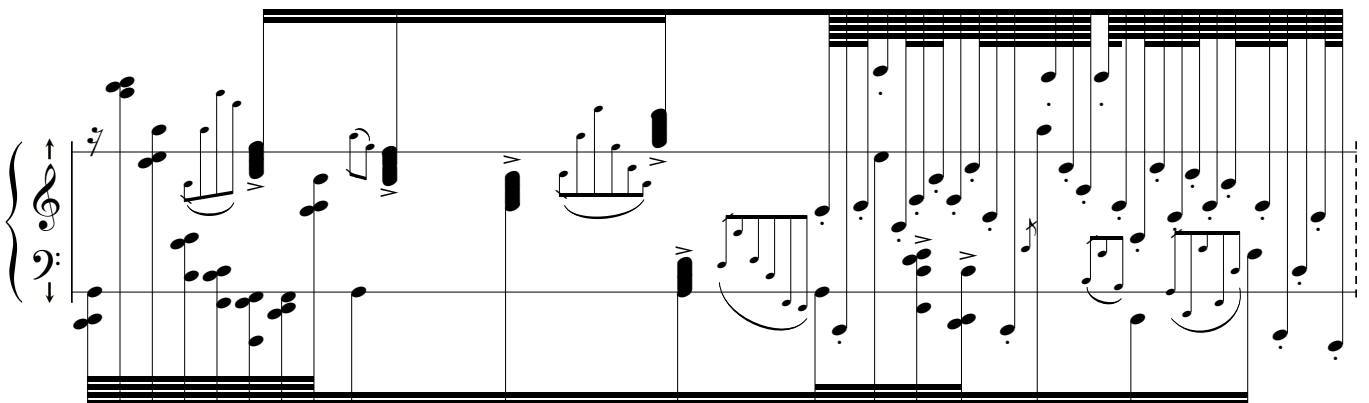
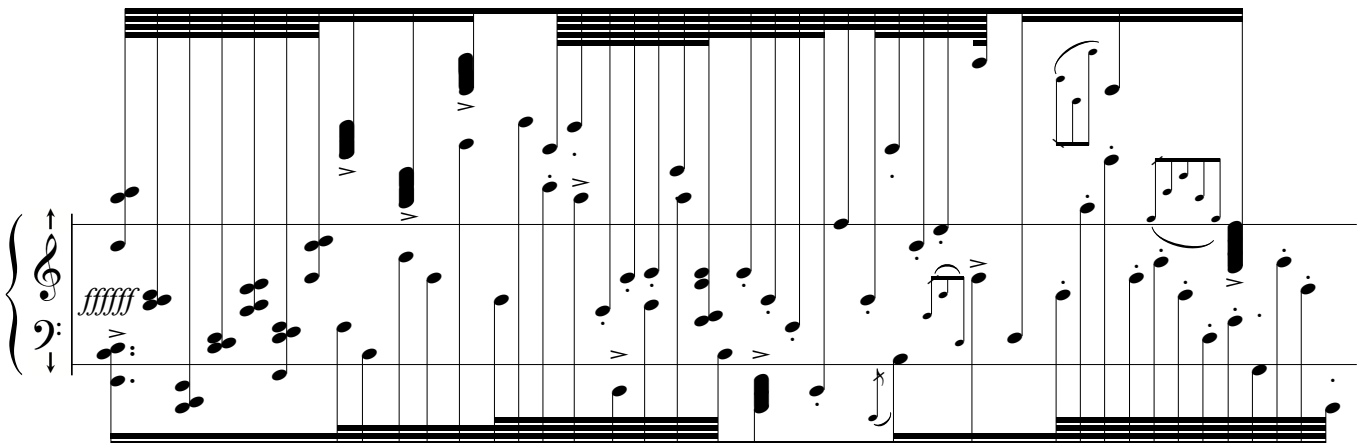
regular, a little; tap it out, detached;
articulate below;
as if there's something to say;

listen



as if something is being said;

monster



almost in control; excessively loud & unremitting;
mechanical maniacal;

roundabout

The musical score for 'roundabout' consists of two systems. The first system begins with a repeat sign and a first ending bracket. Above the first ending, there is a 'X n' instruction with an arrow pointing to the right. The piano part features a complex, repetitive melodic line with many notes, some with stems pointing upwards. The bass line has a steady eighth-note accompaniment. The dynamic marking *{f/mp}* is placed below the piano part. The second system continues the melodic and bass lines, ending with a dashed vertical line.

even, well-articulated; not forceful;
always in-and-out of repeats to vary in length & number;
flighty;

sweet

The musical score for 'sweet' consists of two systems. The piano part features a sparse, melodic line with notes and rests. The bass line has a steady eighth-note accompaniment. The dynamic marking *mp* is placed below the piano part. The score ends with a dashed vertical line.

try to sound out-of-tune; favour clusters;
explore similar groups with slight changes;
sickly;

aurora

Musical score for 'aurora' in G major, 3/4 time. The score consists of two staves, Treble and Bass clef. The dynamic marking is $\{mf/ff\}$. The piece features a series of chords and melodic fragments, some with upward-pointing arrows indicating plucking or sweeping. A 'Ped.' (pedal) line is shown below the staves, indicating a sustained pedal point.

plucked or swept; experiment; dampen or harsh; ring, finger or nail on string; resonant;

pianism

Musical score for 'pianism' in G major, 3/4 time. The score consists of two systems, each with Treble and Bass clef staves. The dynamic marking is $\{pp/mp - f\}$. The piece is characterized by constant rhythmic and melodic changes, including many sixteenth and thirty-second notes. It features various articulations such as accents, staccato, and plucking. Some chords are marked with horizontal lines, suggesting sustained or complex textures.

constant change; lightly, mildly percussive; vary hammer & pluck; caprice no consequence;

expansive

Musical score for 'expansive' featuring two systems of piano accompaniment. The first system includes a dynamic marking of $\{mp/f - ppppp\}$. The notation is spread across a wide range of the piano keyboard, with notes extending to the extreme high and low registers. The music consists of various chordal textures and melodic lines, with some notes appearing as floating circles above the staff lines.

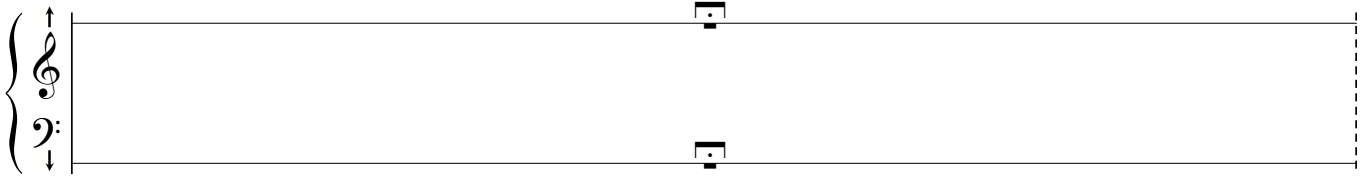
full range with a far reach; chordal in extremis;
pondering but aimless;

notwalking

Musical score for 'notwalking' featuring two systems of piano accompaniment. The first system includes a dynamic marking of $\{p < mf\}$. The notation is characterized by a dense, continuous texture of notes, with a thick block of notes in the lower register and a more sparse, flowing line in the upper register. A large, sweeping slur encompasses the entire piece.

fluid and gently on top;
breathing with pause;

listen again



as something might yet is said;