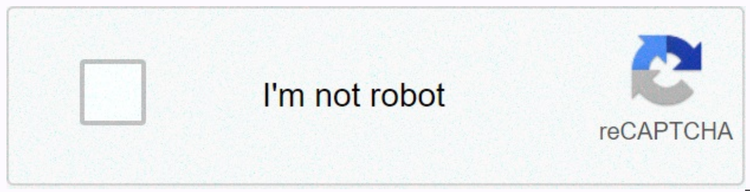

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Pitch class set prime form

Many concepts in pitch-class set theory are best viewed along a sliding scale of concrete or abstract. A concept like step, for example, is very specific, while the pitch category is somewhat more abstract. We can play a stadium, but we can't play a stadium. We've seen similar examples in space. Sorted step spaces are connected to a very specific sound (e.g. +15). unclassified step category spaces (e.g. space category 1) are less vivid or real. A key concept in tar-class theory set is that these levels of concrete and abstract include not only tar and space, but also groups of tar classes as well. These teams of stadium categories are called pitch-class sets. We've already seen sets of pitch-classes, although we haven't really been calling them that. When we extract a group of notes from a passage of music and put them in normal order, this group of notes is a pitch-class set. As we've seen in class, a very interesting way to look at a lot of post-toal music is by studying the transfer and reversal relationships between pitch-class sets. In the following brief example (from Bartók's Theme and Reflection) you will notice that the right hand of the two fragments is related to the T5, as is the left hand. Within each pass, the right and left hands are T8I _and _T6I related, respectively. Before a step class set can be associated with dragging or reversing with another step class set, they must share the same collection of spaces. This is more easily understood by the memory that all large and small triads have the same content space (M3, m3, and P5). Large triads are associated with each other, while large and small triads are associated with reversal between them. The same observation applies to Bartók's Subject and Reflection. The four pitch-class sets in these two passes all have the same intervallic content and that's why we can tag transfer and reverse relationships with each other. All step class totals associated with drag and reverse belong to the same set class and are represented by the same privileged format. We follow a simple procedure to put a step class set in prime format: Put the step class set in normal order. Face it so that the first class of ass is 0. Reverse the results from step 2 (any reversal will work) and put the result in normal order. Face it so that the first class of ass is 0. Compare the results of steps (2) and (4). Prime format is the most Version. The following example of rides shows using the motivation from Bartók's Theme and Reflection. Share Use this tool to analyze and control the properties of step class sets. [See user instructions >>] Use this page in horizontal mode on mobile devices. 1. Pitch-class set screen and and PC Set 1 Tonisc Tool Overlapping POSITIONS PC Set 2 Toinisc C B C# Bb D A + Eb G# E G F F# C B G# Bb D A + Eb G# E F# C C# Bb D A + Eb # E G F# Subset Analysis for two sets of PCs of different number (i.e., different size) Number of semitons n: 0 1 2 3 4 5 6 7 8 9 10 11 Transfer (Tn): Reversal and transfer (TnI): Similarity relationships for PC sets of equal number (i.e. same size) Number of step similarities Space Similarity 1 2 2 3 4 5 6 7 8 9 n1 n3 n4 n5 n6 2. Pitch-Class Set Analysis Tool Total Name: Note the Root Locations: - Set Status: O I Guidelines for User This page contains a GUI for displaying, transforming, and analyzing Pitch-Class (PC) sets. PC sets can be used as building blocks in atonic music. There's a user guide movie on YouTube: How to use the Pitch Class Set tool (9:18). 1. Pitch-Class set screen and transformation tool This part of the tool is designed to display and transform pitch-class (PC) sets. The GUI has the following features: The screen is divided into three sections. The left and right section allow you to work on two sets of computers independently. The center section displays the overlap between the two sets of computers and is updated automatically. The drop-down menu at the top allows you to select a pitch-class set from a predefined list. The numbers on the list correspond to the label used by Allen Forte in Appendix 1 from his book The Structure of Atonic Music (Yale University Press, New Haven and London, ISBN 0-300-02120-8, 1973). After selecting a specified number, the computer set information table and tone disk (in the center of the section) will display computer set data. The information table has a number of fields: the current computer set number, e.g. 4-19. The current root, e.g., C#, a note name from the color scale. This field is updated after the computer set is transferred. The current state of the computer set. A set can be displayed in several formats: either as an original set (O will be highlighted), as an inverted order, that is, the structure of the set is reflected on the current root (I will be highlighted), or as the Supplement set, that is, notes from the color scale that are not in the current set (C will be highlighted). The O and I are mutually exclusive, the C is alternated on/off. The space vector of the current set, e.g., 101310. This series vector contains six entries n1,n2,n3,n4,n5,n6, featuring the space content of the PC set: n1 is the number of short seconds in the PC set, n2 the number of main seconds, n3 the small thirds, n4 n4 number of main thirds, n5 the number of perfect quarters and n6 the number of increased quarters or reduced fifths. The Comment field contains text, e.g. Octatronic Scale. Additional information is presented here, such as the similarity to a ton of string structure or melodic scale. The tone disc will paint the current note names of the PC set, allowing easy visual inspection of the musical content of the set structure. The disc incorporates the circular nature of the color scale. The Set Transform menu contains four buttons: Pressing the Swap Down button returns a down drag of the computer set by a small second. This corresponds to a counterclockwise rotation in the tone disk diagram. Pressing the Swap Up button gives an upward transfer of the computer set by a small second. This corresponds to a clockwise rotation in the tone disk diagram. Pressing the Supplement button will highlight notes from the full color set (12 tons) that are not currently in the structure. Pressing this button again will highlight the original content of the structure. Pressing the Invert button will reflect the structure of the computer on the current root. The Set Transform menu will be enabled after selecting a specific set of computers. The four buttons can be pressed in any order. The Subset Analysis table shows for which n-tones transfer Tn (or transfer after TnI reversal) the smallest PC set is a subset of the larger PC set (that is, all locations from the smallest set will also be contained in the larger PC set). The first two PC sets must be selected from the top drop-down menu (and obviously must be not of equal size). Check the overview in this table using the Set Transform buttons above the table. Changing the selected set of computers will automatically update the Subset Analysis panel. The Similarity Relationships table shows the similarity of step and space between two sets of computers of the equal base number N. The maximum step similarity is N-1. This often happens, but is usually combined with the space similarity property. Here, the strongest possible similarity indicates that four space class measurements are equal (e.g., n1,n3,n5,n6) and that the remaining two space class measurements (i.e., n2,n4) are exchanged between sets. The navigation menu at the top will take you back to the home page of this website, the Document Archive, or to these Help Guidelines. This website also contains a form, equivalent to this GUI (see the Document Archive). 2. Pitch-class Set Analysis Tool This part of the tool has been to analyze (determine) step class totals. GUI has the following characteristics: The top of the screen has a set of twelve check boxes, corresponding to the note names from the color scale. Place the marks for the appropriate positions contained in the step class set before analysis. There must be between and 9 marks before activating the analysis. Pressing the Analyze button will display the results of the Pitch-Class set analysis. You'll see the following features in the information text fields: The current computer set number, for example, 5-3. The current root, e.g., Eb, a note name from the color scale. The current state of the pc set: after analysis the set can be found to be either in the original or inverted format (the O or I fields will be highlighted). Pressing the Clear All Places button will remove the check marks in the check boxes and delete the text fields in the Information panel. [Back to Contents Table] 3.1 Similar pitch class sets: Set Classes & Prime Forms Some step class sets are very similar, for example: [0,1,4] are very similar to [3,4,7] (transfer), [8,11,0] (reverse), [5,8,9] (transfer and reverse) and [8,9,0] (transfer). For example, try playing the following strings. Do you hear everyone has something in common? A group of similar PC sets such as these is called Pitch Class Set Class, or more simply, a Set Class. There are only 208 different total categories! Each set class is represented by a Prime Form pc set. For example: [0,1,4]; [3,4,7]; [0,3,4]; [5,8,9]; and [8,9,0] all belong to the Primary Form: (0,1,4) Note that parentheses are used to indicate prime forms in this tutorial. However, not everyone agrees to this pension. 3.2 Uses for Prime Form The main form is considered the simplest version of the step class set. Generally, the simplest version of a PC set means that the positions in the set are packed as tightly together as possible, and as far left as possible. Once you know the primary format of a pc set, you can search it in a table of raw forms to get more information about the PC set, such as space vector and colleagues related to PC sets (see appendix). You can also use the privileged form to search for other, relevant PC sets using other software tools. See . If you're a composer, you can use this information to help you better control, understand, and manipulate the harmonys in your music. 3.3 Definition of primary format: The strict method goal: To determine the primary format for any PC set. Example: What is the primary format of [8,0,4,6] ? Step 1: Put the pitch categories in numerical order => [0,4,6,8] Step 2: List all spins of the step class set. To rotate a PC set, simply move number at the end and add 12 to it (i.e. move it up an octave). For example, the rotations of [0,4,6,8] are: [0, 4, 6, 8] [4, 6, 8, 12] [6, 8, 12, 16] [8, 12, 16, 18] Step 3: Determine which rotation of the pc set has the minimum distance between first and last number in total: [0, 4, 6, 8] => (8 – 0) = 8 [4, 6, 8, 12] => (12 – 4) = 8 [6, 8, 12, 16] => (16 – 6) = 10 [8, 12, 16, 18] => (18 – 8) = 10 There is a draw! Versions [0,4,6,8] and [4,6,8,12] have a minimum distance between the first and last 8 Step 4: If there is a draw, select the rotation that has a minimum distance between the first and second numbers: Distances between the first and second numbers: [0, 4, 6, 8] => (4 – 0) = 4 [4, 6, 8, 12] => (6 – 4) = 2 Thus, in our example, [4,6,8,12] is preferred. Step 5: If there is still a draw, then check the first and third numbers, and so on until the draw is resolved. The PC set at this point is in Normal format. Step 6: Transfer the step class set so that the first number is zero: [4 – 4, 6 – 4, 8 – 4, 12 – 4] => [0, 2, 4, 8] Step 7: Reverse the step class set and reduce it using steps 1-5 above. Reversal [0,2,4,8] => [12-0, 12-2, 12-4, 12-8] => [12, 10, 8, 4] => [0, 10, 8, 4] Put in numerical order: [0, 4, 8, 10] Find the best rotation: PC Set (last first) (second first) [0, 4, 8, 10] 10 4 [4, 8, 10, 12] 8 4 [8, 10, 12, 16] 8 2 << Preferred [10,12, 16, 20] 10 2 Transfer down: [2] 8 – 8, 10 – 8, 12 – 8, 16 – 8] => [0, 2, 4, 8] Step 8: Which format, original or inverted, is most packed to the left (has the smallest number)? This will be the First Form. In our example, both formats produced the same Prime Form (this is because the original PC set was inversally symmetrical), and so the Prime Form is (0, 2, 4, 8) 3.4 Determination of the primary format: Easier Methods Option 1: Use an online tool in . Option 2: Calculate it on the piano Step 1: Continue to rotate your string until it is as small as possible. Step 2: If there are links, then use the rotation that has the notes more packed down. Step 3: Check to see if the inversion is better packaged. Option 3: Use the Simplified Set List on the back of The Tous Theory by Joseph N. Straus. Option 4: Use a MAX/MSP patch that displays the privileged format of a string you play on the MIDI keyboard. Option 5: Use the table of all the first forms. For example, 1) First find the space vector, and then look for it in the table of all PC sets (see below) or 2) skip steps 6 & 7 above and look for the reversal in the table. Option 6: Visualize the pitch class set on a watch face and locate the privileged format visually Step 1: The shortest distance travelled Step 2: Numbers packed as close as possible to the starting point. For example, the form [0,8,6,8] is (0,2,4,8); and its main form [2,4,8,9] is (01,15,7) : Copyright © 2004-2017 by Paul Nelson, all rights reserved. Reserved.

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