CRIM Test File Discussion

Chromatic Exact

All correct. These are EXACT CHROMATIC matches.
The machine finds all the statements in EX A, and TWO of them in EX B.
But it correctly ignored A14 and T16, which flex.

Pattern Generating Match	Pattern matched	Piece Title	Part	First Note Measure Number	Last Note Measure Number	Note Durations
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	[Superius]	1	4	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	[Superius]	12	15	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Altus	3	6	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]

[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Tenor	5	8	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Bassus	7	10	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Bassus	18	21	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]

These are EXACT CHROMATIC matches in EX C.
All Correct!
It ignored A24, which is only a diatonic match.
The bassus was rhythmically flexed (8.0 instead of 4.0 2x) but that is ignored by the system, so it is a 'match'

[-3, -2, 5, 2, 2]	[-3, -2, 5, 2, 2]	Ave Maria	[Superius]	23	26	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 2]	[-3, -2, 5, 2, 2]	Ave Maria	Tenor	27	30	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 2]	[-3, -2, 5, 2, 2]	Ave Maria	Bassus	28	32	[8.0, 4.0, 4.0, 8.0, 8.0, 4.0]

Chromatic Close

Finding close matches...
3 melodic intervals had more than 2 exact or close matches.

All Correct, since most are in fact EXACT matches anyway!
Again, finds all the occurrences in EX A and two of those in EX B
DOES find A 14 in Ex B, since it differs only by a total of "4"
But it did NOT include T16 in RH B, which differn by more than 4

Pattern Generating	Pattern matched	Piece Title	Part	First Note Measure	Last Note Measure	Note Durations

Match				Number	Number	
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	[Superius]	1	4	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	[Superius]	12	15	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Altus	3	6	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[7, -2, 2, 2, -4]	Ave Maria	Altus	14	17	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Tenor	5	8	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Bassus	7	10	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, 0, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Bassus	18	21	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]

Here is the reverse match, based on the Altus 14 as the generating pattern.
Now the T16 is a match, because it's actually close enough to A14!

[7, -2, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	[Superius]	1	4	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[7, -2, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	[Superius]	12	15	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[7, -2, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Altus	3	6	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[7, -2, 2, 2, -4]	[7, -2, 2, 2, -4]	Ave Maria	Altus	14	17	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[7, -2, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Tenor	5	8	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[7, -2, 2, 2, -4]	[7, -3, 3, 2, -4]	Ave Maria	Tenor	16	19	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[7, -2, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Bassus	7	10	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[7, -2, 2, 2, -4]	[5, 0, 2, 2, -4]	Ave Maria	Bassus	18	21	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]

These are all correct. EX C: This time A24 is included this time because it is 1 edit away, and thus within the setting for the threshold: find_close_matches(patterns, 2, 4). (Compare with Generic+Exact below, where this soggetto also matches!)

[-3, -2, 5, 2, 2]	[-3, -2, 5, 2, 2]	Ave Maria	[Superius]	23	26	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 2]	[-3, -2, 5, 2, 1]	Ave Maria	Altus	24	27	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 2]	[-3, -2, 5, 2, 2]	Ave Maria	Tenor	27	30	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 2]	[-3, -2, 5, 2, 2]	Ave Maria	Bassus	28	32	[8.0, 4.0, 4.0, 8.0, 8.0, 4.0]

Here is the reverse, based on A24:

[-3, -2, 5, 2, 1]	[-3, -2, 5, 2, 2]	Ave Maria	[Superius]	23	26	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 1]	[-3, -2, 5, 2, 1]	Ave Maria	Altus	24	27	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 1]	[-3, -2, 5, 2, 2]	Ave Maria	Tenor	27	30	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 5, 2, 1]	[-3, -2, 5, 2, 2]	Ave Maria	Bassus	28	32	[8.0, 4.0, 4.0, 8.0, 8.0, 4.0]

These are all correct, Ex D. These are not from the _start_ of the Fuga, but they are close. The S=A and The Tenor and Bassus are within 2 edits of the S.

[-3, 1, -1, -2, -2]	[-3, 1, -1, -2, -2]	Ave Maria	[Superius]	35	37	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-3, 1, -1, -2, -2]	[-3, 1, -1, -2, -2]	Ave Maria	Altus	36	38	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-3, 1, -1, -2, -2]	[-1, 1, -1, -2, -2]	Ave Maria	Tenor	38	40	[1.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-3, 1, -1, -2, -2]	[-2, 3, -1, -2, -2]	Ave Maria	Bassus	41	43	[3.0, 1.0, 3.0, 1.0, 4.0, 8.0]

There are other D segments, too. Some are 'reverses' of each other, and some include the repeating motives of the D soggetto (see doubles for T and B)

[-2, -2, 2, -2, -1]	[-2, -2, 2, -3, 1]	Ave Maria	Altus	35	37	[3.0, 1.0, 4.0, 4.0, 4.0, 3.0]
[-2, -2, 2, -2, -1]	[-2, -2, 2, -2, -1]	Ave Maria	Tenor	37	38	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -2, 2, -2, -1]	[-2, -1, 1, -1, -2]	Ave Maria	Tenor	38	39	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -2, 2, -2, -1]	[-2, -1, 3, -2, -1]	Ave Maria	Bassus	40	41	[1.0, 3.0, 1.0, 3.0, 1.0, 3.0]
[-2, -2, 2, -2, -1]	[-1, -2, 3, -1, -2]	Ave Maria	Bassus	41	42	[1.0, 3.0, 1.0, 3.0, 1.0, 4.0]
[-2, -1, 1, -1, -2]	[-2, -2, 2, -2, -1]	Ave Maria	Tenor	37	38	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -1, 1, -1, -2]	[-2, -1, 1, -1, -2]	Ave Maria	Tenor	38	39	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -1, 1, -1, -2]	[-2, -1, 3, -2, -1]	Ave Maria	Bassus	40	41	[1.0, 3.0, 1.0, 3.0, 1.0, 3.0]
[-2, -1, 1, -1, -2]	[-1, -2, 3, -1, -2]	Ave Maria	Bassus	41	42	[1.0, 3.0, 1.0, 3.0, 1.0, 4.0]
[-1, 1, -1, -2, -2]	[-3, 1, -1, -2, -2]	Ave Maria	[Superius]	35	37	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-1, 1, -1, -2, -2]	[-3, 1, -1, -2, -2]	Ave Maria	Altus	36	38	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-1, 1, -1, -2, -2]	[-1, 1, -1, -2, -2]	Ave Maria	Tenor	38	40	[1.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-1, 1, -1, -2, -2]	[-1, 3, -2, -1, -2]	Ave Maria	Bassus	40	41	[3.0, 1.0, 3.0, 1.0, 3.0, 1.0]
[-1, 1, -1, -2, -2]	[-2, 3, -1, -2, -2]	Ave Maria	Bassus	41	43	[3.0, 1.0, 3.0, 1.0, 4.0, 8.0]
[-2, -1, 3, -2, -1]	[-2, -2, 2, -2, -1]	Ave Maria	Tenor	37	38	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -1, 3, -2, -1]	[-2, -1, 1, -1, -2]	Ave Maria	Tenor	38	39	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -1, 3, -2, -1]	[-2, -1, 3, -2, -1]	Ave Maria	Bassus	40	41	[1.0, 3.0, 1.0, 3.0, 1.0, 3.0]
[-2, -1, 3, -2, -1]	[-1, -2, 3, -1, -2]	Ave Maria	Bassus	41	42	[1.0, 3.0, 1.0, 3.0, 1.0, 4.0]
[-1, 3, -2, -1, -2]	[-1, 1, -1, -2, -2]	Ave Maria	Tenor	38	40	[1.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-1, 3, -2, -1, -2]	[-1, 3, -2, -1, -2]	Ave Maria	Bassus	40	41	[3.0, 1.0, 3.0, 1.0, 3.0, 1.0]
[-1, 3, -2, -1, -2]	[-2, 3, -1, -2, -2]	Ave Maria	Bassus	41	43	[3.0, 1.0, 3.0, 1.0, 4.0, 8.0]
[-1, -2, 3, -1, -2]	[-2, -2, 2, -2, -1]	Ave Maria	Tenor	37	38	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-1, -2, 3, -1, -2]	[-2, -1, 1, -1, -2]	Ave Maria	Tenor	38	39	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-1, -2, 3, -1, -2]	[-2, -1, 3, -2, -1]	Ave Maria	Bassus	40	41	[1.0, 3.0, 1.0, 3.0, 1.0, 3.0]

[-1, -2, 3, -1, -2]	[-1, -2, 3, -1, -2]	Ave Maria	Bassus	41	42	[1.0, 3.0, 1.0, 3.0, 1.0, 4.0]
[-2, 3, -1, -2, -2]	[-3, 1, -1, -2, -2]	Ave Maria	[Superius]	35	37	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 3, -1, -2, -2]	[-3, 1, -1, -2, -2]	Ave Maria	Altus	36	38	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 3, -1, -2, -2]	[-1, 1, -1, -2, -2]	Ave Maria	Tenor	38	40	[1.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 3, -1, -2, -2]	[-1, 3, -2, -1, -2]	Ave Maria	Bassus	40	41	[3.0, 1.0, 3.0, 1.0, 3.0, 1.0]
[-2, 3, -1, -2, -2]	[-2, 3, -1, -2, -2]	Ave Maria	Bassus	41	43	[3.0, 1.0, 3.0, 1.0, 4.0, 8.0]

Diatonic Exact

What happens if we use Diatonic (generic intervals instead?)
This time In Ex B A14 and T16 are omitted, because they are flexed.

Pattern Generating Match	Pattern matched	Piece Title	Part	First Note Measure Number	Last Note Measure Number	Note Durations
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	[Superius]	1	4	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	[Superius]	12	15	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Altus	3	6	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Tenor	5	8	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Bassus	7	10	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Bassus	18	21	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]

But in Ex C all the parts are matches, because they are diatonically identical:

[-3, -2, 4, 2, 2]	[-3, -2, 4, 2, 2]	Ave Maria	[Superius]	23	26	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 4, 2, 2]	[-3, -2, 4, 2, 2]	Ave Maria	Altus	24	27	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 4, 2, 2]	[-3, -2, 4, 2, 2]	Ave Maria	Tenor	27	30	[8.0, 4.0, 4.0, 4.0, 4.0, 4.0]
[-3, -2, 4, 2, 2]	[-3, -2, 4, 2, 2]	Ave Maria	Bassus	28	32	[8.0, 4.0, 4.0, 8.0, 8.0, 4.0]

Diatonic Close

What happens if we use Diatonic (generic intervals instead?)
Vectors5 Threshold4

Is the EX B Tenor 16 found at a threshold =4 ? It does NOT appear in the main match of 4,1,2,2,-3.

Pattern Generating Match	Pattern matched	Piece Title	Part	First Note Measure Number	Last Note Measure Number	Note Durations	
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	[Superius]	1	4	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]	
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	[Superius]	12	15	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]	
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Altus	3	6	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]	
[4, 1, 2, 2, -3]	[5, -2, 2, 2, -3]	Ave Maria	Altus	14	17	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]	

[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Tenor	5	8	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]	
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Bassus	7	10	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]	
[4, 1, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Bassus	18	21	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]	

But it IS matched in Reverse, with 1, 2, 2, -3 is a variant of _it_.

find_close_matches(patterns, 2, 4)

[5, -2, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	[Superius]	1	4	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, -2, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	[Superius]	12	15	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, -2, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Altus	3	6	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, -2, 2, 2, -3]	[5, -2, 2, 2, -3]	Ave Maria	Altus	14	17	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, -2, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Tenor	5	8	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, -2, 2, 2, -3]	[5, -3, 3, 2, -3]	Ave Maria	Tenor	16	19	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, -2, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Bassus	7	10	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]
[5, -2, 2, 2, -3]	[4, 1, 2, 2, -3]	Ave Maria	Bassus	18	21	[4.0, 8.0, 4.0, 4.0, 4.0, 8.0]

What about the tricky Ex D, with varied ornamentation of the Soggetto?

All four voices are matched with Diatonic and V5 T4, but only because the descending 2nds in the melodic motives resemble each other. That is: the T38 and B 40, B 41 close matches are shorter than those in the S and A. For a better structural match we will need to wait for the incremental offset matches.

[-3, 2, -2, -2, -2]	[-3, 2, -2, -2, -2]	Ave Maria	[Superius]	35	37	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-3, 2, -2, -2, -2]	[-3, 2, -2, -2, -2]	Ave Maria	Altus	36	38	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-3, 2, -2, -2, -2]	[-2, 2, -2, -2, -2]	Ave Maria	Tenor	38	40	[1.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-3, 2, -2, -2, -2]	[-2, 3, -2, -2, -2]	Ave Maria	Bassus	40	41	[3.0, 1.0, 3.0, 1.0, 3.0, 1.0]
[-3, 2, -2, -2, -2]	[-2, 3, -2, -2, -2]	Ave Maria	Bassus	41	43	[3.0, 1.0, 3.0, 1.0, 4.0, 8.0]

There are also other ‘close matches’ in this region, suggesting an affinity among the motives.

[-2, -2, 2, -2, -2]	[-2, -2, 2, -2, -2]	Ave Maria	Tenor	37	38	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -2, 2, -2, -2]	[-2, -2, 2, -2, -2]	Ave Maria	Tenor	38	39	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -2, 2, -2, -2]	[-2, -2, 3, -2, -2]	Ave Maria	Bassus	40	41	[1.0, 3.0, 1.0, 3.0, 1.0, 3.0]
[-2, -2, 2, -2, -2]	[-2, -2, 3, -2, -2]	Ave Maria	Bassus	41	42	[1.0, 3.0, 1.0, 3.0, 1.0, 4.0]
[-2, 2, -2, -2, -2]	[-3, 2, -2, -2, -2]	Ave Maria	[Superius]	35	37	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 2, -2, -2, -2]	[-3, 2, -2, -2, -2]	Ave Maria	Altus	36	38	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 2, -2, -2, -2]	[-2, 2, -2, -2, 2]	Ave Maria	Tenor	37	39	[1.0, 4.0, 3.0, 1.0, 4.0, 3.0]
[-2, 2, -2, -2, -2]	[-2, 2, -2, -2, -2]	Ave Maria	Tenor	38	40	[1.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 2, -2, -2, -2]	[-2, 3, -2, -2, -2]	Ave Maria	Bassus	40	41	[3.0, 1.0, 3.0, 1.0, 3.0, 1.0]
[-2, 2, -2, -2, -2]	[-2, 3, -2, -2, -2]	Ave Maria	Bassus	41	43	[3.0, 1.0, 3.0, 1.0, 4.0, 8.0]
[-2, -2, 3, -2, -2]	[-2, -2, 2, -2, -2]	Ave Maria	Tenor	37	38	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -2, 3, -2, -2]	[-2, -2, 2, -2, -2]	Ave Maria	Tenor	38	39	[3.0, 1.0, 4.0, 3.0, 1.0, 4.0]
[-2, -2, 3, -2, -2]	[-2, -2, 3, -2, -2]	Ave Maria	Bassus	40	41	[1.0, 3.0, 1.0, 3.0, 1.0, 3.0]
[-2, -2, 3, -2, -2]	[-2, -2, 3, -2, -2]	Ave Maria	Bassus	41	42	[1.0, 3.0, 1.0, 3.0, 1.0, 4.0]

[-2, 3, -2, -2, -2]	[-3, 2, -2, -2, -2]	Ave Maria	[Superius]	35	37	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 3, -2, -2, -2]	[-3, 2, -2, -2, -2]	Ave Maria	Altus	36	38	[4.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 3, -2, -2, -2]	[-2, 2, -2, -2, -2]	Ave Maria	Tenor	38	40	[1.0, 4.0, 3.0, 1.0, 4.0, 8.0]
[-2, 3, -2, -2, -2]	[-2, 3, -2, -2, -2]	Ave Maria	Bassus	40	41	[3.0, 1.0, 3.0, 1.0, 3.0, 1.0]
[-2, 3, -2, -2, -2]	[-2, 3, -2, -2, -2]	Ave Maria	Bassus	41	43	[3.0, 1.0, 3.0, 1.0, 4.0, 8.0]

Incremental Offset Exact

Incremental Match@4 (=whole note) finds the resemblance in Ex D perfectly:

[-3, 2, -3, 2, -3]	[-3, 2, -3, 2, -3]	Ave Maria	[Superius]	34	36	[4, 4, 4, 4, 4, 4]
[-3, 2, -3, 2, -3]	[-3, 2, -3, 2, -3]	Ave Maria	Altus	35	37	[4, 4, 4, 4, 4, 4]
[-3, 2, -3, 2, -3]	[-3, 2, -3, 2, -3]	Ave Maria	Tenor	37	39	[4, 4, 4, 4, 4, 4]
[-3, 2, -3, 2, -3]	[-3, 2, -3, 2, -3]	Ave Maria	Bassus	40	42	[4, 4, 4, 4, 4, 4]

Classify Presentation Types

classify_matches(close_matches, 8) builds on the data derived from Exact or Close matches. But with a crucial difference: here DURATIONS ARE CONSIDERED in finding the Presentation Types. The last number sets the threshold for _rhythmic_ difference.

In an initial classification with

- **patterns = into_patterns([vectors.generic_intervals], 4)** [that is: at least four vectors]

- close_matches = find_close_matches(patterns, 2, 4) [that is, a maximum sum of “4” for intervallic differences]
- classify_matches(close_matches, 2) [that is, a max of “2” for durational differences]

The system finds the PEN in A, the Flexed Pen in B, the Fuga in C (albeit using some hidden motives.
Also finds some ‘hidden’ IDs between the second 1/2 of A and the first 1/2 of B
But does NOT find the ID in C. Why not? Because the Bassus entry replaces two durations of SB with B. Thus a durational ‘difference’ of 8.

Solution:

If I set the Vector Size to “3”, then Classify catches the ID at m. 23 just fine.

> Imitative Duo:
> Pattern: [-3, -2, 4], Locations in entry:
> - Measure 23 in voice 1
> - Measure 24 in voice 2
> - Measure 36 in voice 1
> - Measure 37 in voice 2

OR

If I set the Vectors@4, and Duration Threshold in the Classifier to “8" it also catches it. That makes sense, since the last entry durations differ by exactly that amount.

> Imitative Duo:
> Pattern: [-3, -2, 4, 2], Locations in entry:
> - Measure 23 in voice 1
> - Measure 24 in voice 2
> - Measure 27 in voice 3
> - Measure 28 in voice 4

Bottom line: users will need to turn dials to get the level of exactness or flexing that they want. I will need to make some basic recommendations.

Test Of Model 15 (Manchicourt)

Incremental Offset = 2
Generic Intervals
Exact Matches
Vectors = 6 minimum

Good:

- Finds patterns by offset and ‘sees’ through diminutions to understand fundamental pattern.
- Rhythmic flexes at the outset of a soggetto somehow work out as matches, since we pick up the _second_ note of one that has been elongated!
- Melodic flexes match (even though we are using Exact), based on the second vector!
- Finds internal repetitions in soggetti (which it reads as fugas)

Less Good:

- Longas in the score produce false positives via strings of “1, 1, 1,” that appear to be similar vectors.
- ID’s later return as 3-voice fugas

Requesting file from https://crimproject.org/mei/CRIM_Model_0015.mei...
Successfully imported.
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 83 in voice 2
- Measure 83 in voice 2
- Measure 84 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 84 in voice 1
- Measure 84 in voice 2
- Measure 84 in voice 3
- Measure 84 in voice 4
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 84 in voice 2
- Measure 84 in voice 3

- Measure 84 in voice 4
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 84 in voice 1
- Measure 84 in voice 2
- Measure 84 in voice 3
- Measure 84 in voice 4
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 84 in voice 2
- Measure 84 in voice 3
- Measure 84 in voice 4
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 163 in voice 1
- Measure 163 in voice 1
- Measure 163 in voice 1
- Measure 163 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 163 in voice 1
- Measure 163 in voice 1
- Measure 163 in voice 1
- Measure 164 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 163 in voice 1
- Measure 163 in voice 1
- Measure 164 in voice 1
- Measure 164 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 163 in voice 1
- Measure 164 in voice 1
- Measure 164 in voice 1
- Measure 164 in voice 1

Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 164 in voice 1
- Measure 164 in voice 1
- Measure 164 in voice 1
- Measure 164 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 164 in voice 1
- Measure 164 in voice 1
- Measure 164 in voice 1
- Measure 165 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 164 in voice 1
- Measure 164 in voice 1
- Measure 165 in voice 1
- Measure 165 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 164 in voice 1
- Measure 165 in voice 1
- Measure 165 in voice 1
- Measure 165 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 165 in voice 1
- Measure 165 in voice 1
- Measure 165 in voice 1
- Measure 165 in voice 1
Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 165 in voice 1
- Measure 165 in voice 1
- Measure 165 in voice 1
- Measure 166 in voice 1

Periodic Entry:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 165 in voice 1
- Measure 165 in voice 1
- Measure 166 in voice 1

Imitative Duo:
Pattern: [1, 1, -2, 2, 2, 2], Locations in entry:
- Measure 1 in voice 1
- Measure 3 in voice 2
- Measure 10 in voice 3
- Measure 12 in voice 4

Imitative Duo:
Pattern: [1, -2, 2, 2, 2, 1], Locations in entry:
- Measure 1 in voice 1
- Measure 3 in voice 2
- Measure 10 in voice 3
- Measure 12 in voice 4

Imitative Duo:
Pattern: [-2, 2, 2, 2, 1, -2], Locations in entry:
- Measure 2 in voice 1
- Measure 4 in voice 2
- Measure 11 in voice 3
- Measure 13 in voice 4

Imitative Duo:
Pattern: [2, 2, 2, 1, -2, -2], Locations in entry:
- Measure 2 in voice 1
- Measure 4 in voice 2
- Measure 11 in voice 3
- Measure 13 in voice 4

Imitative Duo:
Pattern: [-3, 2, 1, -2, -2, 2], Locations in entry:
- Measure 5 in voice 1
- Measure 7 in voice 4
- Measure 14 in voice 3
- Measure 16 in voice 2

Imitative Duo:

Pattern: [2, 1, -2, -2, 2, 2], Locations in entry:
- Measure 6 in voice 1
- Measure 8 in voice 4
- Measure 15 in voice 3
- Measure 17 in voice 2

Imitative Duo:

Pattern: [3, -2, -2, 1, -2, -3], Locations in entry:
- Measure 22 in voice 2
- Measure 24 in voice 1
- Measure 26 in voice 4
- Measure 28 in voice 3

Imitative Duo:

Pattern: [-2, -2, 1, -2, -3, 1], Locations in entry:
- Measure 23 in voice 2
- Measure 24 in voice 1
- Measure 27 in voice 4
- Measure 28 in voice 3

Imitative Duo:

Pattern: [-2, 1, -2, -3, 1, 2], Locations in entry:
- Measure 23 in voice 2
- Measure 24 in voice 1
- Measure 27 in voice 4
- Measure 28 in voice 3

Imitative Duo:

Pattern: [1, -2, -3, 1, 2, 2], Locations in entry:
- Measure 23 in voice 2
- Measure 25 in voice 1
- Measure 27 in voice 4
- Measure 29 in voice 3

Imitative Duo:

Pattern: [-2, -3, 1, 2, 2, 2], Locations in entry:
- Measure 23 in voice 2
- Measure 25 in voice 1
- Measure 27 in voice 4
- Measure 29 in voice 3

Imitative Duo:

Pattern: [1, 2, 2, 2, 1, -2], Locations in entry:
- Measure 86 in voice 1
- Measure 88 in voice 2
- Measure 91 in voice 3
- Measure 93 in voice 4

Imitative Duo:
Pattern: [4, 2, 2, -3, 3, -2], Locations in entry:
- Measure 56 in voice 2
- Measure 58 in voice 1
- Measure 61 in voice 4
- Measure 63 in voice 2

Imitative Duo:
Pattern: [4, 2, 2, -3, 3, -2], Locations in entry:
- Measure 61 in voice 4
- Measure 63 in voice 2
- Measure 64 in voice 1
- Measure 65 in voice 3

Imitative Duo:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 84 in voice 3
- Measure 84 in voice 4
- Measure 84 in voice 1
- Measure 84 in voice 2

Imitative Duo:
Pattern: [1, 1, 1, -3, 1, 2], Locations in entry:
- Measure 85 in voice 1
- Measure 87 in voice 2
- Measure 90 in voice 3
- Measure 92 in voice 4

Imitative Duo:
Pattern: [1, 1, -3, 1, 2, 2], Locations in entry:
- Measure 85 in voice 1
- Measure 87 in voice 2
- Measure 90 in voice 3
- Measure 92 in voice 4

Fuga:

Pattern: [1, -2, 2, 2, 2, 1], Locations in entry:
- Measure 3 in voice 2
- Measure 10 in voice 3
- Measure 12 in voice 4

Fuga:
Pattern: [-2, 2, 2, 2, 1, -2], Locations in entry:
- Measure 4 in voice 2
- Measure 11 in voice 3
- Measure 13 in voice 4

Fuga:
Pattern: [2, 2, 2, 1, -2, -2], Locations in entry:
- Measure 4 in voice 2
- Measure 11 in voice 3
- Measure 13 in voice 4

Fuga:
Pattern: [-3, 2, 1, -2, -2, 2], Locations in entry:
- Measure 7 in voice 4
- Measure 14 in voice 3
- Measure 16 in voice 2

Fuga:
Pattern: [2, 1, -2, -2, 1, -2], Locations in entry:
- Measure 4 in voice 2
- Measure 11 in voice 1
- Measure 13 in voice 4

Fuga:
Pattern: [-3, 1, 2, 2, 2, 1], Locations in entry:
- Measure 85 in voice 1
- Measure 87 in voice 2
- Measure 90 in voice 2

Fuga:
Pattern: [-3, 1, 2, 2, 2, 1], Locations in entry:
- Measure 87 in voice 2
- Measure 90 in voice 2
- Measure 90 in voice 3

Fuga:
Pattern: [1, -2, -2, -2, -2, 3], Locations in entry:

- Measure 45 in voice 1
- Measure 49 in voice 3
- Measure 51 in voice 4
Fuga:
Pattern: [1, -2, -2, -2, -2, 3], Locations in entry:
- Measure 49 in voice 3
- Measure 51 in voice 4
- Measure 54 in voice 4
Fuga:
Pattern: [1, -2, -2, 1, -2, 1], Locations in entry:
- Measure 45 in voice 3
- Measure 52 in voice 2
- Measure 55 in voice 1
Fuga:
Pattern: [4, 2, 2, -3, 3, -2], Locations in entry:
- Measure 58 in voice 1
- Measure 61 in voice 4
- Measure 63 in voice 2
Fuga:
Pattern: [2, 2, -3, 3, -2, -2], Locations in entry:
- Measure 57 in voice 2
- Measure 58 in voice 1
- Measure 62 in voice 4
Fuga:
Pattern: [2, 2, -3, 3, -2, -2], Locations in entry:
- Measure 58 in voice 1
- Measure 62 in voice 4
- Measure 64 in voice 1
Fuga:
Pattern: [-2, 1, -3, 2, 2, 2], Locations in entry:
- Measure 70 in voice 1
- Measure 72 in voice 3
- Measure 77 in voice 2
Fuga:
Pattern: [-2, 1, -3, 2, 2, -3], Locations in entry:
- Measure 74 in voice 3

- Measure 76 in voice 1
- Measure 80 in voice 3

Fuga:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 83 in voice 2
- Measure 84 in voice 1
- Measure 84 in voice 2

Fuga:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 84 in voice 4
- Measure 84 in voice 1
- Measure 84 in voice 2

Fuga:
Pattern: [1, 1, 1, 1, 1, 1], Locations in entry:
- Measure 165 in voice 1
- Measure 166 in voice 1
- Measure 166 in voice 2

Fuga:
Pattern: [1, -3, 1, 2, 2, 2], Locations in entry:
- Measure 85 in voice 1
- Measure 87 in voice 2
- Measure 90 in voice 2

Fuga:
Pattern: [1, -3, 1, 2, 2, 2], Locations in entry:
- Measure 87 in voice 2
- Measure 90 in voice 2
- Measure 90 in voice 3

Fuga:
Pattern: [1, 1, 3, -2, -3, 2], Locations in entry:
- Measure 110 in voice 2
- Measure 111 in voice 1
- Measure 114 in voice 4

Fuga:
Pattern: [1, 1, 3, -2, -3, 2], Locations in entry:
- Measure 111 in voice 1
- Measure 114 in voice 4

- Measure 116 in voice 3
Fuga:
Pattern: [1, 3, -2, -3, 2, 2], Locations in entry:
- Measure 111 in voice 2
- Measure 112 in voice 1
- Measure 114 in voice 4
Fuga:
Pattern: [1, 3, -2, -3, 2, 2], Locations in entry:
- Measure 112 in voice 1
- Measure 114 in voice 4
- Measure 116 in voice 3
Fuga:
Pattern: [1, -2, -2, 1, 3, 3], Locations in entry:
- Measure 126 in voice 1
- Measure 133 in voice 1
- Measure 133 in voice 2
Fuga:
Pattern: [1, -2, -2, 1, 3, 3], Locations in entry:
- Measure 133 in voice 1
- Measure 133 in voice 2
- Measure 134 in voice 3
Fuga:
Pattern: [-2, -2, 1, 3, 3, -2], Locations in entry:
- Measure 126 in voice 1
- Measure 133 in voice 1
- Measure 134 in voice 2