

Dave Soldier & Brad Garton

String Quartet #3 opus 21
with electroencephalograms or recordings

“The Essential”

after the second movement of Arnold Schoenberg's Second String Quartet

1. Sample & Hold Variation
2. Fractal Variation “Benoit meets Arnold in 5 Dimensions”
3. Fourier Transformations
4. Integral Variation
5. First Derivative Variation

June 14 2011 version

about 30 minutes

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Performance notes for “The Essential Quartet”

This piece can either be performed by a string quartet using EEG headbands that trigger previously recorded samples, or using a fifth musician as an engineer who triggers the samples. The EEG triggering is accomplished via MAX/MSP programs that Brad Garton has devised. The triggered samples are only required in the first movement, but a creative programmer can use the EEGs to trigger appropriate sounds for the other movements except for the Fractal Variation, which should be entirely live. Samples already prepared for the 1st and 3rd movement can be downloaded from my website davesoldier.com

1. *Sample & Hold*

This uses the EEGs or the prerecorded music. The sections with repeat signs are repeated at will by the players: move on when they become tedious unless you decide that tedium is actually desired. Either the EEGs or the engineer can repeat the same sections out of phase. Thus, these repeat sections can either use tracks the players have recorded previously, or one could download versions that we have already prepared.

2. *Fractal Variation*

Inspired by Benoit Mandelbrot, who passed away just before this piece was written, a fractal shows similarity and multiple scales. We took five pitches that reoccur throughout Schoenberg’s and produced a fractal pattern where the same intervals occur between each set of 5 note, every 5th note, every 25th note, and every 125th note. It should be played very quickly, and extreme changes in timbre to the taste of the performers are encouraged – do your best to make this not sound dry and predictable and to have the rapid notes sound as if they are passed from voice to voice.

3. *Fourier Transformations*

The bar graphs show each instrument’s pitches times it’s total duration times its volume. For instance if C is played for 8 beats in the 2nd movement of Schoenberg’s second, and Eb for 16 beats, and both are at the same volume, the bar is twice as high for Eb. Choose the notes at will, and use whatever sounds and effects you like, but attempt to represent them as the fractions shown, i.e., in the case above, Eb should be played twice as much as C. Don’t let it last to the point where it is tedious, unless that’s the effect you would like for your listeners. Here too, timbral changes and a thick sound are desired. Eventually, drift to your average note, which is the average of all your bars in the graph, and eventually everyone slowly slides together to the average note of the entire piece.

4. *Integral Variation*

This sums all of the pitches, and this rapidly goes beyond the range that the instruments can play, and then beyond the range of hearing. It is thus very short.

The value of the lowest note is an arbitrary constant: the reason that the cello lasts longest is that the low D is chosen as the constant, so that succeeding Ds add zeroes, and the low C makes the integral negative. Nevertheless, even starting at a very low range, the pitches inevitably climb rapidly.

5. First Derivative Variation

This uses the first derivative of each separate part. For example, if the viola plays in succession C, E, Bb below the C, the intervals are a major third up and a tritone below. If A is chosen as the pitch center, the resulting notes would be A, C# (A plus a major third), D# (A minus a tritone).

While all of the notes are from the first derivative of the original Schoenberg movement, quite a few are removed to make the piece less dense: it feels like making a sculpture of David by removing everything from the stone that isn't David.

-Brad Garton & Dave Soldier NYC April 18, 2011

String Quartet #3 "The Essential"

June 12, 2011 version

Score

after Arnold Schoenberg's 2nd Quartet, with electroencephalograms

Dave Soldier & Brad Garton

1. Sample & Hold

$\text{♩} = 70$ each repeat section is repeated at least 3 times, and more at will of 1st violinist
solo cello

Violin I

Violin II

Viola

Cello

free dynamics

mf

B

C

Vln. I

Vln. II

Vla.

Vc.

p

pp

mf

mp

tr

D

Vln. I

Vln. II

Vla.

Vc.

mf

mp

E

F

Musical score for measures 12-18. The score is for four staves: Vln. I, Vln. II, Vla., and Vc. The key signature is one flat (B-flat). The time signature changes from 6/4 to 3/4 to 4/4 to 2/4. Measure 12 starts with a dynamic of *pp*. Measure 13 has a dynamic of *pp*. Measure 14 has a dynamic of *f*. Measure 15 has a dynamic of *pp*. Measure 16 has a dynamic of *f*. Measure 17 has a dynamic of *pp*. Measure 18 has a dynamic of *f*. There are two vertical bar lines with repeat signs at the end of measures 14 and 17.

Musical score for measures 19-24. The score is for four staves: Vln. I, Vln. II, Vla., and Vc. The key signature is one flat (B-flat). The time signature changes from 2/4 to 3/4 to 4/4. Measure 19 starts with a tempo marking of $\text{♩} = 70$ and a dynamic of *mp*. Measures 19-24 feature triplets in all staves. Measure 20 has a dynamic of *mp*. Measure 21 has a dynamic of *mp*. Measure 22 has a dynamic of *mp*. Measure 23 has a dynamic of *mp*. Measure 24 has a dynamic of *mp*.

Musical score for measures 25-28. The score is for four staves: Vln. I, Vln. II, Vla., and Vc. The key signature is one flat (B-flat). The time signature is 2/4. Measure 25 starts with a tempo marking of $\text{♩} = 100$. Measure 25 has a dynamic of *ff*. Measure 26 has a dynamic of *mp*. Measure 27 has a dynamic of *mp*. Measure 28 has a dynamic of *mf*. The Vc. staff has a marking "bounce" above measure 26. There are hairpins in the Vln. I, Vln. II, and Vla. staves.

1. Sample & Hold Variation

29

Vln. I

Vln. II

Vla.

Vc.

p

G

33

Vln. I

Vln. II

Vla.

Vc.

ff

fierce rock n' roll

H

37

Vln. I

Vln. II

Vla.

Vc.

p

mf

lyric

super sul tasto

$\text{♩} = 90$

3

43 $\underline{\underline{mf}}$ very jazzy

Vln. I $\underline{\underline{mf}}$ very jazzy

Vln. II *end tasto* $\underline{\underline{mf}}$ very jazzy

Vla. *end tasto* $\underline{\underline{mf}}$ very jazzy

Vc. *pizz.* walking bass sound $\underline{\underline{mf}}$

49 $\text{♩} = 60$ Nancarrow light & bouncy

Vln. I Nancarrow light & bouncy

Vln. II Nancarrow light & bouncy

Vla. Nancarrow light & bouncy

Vc. Nancarrow light & bouncy arco

I

53

Vln. I

Vln. II

Vla.

Vc.

1. Sample & Hold Variation

53

Vln. I

Vln. II

Vla.

Vc.

J

K

L

ff

ff

ff

ff

p

p

p

legno battuto

legno battuto

legno battuto

58

Vln. I

Vln. II

Vla.

Vc.

legno battuto

pizz.

pizz.

pizz.

arco, mechanically

arco, mechanically

arco

$\text{♩} = 60$

62

Vln. I

Vln. II

Vla.

Vc.

pizz.

pizz.

pizz.

arco

arco

arco

66

Vln. I *p dolce*

Vln. II *pizz. arco dolce*

Vla. *pizz. arco p dolce*

Vc. *mf*

M

77

Vln. I *mp p*

Vln. II *mp p*

Vla. *mp p*

Vc. *mf melody expressive*

N

77

gradually to smoother texture

Vln. I *mf gradually to smoother texture*

Vln. II *mf gradually to smoother texture*

Vla. *mf gradually to smoother texture*

Vc. *mf gradually to smoother texture*

♩=100

81

Vln. I

Vln. II

Vla.

Vc.

mp

mp

f

85

Vln. I

Vln. II

Vla.

Vc.

f

f

89

Cajun

Vln. I

Vln. II

Vla.

Vc.

Cajun

Cajun

Cajun

1. Sample & Hold Variation

94

P

$\text{♩} = 116$

Vln. I

Vln. II

Vla.

Vc.

pizz.

100

Vln. I

Vln. II

Vla.

Vc.

pizz.

arco

Singtra

pizz.

arco

pizz.

arco

pizz.

107

Vln. I

Vln. II

Vla.

Vc.

arco

arco

arco

pizz.

112

Vln. I

Vln. II

Vla.

Vc. arco

Q

120

Vln. I

Vln. II

Vla.

Vc. arco

R

126

Vln. I

Vln. II

Vla.

Vc. pizz.

S

T
131

Vln. I

Vln. II

Vla.

Vc.

arco

Vln. I

Vln. II

Vla.

Vc.

sfz

mf

mf

Vln. I

Vln. II

Vla.

Vc.

1. Sample & Hold Variation

♩ = c. 108

Wayne Shorter

G.P.

146

Vln. I

Vln. II

Vla.

Vc.

stress beat 2

mp

f

stress beat 2

pizz.

Wayne Shorter

152

Vln. I

Vln. II

Vla.

Vc.

stress beat 2

sim.

159

U

W

solo cello

Vln. I

Vln. II

Vla.

Vc.

f

p *f*

espress.

X

167

Vln. I *mf*

Vln. II

Vla. *mf* gliss.

Vc. *mf*

175

Vln. I *mf*

Vln. II

Vla. *ff* *mf* gliss. *mf* *ff* *mf* arco mod., light sound again

Vc. *ff* *mf* *mf* gliss. *ff* *mf* arco mod., light sound again

182

Vln. I *ff* *f*

Vln. II *ff* *f*

Vla. *ff* *f*

Vc. *ff* *f*

187

Vln. I

Vln. II

Vla.

Vc.

192

Vln. I

Vln. II

Vla.

Vc.

pp

198

Vln. I

Vln. II

Vla.

Vc.

fff

fff

fff

fff

pizz.

pizz.

Y miserably dramatic Vienna

Z keep tempo (108)

203

Vln. I *mf*

Vln. II *arco* *mf* pizz.

Vla. *mf* arco

Vc. *mf*

208

Vln. I f sim.

Vln. II

Vla. arco

Vc.

AA 273 BB $\text{♩} = 90$

Vln. I f

Vln. II *mf*

Vla. *mf*

Vc. *mf*

218

Vln. I

Vln. II

Vla.

Vc.

222

CC

Vln. I

Vln. II

Vla.

Vc.

226

DD

thrash, nasty pont.

Vln. I

Vln. II

Vla.

Vc.

mf *ff* *mf* *f*

mf *ff* *mf* *f*

f *f*

230

Vln. I

Vln. II

Vla.

Vc.

235

Vln. I

Vln. II

Vla.

Vc.

240

Vln. I

Vln. II

Vla.

Vc.

pizz.

ff pizz.

ff pizz.

ff pizz.

ff

2. Fractal Variation: Arnold & Benoit in 5 Dimensions

2. Fractal Variation

Presto ♩=190 use sul tasto & ponticello at will: impromptu dynamics are encouraged

245

Violin I *p* *f* *pp*

Violin II *pp* arco

Viola *pp* arco

Cello *pp* *mp*

3

Vln. I *mf*

Vln. II *f*

Vla. *f*

Vc. *f*

7

Vln. I *pp*

Vln. II *pp*

Vla. *pp* *f*

Vc. *pp* *f* *mp*

Detailed description: This image shows three systems of a musical score for Violin I, Violin II, Viola, and Cello. The first system (measures 245-256) features Violin I with dynamics *p*, *f*, and *pp*; Violin II with *pp* and 'arco'; Viola with *pp* and 'arco'; and Cello with *pp* and *mp*. The second system (measures 257-260) shows Violin I with *mf*; Violin II with *f*; Viola with *f*; and Cello with *f*. The third system (measures 261-264) shows Violin I with *pp*; Violin II with *pp*; Viola with *pp* and *f*; and Cello with *pp*, *f*, and *mp*. The score includes various musical notations such as slurs, accents, and dynamic markings.

11

Vln. I

Vln. II

Vla.

Vc.

ff

mp

f

pp

15

Vln. I

Vln. II

Vla.

Vc.

f

pp

mf

pp

19

Vln. I

Vln. II

Vla.

Vc.

mp

pp

pp

f

23

Vln. I

Vln. II

Vla.

Vc.

mp

pp

Detailed description: This system contains measures 23 through 26. The first violin part (Vln. I) features a melodic line with a dynamic marking of *mp* at the start of measure 26. The second violin part (Vln. II) plays a similar melodic line. The viola part (Vla.) has a rhythmic accompaniment of eighth notes with a dynamic marking of *pp* at the end of measure 26. The cello part (Vc.) provides a harmonic foundation with long, sustained notes.

27

Vln. I

Vln. II

Vla.

Vc.

f

Detailed description: This system contains measures 27 through 30. The first violin part (Vln. I) has a dynamic marking of *f* in measure 28 and features a more active melodic line. The second violin part (Vln. II) continues with a melodic line. The viola part (Vla.) has a rhythmic accompaniment of eighth notes. The cello part (Vc.) continues with long, sustained notes.

31

Vln. I

Vln. II

Vla.

Vc.

pp

mf

mf

Detailed description: This system contains measures 31 through 34. The first violin part (Vln. I) has a dynamic marking of *pp* in measure 32. The second violin part (Vln. II) has a dynamic marking of *mf* in measure 32. The viola part (Vla.) has a dynamic marking of *mf* in measure 32 and features a rhythmic accompaniment of eighth notes. The cello part (Vc.) has a dynamic marking of *mf* in measure 32 and features a rhythmic accompaniment of eighth notes.

35

Vln. I

Vln. II

Vla.

Vc.

p

pp

mf

39

Vln. I

Vln. II

Vla.

Vc.

ff

ppp

ppp

ff

ppp

43

Vln. I

Vln. II

Vla.

Vc.

47

Vln. I

Vln. II

Vla.

Vc.

pp

ff

51

Vln. I

Vln. II

Vla.

Vc.

f

pp

f

55

Vln. I

Vln. II

Vla.

Vc.

f

59

Vln. I

Vln. II

Vla.

Vc.

62

Vln. I

Vln. II

Vla.

Vc.

ff pizz.

ff pizz.

ff pizz.

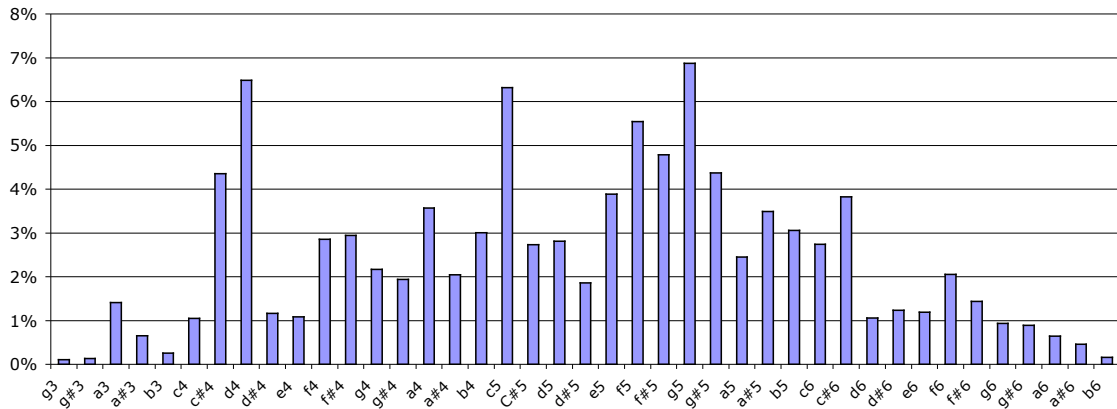
ff

3. Fourier Transformations

April 20, 2011 version

from the Essential String Quartet

VIOLIN 1 PART



Bars indicate the power (duration * volume) for each pitch in the original Schoenberg piece. C4 is middle C.

Play the amount of each pitch represented (for example, D above middle C, C above middle C, and G on top line of treble clef should be played the twice as much as notes that are around 3%). You can use double stops, different tones, and rhythms at will, but try to make a sustained sound with the entire group.

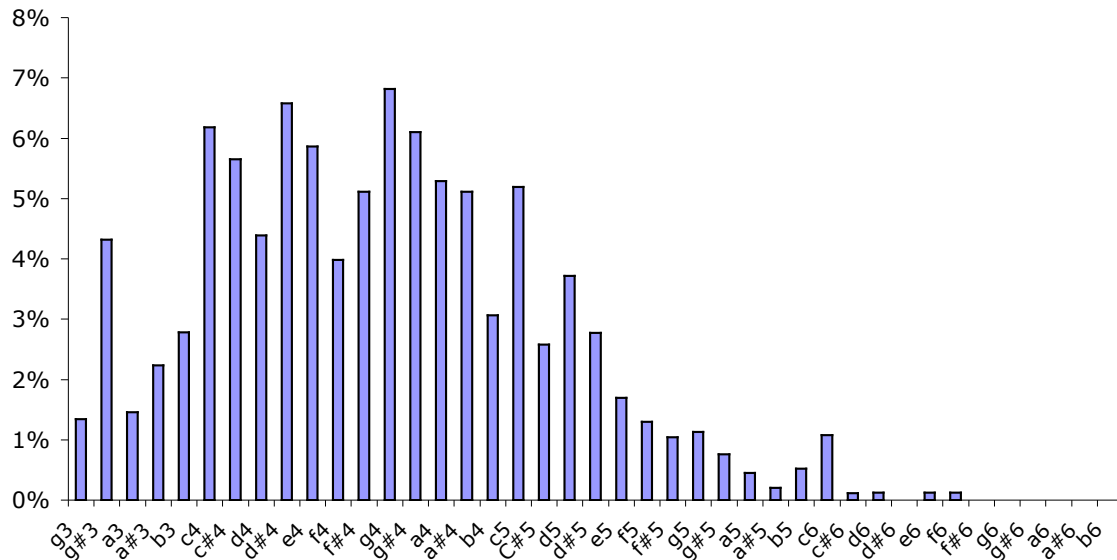
At cue 1, take 30-40 sec to slowly move the pitches closer to your average note: e5.1 (the open E string plus a tiny bit sharp)

At cue 2, take 30-40 sec to slowly move \ to the average note of the entire piece: e4.8, which is the e above middle C very sharp (almost F).

3. Fourier Transformations

April 20, 2011 version

VIOLIN 2 PART



Bars indicate the power (duration * volume) for each pitch in the original Schoenberg piece. C4 is middle C.

Play the amount of each pitch represented (for example, D above middle C, G above middle C should be played the most. You can use double stops, different tones, and rhythms at will, but try to make a sustained sound with the entire group.

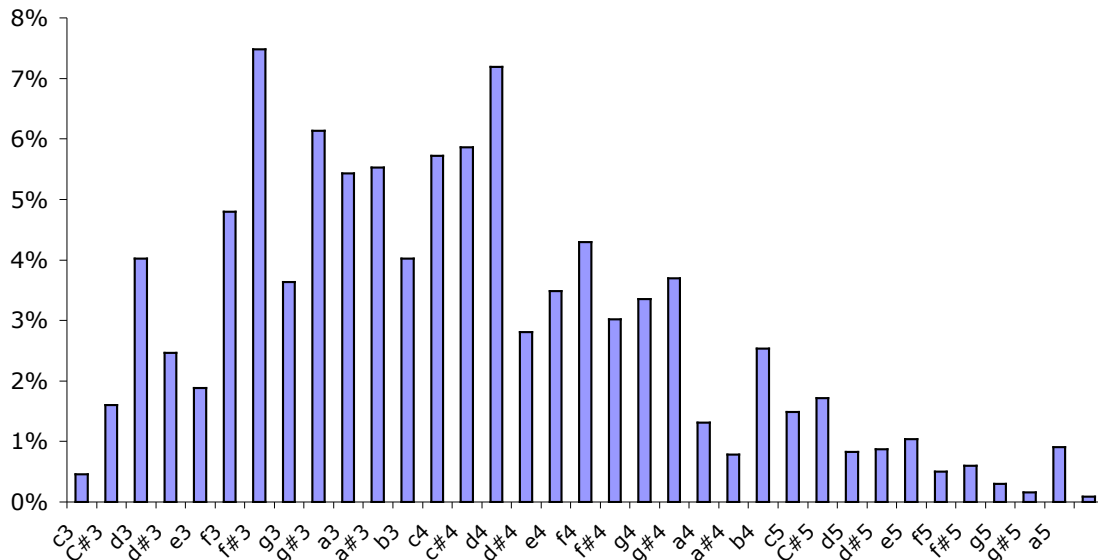
At cue 1, take 30-40 sec to slowly move the pitches closer to your average note: G#4.1 (G# below the A string a tiny bit sharp).

At cue 2, take 30-40 sec to slowly move \ to the average note of the entire piece: e4.8, which is the e above middle C very sharp (almost F).

3. Fourier Transformations

April 20, 2011 version

VIOLA PART



Bars indicate the power (duration * volume) for each pitch in the original Schoenberg piece. C4 is middle C.

Play the amount of each pitch represented (for example, F# below middle C is the loudest and most played, followed by the D above middle C). You can use double stops, different tones, and rhythms at will, but try to make a sustained sound with the entire group.

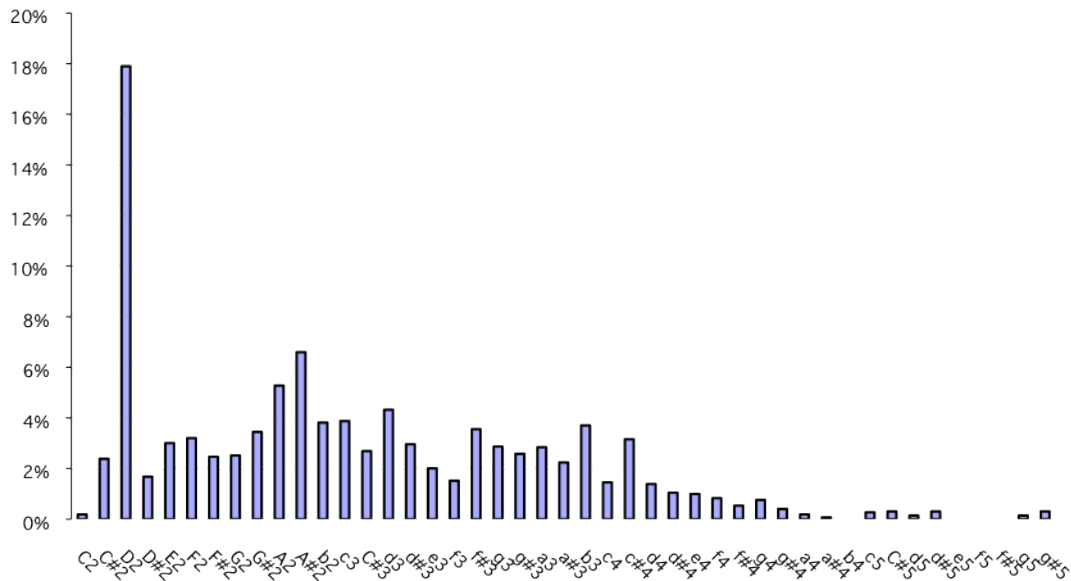
At cue 1, take 30-40 sec to slowly move the pitches closer to your average note: C#4.5, which is the C# above middle C plus a quarter tone.

At cue 2, take 30-40 sec to slowly move \ to the average note of the entire piece: e4.8, which is the e above middle C very sharp (almost F).

3. Fourier Transformations

April 20, 2011 version

CELLO PART



Bars indicate the power (duration * volume) for each pitch in the original Schoenberg piece. C4 is middle C.

Play the amount of each pitch represented (for example, D above middle C, C above middle C, and G on top line of treble clef should be played the twice as much as notes that are around 3%). You can use double stops, different tones, and rhythms at will, but try to make a sustained sound with the entire group.

At cue 1, take 30-40 sec to slowly move the pitches closer to your average note: D3.3, which is the open D string plus a 3rd tone sharp.

At cue 2, take 30-40 sec to slowly move \ to the average note of the entire piece: e4.8, which is the e above middle C very sharp (almost F).

4. Integral Variation

4. Integral Variation

64 $\text{♩} = 116$ scherzo

This musical score is for the piece "4. Integral Variation" in 4/4 time, marked "scherzo" with a tempo of 116 beats per minute. The score is divided into three systems, each starting with a measure number (64, 5, and 9 respectively).

System 1 (Measures 64-67): The Violin I and II parts are mostly silent. The Viola and Cello parts enter with a melodic line in the right hand and a bass line in the left hand. The dynamic is *mf*. The key signature has one flat (B-flat).

System 2 (Measures 5-8): The Violin I part has a melodic line with a dynamic of *mf*. The Violin II part has a short melodic phrase marked *8va-1*. The Viola part has a melodic line with a dynamic of *mf*. The Cello part has a bass line. The dynamic is *mf*.

System 3 (Measures 9-11): The Violin I, II, and Viola parts are silent. The Cello part has a melodic line in the right hand and a bass line in the left hand. The dynamic is *pizz.* (pizzicato). The key signature changes to two flats (B-flat and E-flat).

5. First Derivative Variation

5. First Derivative Variation

12 $\text{♩} = 116$

Violin I

Violin II

Viola

Cello

arco
leggiero

pp
arco

pp
leggiero

pp

Vln. I

Vln. II

Vla.

Vc.

arco

p

mf *cresc.*

mf *cresc.*

mf *fresc.*

mf

cresc.

$\text{♩} = 70$

mp

Vln. I

Vln. II

Vla.

Vc.

mp

mp

mp

34

Vln. I

Vln. II

Vla.

Vc.

mf

38

Vln. I

Vln. II

Vla.

Vc.

43

Vln. I

Vln. II

Vla.

Vc.

48

Vln. I

Vln. II

Vla.

Vc.

p *mp* *mp* *p*

Detailed description: This system of music covers measures 48 to 52. It features four staves: Violin I, Violin II, Viola, and Violoncello. The Violin I staff is mostly silent with a few notes in measure 52. The Violin II staff begins with a piano (*p*) dynamic and moves to mezzo-piano (*mp*) by measure 52. The Viola staff also starts piano and moves to mezzo-piano. The Violoncello staff plays a continuous melodic line with a piano (*p*) dynamic throughout.

53

Vln. I

Vln. II

Vla.

Vc.

mp

Detailed description: This system covers measures 53 to 56. The Violin I staff starts at mezzo-piano (*mp*) and features a melodic line with various articulations. The Violin II staff plays a similar melodic line. The Viola staff has a more rhythmic accompaniment. The Violoncello staff continues with a steady melodic line.

57

Vln. I

Vln. II

Vla.

Vc.

pp *pp* *pp* *pp*

Detailed description: This system covers measures 57 to 60. The dynamics for all instruments are marked piano-piano (*pp*). The Violin I and II staves play melodic lines with some sustained notes. The Viola and Violoncello staves provide harmonic support with sustained chords and moving lines.

87

Vln. I pizz. arco

Vln. II pizz. arco

Vla. pizz.

Vc. pizz. arco

mf

94

Vln. I

Vln. II

Vla. arco

Vc. arco

mf *mp*

100

Vln. I

Vln. II

Vla. pizz. arco

Vc. pizz.

mf *mp*

107

Vln. I

Vln. II

Vla.

Vc.

f

114

Vln. I

Vln. II

Vla.

Vc.

f pizz. arco

f pizz.

pizz.

120

Vln. I

Vln. II

Vla.

Vc.

mf

mfco

f

5. First Derivative

126

$\text{♩} = 116$
pizz.

Vln. I *ff* *mf*

Vln. II *ff* *mf*

Vla. 3

Vc. 3 pizz. *mf*

133

Vln. I

Vln. II

Vla.

Vc.

141

arco

Vln. I *mf* *mp*

Vln. II arco *mp*

Vla.

Vc.

$\text{♩} = 80$

arco

mp

mp

mp

mp

Musical score for measures 150-156. The score is in 4/4 time and features four staves: Vln. I, Vln. II, Vla., and Vc. The key signature has one flat. Measure 150 starts with a dynamic of *p*. A crescendo line spans from measure 151 to 156, ending at a dynamic of *f*. From measure 153, all instruments play *arco* with a dynamic of *mp*. The Vln. I part has a fermata over the final measure (156).

Musical score for measures 157-162. The score is in 4/4 time and features four staves: Vln. I, Vln. II, Vla., and Vc. The key signature has one flat. Measure 157 starts with a dynamic of *f*. The Vln. I part has a fermata over the final measure (162). The Vln. II part has a dynamic of *f* in measure 162. The Vla. and Vc. parts have dynamics of *f* and *<f* respectively in measure 162.

Musical score for measures 163-168. The score is in 4/4 time and features four staves: Vln. I, Vln. II, Vla., and Vc. The key signature has one flat. Measure 163 starts with a dynamic of *f*. The Vln. I part has a fermata over the final measure (168). The Vln. II, Vla., and Vc. parts have dynamics of *f*, *f*, and *f* respectively in measure 168.

168

Vln. I

Vln. II

Vla.

Vc.

173

Vln. I

Vln. II

Vla.

Vc.

ff a bit of nasty ponticello

some accel. to end

178

Vln. I

Vln. II

Vla.

Vc.

183

Vln. I

Vln. II

Vla.

Vc.

Detailed description: This system of music covers measures 183 to 187. It features four staves: Violin I, Violin II, Viola, and Violoncello. The key signature has one flat (B-flat). The time signature is 4/4. Measures 183-185 show active, rhythmic patterns in all parts. In measure 186, the Violin II and Viola parts have rests, while the Violin I and Violoncello parts continue. In measure 187, all parts have rests.

188

pizz.

Vln. I

Vln. II

Vla.

Vc.

Detailed description: This system of music covers measures 188 and 189. The Violin I, Violin II, and Viola parts have rests in measure 188. In measure 189, each of these three parts has a single eighth note marked 'pizz.' (pizzicato). The Violoncello part has a long note in measure 188 and a single eighth note in measure 189. A double bar line with repeat dots is present at the end of measure 189.