

# Computer Music from Carnegie Mellon

Works by students of Introduction to Computer Music, spring 2009

Dr. Roger B. Dannenberg, instructor

Robert Chen, teaching assistant

Dipanjan Das, teaching assistant

Matt Stanton, teaching assistant

## TITLE AND COMPOSER

Untitled .....	Michael Soto	000_msg.mp3
Kitten-Gobbling Belugas .....	David Wang	0000_djwang.mp3
Explorations of Randomness .....	Andrew McGuier	0001_amcguier.mp3
Bells In The Woods .....	Brett Simmers	0002_bsimmers.mp3
Carnival .....	Christopher T. Niessl	0003_cniessl.mp3
SHOWS .....	Soojin Jeong	0004_soojinj.mp3
Golden Triangle .....	Nicholas Brockmeyer	0005_nbrockme.mp3
Hocket Thing .....	Ben Harris	0006_bgharris.mp3
The Peaceful Coexistence .....	Eric Seo	0007_eseo.mp3
From the Rain.....	Valeria Reznitskaya	0008_vreznits.mp3
Show and Tell .....	Adam Lederer	0009_alederer.mp3
Early Morning, Moorestown Apartments, Hecatre, CA .....	Felix Park	0010_fpark.mp3
Prelude for Solo Computer .....	Stefan J. Sullivan	0011_ssulliva.mp3
Sound .....	Amandianeze O. Nwana	0012_aon.mp3
Time for Individual Action.....	Miriam Cha	0013_mcha.mp3
Epiphany .....	Adrian Chow	0014_ahchow.mp3
Untitled .....	Jeffrey Feldman	0015_jbf.mp3
Dungeons of the Mind.....	Mohammed K. Rahman	0016_mkrahman.mp3
Frogs in the Cave .....	Mun Thye Mak	0017_munthyem.mp3
Bog .....	Dan Schultz	0018_dschultz.mp3
Creeper .....	Clara Kang	0019_ckang.mp3
The Drums .....	Sarah Miles	0020_smiles.mp3
A Life Cycle .....	Danny Alvarez	0021_dalvarz.mp3
Duelality .....	Andrew Farrar	0022_afarrar.mp3
Fugue .....	Gregory Williams	0023_gswillia.mp3

Confusion within Method .....	Siddharth Jain	0024_sjain1.mp3
Choral Piece for Organ No. 1 .....	Joseph Winwood	0025_jwinwood.mp3
Ethereal Journey.....	Eric W. Barndollar	0026_ebarndol.mp3
Basketball Game .....	Saurabh C. Sanghvi	0027_scsanghv.mp3
Collage .....	Chong-Oak Lee	0028_chongoal.mp3
Dabrota i zlo .....	Ryan McCulloch	0029_rmccullo.mp3
Sonic Echo .....	Dmitry Portnoy	0030_dportnoy.mp3
Parallelism .....	Dan Lackerv	0031_dlacker.mp3
The Attack of Aliens .....	Brian Pak	0032_bpak.mp3
A Modern Band.....	Aaron Daniele	0033_adaniele.mp3
Four of a Kind .....	Jeff Carlson	0034_jwcarlso.mp3
Man'slaughter .....	James Forbes	0035_jfforbes.mp3
Gumby .....	Nikola Ljuboja	0036_nljuboja.mp3
Calvino .....	Rushikesh Sheth	0037_rksheth.mp3
Composition .....	Robert Saris	0038_rsaris.mp3
Ominous Glow .....	Samir Singh	0039_samirsin.mp3
Laura .....	Si Cai	0040_scai.mp3
Wow whoa .....	Seth Lisboa	0041_slisboa.mp3
Titanium Dream .....	Tye Wang	0042_tianyuan.mp3
Fine Tuning.....	Vini Oommen	0043_voommen.mp3

## PROGRAM NOTES

### ***Composition – Michael Soto***

[000\_mgs.mp3]

My piece was influenced from a movie made by a friend of mine. The movie focused on someone suffering from a nightmare. The overall emotion I tried to convey is general confusion that ultimately leads to the person waking up and still in the nightmare. I used sound clips from a sleep hypnosis tape and used varying styles of granular synthesis. Score generators were used to perform the syncopated tones and the accumulator at the end. I used multi-channeling to heighten the sense of confusion. I found a sound byte on freesound.org called "Nine lies the heart 4" as the background tone to heighten the eerie feeling. Extensive use of Audacity was used to piece it all together.

I am a junior ECE major. I have a slight musical background having played piano for many years. I am observant and often critical of everything around me. I enjoy social scenes.

### ***Kitten-Gobbling Belugas – David Wang***

[0000\_djwang.mp3]

This is a concept piece about a kitten being viciously ingested by a ferocious beluga whale. It heavily relies on speech and sound samples taken of my friends and the techniques of granular synthesis and FM instruments. I used Nyquist to generate the basic sounds and Audacity to add effects and put everything together.

I am a junior ECE major, minoring in CS and music theory. I enjoy listening to progressive rock, photography, and taking things apart, and especially all three at the same time.

### ***Explorations of Randomness – Andrew McGuier***

[0001\_amcguier.mp3]

My piece was created with the aim of extending the themes that interested me during the computer music course. I was particularly interested with randomness and what types of sounds I could generate using random sounds. It was built with multiple simple voices none particularly interesting but hopefully arranged in

such a way to catch the ear. I opted to avoid the use of any natural sounds in the hopes of exploring what could be done with the computer as a sole tool of composition.

Andrew McGuier is a senior Computer Science major minoring in Chemistry. He is a former saxophonist and singer who frequently regrets his decision not to pursue music at Carnegie Mellon although he still sings when he thinks no one is listening. His interests beyond music are photography, farming, running, and driving/automotive although he would hate to be limited to any particular box.

### ***Bells In The Woods – Brett Simmers***

[0002\_bsimmers.mp3]

My piece is loosely based around a series of bell-like objects ringing in the woods, with birds and a constant soft wind in the background. It combines and contrasts synthesized noises with noises sampled from real life. The synthesized sounds are created with fm synthesis and introduced by evolving them from the basics, which creates some interesting noises. It was composed entirely within Nyquist, and the real-life sound samples were downloaded from freesound.org.

Brett is a Computer Science major, and he has been playing musical instruments and programming for much of his life. When creating computer music he tends to focus more on creating interesting sounds as opposed to traditional musical ideas and forms, since that is the most intriguing aspect of creating music with computers. His interests include playing and listening to music, programming, riding his bike, and many other fun things. He is from Medfield, MA.

### ***Carnival – Christopher T. Niessl***

[0003\_cniessl.mp3]

This piece was inspired and constructed during Spring Carnival Reunion on Carnegie Mellon Campus April 16th to 18th, 2009. The piece samples ambient crowd and construction noises, designed to reflect the amount of effort that goes into preparing the midway site, and the general atmosphere on the Midway. It also

arranges these samples in four movements: an initial midway construction phase, the first night of opening, the deserted fairgrounds after the first day, and the surreal atmosphere following the next day. The main instruments however, including the ambient noise in the beginning, and the organ and bass throughout the piece, were completely constructed and synthesized from scratch.

Chris is currently a junior CS/EPP major, focusing on the applications of distributed systems and networks and their use for transporting multimedia. He's currently plays bass in a jam band, and DJs house music for local parties. His musical influences include Aphex Twin, Les Claypool of Primus, Ministry, Trent Reznor, and VNV Nation.

### ***SHOWS – Soojin Jeong***

[0004\_soojinj.mp3]

This piece was to represent all the TV shows that I love. Many components represent the core image of different shows from my perspective. I used different techniques from class such as fm sound, piano synthesis, and envelopes.

Soojin is a CS major minoring in Chemistry. In music, I look for structures and forms and that's why I like classical era the most. Although this class was learning about the type of music that is far from what I like, I think it was cool to view the new side of music.

### ***Golden Triangle – Nicholas Brockmeyer***

[0005\_nbrockme.mp3]

My piece represents a combination of unique patterns and repetition. Very small modifications are made to an initial set of sounds to create essentially the entire piece. As such the entire piece was made possible with FM Modulation with small additions from envelopes, reverberations, and other facets to help add character to the piece.

One goal of my piece is to include repetition while having the piece as a whole remain mysterious. As you listen try to find where the repetition is.

Nicholas is an ECE and CS major graduating this may 2009. I consider myself to be adept at discerning patterns, and as such I include many in my works. I enjoy most kinds of music, but my

love will always be focused on instrumental pieces. Other interests include reading, cooking, and other electronic pursuits.

### ***Hocket Thing – Ben Harris***

[0006\_bgharris.mp3]

This piece explores timbral manipulations derived from the technique of hocketing. This is a rhythmic, linear technique in which multiple parts operate to create a combined whole. I wrote out the piece for three violins and recorded each part separately. The recorded sound amounts to about a minute of music. I then used techniques in Nyquist to manipulate and extend the work into its present form. These techniques include FFT synthesis, granular synthesis, filtering, and algorithmic generation. I assembled the work in Audacity.

Ben is a graduate student in Music composition at the University of Pittsburgh. He plays the violin and viola, and he is currently working on a dissertation on the string quartets of Giacinto Scelsi.

### ***The Peaceful Coexistence – Eric Seo***

[0007\_eseo.mp3]

I tried to combine modern feeling of sound with traditional string and wind instrument sounds in a very peaceful way. All sounds are generated by Nyquist, using FM instrument behavior, sound modulation, filtering, envelopes, and many other techniques. Mainly, the sound was generated by passing FM instrument behavior sound through filters. Although sound units are all generated by Nyquist, I used Audacity to combine them into one piece.

Eric Seo is a Computer Science major, double-majoring in Mathematical Science. He likes listening to modern rock and jazz piano songs, but still enjoys all other music genres. Other than music, He is interested in sports, internet games and so forth.

### ***From the Rain – Valeria Reznitskaya***

[0008\_vreznits.mp3]

My piece tells the story of a traveler who happens upon an old, broken church while searching for shelter from the rain. It had been storming on and off all day, and she wanders into

the church right before the start of a downpour. The church has not been used in years, and some rain makes it through the holes in the ceiling. Nevertheless, the traveler is intrigued by the building and decides to explore her surroundings. The sounds for the piece were mostly generated in Nyquist using FM synthesis and resonance filters, but natural sounds of wind and rain were also taken from the Internet and modified with granular synthesis. The final piece was assembled in Audacity.

Valeria Reznitskaya is a Computer Science major minoring in Japanese. He likes to listen to various kinds of music and has no preference for genre. His hobbies include writing, drawing and making video games in my spare time.

***Show and Tell – Adam Lederer***

[0009\_alederer.mp3]

I composed this to highlight two of my favorite computer music techniques: FM synthesis and sampling synthesis. All of the textures were created using either frequency modulation or PCM data from multisample libraries. The composition's loosely based around a very short motif that goes like "da da da da daa".

Besides being a dedicated composer and sound designer, Adam is an ECE/CS double major and a game designer from northern Virginia.

***Early Morning, Moorestown Apartments, Hecatre, CA – Felix Park***

[0010\_fpark.mp3]

This piece is a mixture: both of prose and music. An easy comparison here is to the many spoken word compositions out there, which I both admire and took inspiration from. The format is attractive – I make my main studies as a writer of fiction, and the opportunity to convey it in this way is exciting. Here is the story of someone, could be a friend, a relative or a stranger. In the early morning hours he tells you about his life, his thoughts. The music forms a background, a context for his feelings and emotions. All and all it is incredibly minimal – much like most of the reflection, if any, that goes on in our hearts and minds.

Felix is a creative Writing/Professional Writing major with a minor in Computer Science.

I am incredibly interested in the storytelling abilities of music, and the many wonderful and sometimes abstract ways it can accomplish it, as I hope to have achieved with this piece.

***Prelude for Solo Computer – Stefan J. Sullivan***

[0011\_ssulliva.mp3]

This piece uses FM synthesis, granular synthesis and comb filters to create an environment in a new language. It uses diatonic and pentatonic structures with aleatoric rhythms to create an atonal progressive of tension, which is resolved in the same language. Enjoy the utilization of all 8 speakers.

Stefan Sullivan is in his 5th year at CMU as a student in ECE and Music. He has studied composition under Nancy Galbraith and Efrain Amaya and briefly under Leonardo Balada. Much of his musical style can be explained by his affinity for romantic composers such as Richard Wagner and minimalist composers such as Steve Reich.

***Sound – Amandianeze O. Nwana***

[0012\_aon.mp3]

This is jazzy piece in Dorian mode with randomization. The melodic contours and rhythm are based on some fine-tuned Markov models. Past that, the solos always rise to the dominant--the piece is intended to be played at least twice in succession to get the full effect of the wrapping resolution. It's an "Endlessly Rising Canon" for computer.

I am a junior in ECE with an additional major in CS. I am from Avenel, New Jersey.

***Time for Individual Action – Miriam Cha***

[0013\_mcha.mp3]

The intention of this piece was to make a sound of human, animal, and nature. When I was composing the score for this project, I was primarily thinking of global warming. Global warming is the increase in the average temperature of the Earth's near-surface air and oceans since the mid-twentieth century and its projected continuation. Too often people only look for close and apparent problems and miss out much bigger disasters that are coming.

In this composition, I was trying to picture the consequence of global warming.

- First: The beginning of this score is the reaction of animals. In general, animals have much more sensitive to the change of climates, natural disasters, and temperature change.

This section pictures animals migrating to safer place to avoid the coming disaster.

- Second: Finally, in this section the consequence of the global disaster is becoming apparent to humans

- Third: Humans are panicing and discussing what to do.

- Forth: Humans learned their lesson and changed their daily life style to more earth-friendly

- Fifth: Happy Ending =).

### ***Epiphany – Adrian Chow***

[0014\_ahchow.mp3]

This piece aims to tell a story of a man who makes an inner journey through retrospection in search of an answer to life. The first section of the piece is very rhythmic, trying to portray the dynamics and complexity of our daily lives. He journeys and eventually is able to block off earthly distractions. In the quiet part, he comes across interesting ideas that bounce off one another. Eventually, he thinks he has found what he was searching for. Little does he know this isn't the answer he had been searching for. His soul turns into chaos, portrayed by the random piano note and the pouring rain effect. He struggles to calm himself between chaotic moments, represented by the gong sound. He is, in the end, able to calm his soul and find what he is searching for, the moment of epiphany. As he ends his journey, the thought circles around his head, shortly before entering back into the business of the world. However, he has triumphed in searching for his answer to life.

Adrian Chow is a sophomore in computer science. He has over 14 years of experience on the piano. Adrian is very interested in modern music that attempts to convey or tell a story. Very similar to the imagery used in poetry and sci-fi short stories, a piece of modern music should be able to generate these images. In his piece,

Epiphany, Adrian tried to use different effects and contrasts to highlight the story he is trying to tell.

### ***Untitled – Jeffrey Feldman***

[0015\_jbf.mp3]

This piece was designed as an interpretation of the way that people's lives tend to parallel each other's. People may have completely different experiences, but ultimately, end up in very similar situations. The piece relies heavily on a recurring motif, but also incorporates a few different "random" runs which symbolize different people and how they interact with the same recurring motif. The piece ends with the motif "swirling" around the listeners head. This is most effective with headphones as the different harmonics of the sound "chase" each other around the pan. This piece relied heavily on ProTools and Nyquist randomizing and cycles.

Jeffrey is a CS major from San Diego, CA minoring in Drama and Language technologies. Recent experiences have made me think more and more about how similar people's lives are. He is interested in a wide variety of activities, ranging from glass-blowing to fencing.

### ***Dungeons of the Mind – Mohammed K.***

**Rahman**

[0016\_mkrahman.mp3]

My piece was designed to describe a dark fictional ambience inside a person's mind. It is meant to provide a disturbing feel with various twists. It involves sampling of various sounds including vocals, thunder, and waves. I used techniques such as envelopes, granular synthesis, sampling, algorithmic composition, filters, and sound modulation.

I am a Computer Science major, minoring in Business Administration. I have a keen interest in Electronic Dance Music styles such as Trance and House. I am from Qatar in the Middle East and consider DJing as a keen hobby.

### ***Frogs in the Cave – Mun Thye Mak***

[0017\_munthyem.mp3]

Frogs, everywhere! All in a cave! With a magical gong! Near a river running through! A day in the life of a mystical group of frogs that live in a cave with a magical gong next to the

river that runs through; that is the picture that this piece is attempting to paint. This piece features the frog voice created with FM synthesis, the gong sound from AM synthesis, a water soundscape created with granular synthesis, and three different equal temperament tuning systems (5-TET, 7-TET, and 12-TET). The sounds are generated from Nyquist/SAL and are assembled in FL Studio with reverberation added to simulate the largeness of the cave in which it all takes place.

Mun Thye is a dizi/xiao player for 15 years, and has recently branched out into the Western music scene as a flute/clarinet/saxophone/ocarina player. He is currently a senior majoring in computer science, and will be working for a research institute in Singapore on machine learning when he graduates. He aspires to combine both traditional Chinese and Western music some day, and sees computer music as a means of achieving this goal.

### ***Bog – Dan Schultz***

[0018\_dschultz.mp3]

This piece was constructed using sounds formed with granular synthesis and FM synthesis. The sample used for granular synthesis was a single tone from my electric bass.

Dan Schultz is an Information Systems major from Elkins Park, Pennsylvania. He will be graduating this May with minors in Computer Science and Mathematical Sciences.

### ***Creeper – Clara Kang***

[0019\_ckang.mp3]

My piece was motivated by the action of someone creeping around a room. I tried to keep the suspense high throughout the piece, and I attempted to create an abrupt ending, no romantic fade outs. I mainly used envelopes, piano sounds, sound modulation, and harmonics.

Clara Kang is a Technical Writing and Communications major with a minor in Computer Science. She is a recreational musician and enjoys listening to all genres of music.

### ***The Drums – Sarah Miles***

[0020\_smiles.mp3]

For this composition, I tried to rely exclusively on random pitch/rhythm choices,

which meant running the code I wrote multiple times to find parts I liked. I started working with the piano instrument built into Nyquist, overlapping all of the produced sounds to get one piano tone to play in the background.

For my bass line, I just decided to use the same two pitches, because there was enough going on with the cello and piano instruments.

Originally, I planned to have the piano part play out much more than it does, but it became too chaotic (although I was shooting for a bit of chaos.) So, I cut it back and added some fade in/fade out effects in Audacity.

I used Audacity to combine the different sound files, along with adding some fading to help mask clicking and to provide some variety. Everything else was completed in Nyquist.

As a freshman in college, Sarah began learning to play steelpans (more commonly called steel drums.) She fell in love with their tone, so she wrote a piece around the instrument she started on, the cello drums. Her piece heavily utilizes random rhythm and pitch generation for cello drums and piano notes, with a few notes from the bass pans added in. She also used Audacity to control envelopes.

### ***A Life Cycle – Danny Alvarez***

[0021\_dalvarez.mp3]

My piece attempts to convey a life cycle - from birth to death - of a person. The various pieces and sound clips I used were all chosen purposefully to convey the feeling of that "phase of life." The various phases were birth, then somewhat later comes childhood which is simply happiness. Following all too quickly however is a learning phase where the subject is hit by a droning of knowledge, which is riddled with certain memorable points from their education. Next, the big world comes into play with its horns and busy streets, signs of industry and the night life. Finally, a peaceful start to old age is interrupted by failing health and ultimately a passing away. Although Audacity was used to great effect in my piece, I used other techniques like granular synthesis, envelopes, and fading.

Danny is an Information Systems major, minoring in CS. If he is not working or studying, he tends to become pensive about life and its

meaning. He likes most styles of music including alternative rock, techno, classical, and foreign. His interests include programming, reading, soccer and tennis.

***Duelality* – Andrew Farrar**

[0022\_afarrar.mp3]

I think of this piece as a fight between dissonant "chaos" and more traditional sounding "order." At the beginning there are hints of what is to come with the various themes that move around the listener. Then suddenly we are plunged into a word of dissonance and tension with the strike of a loud beating chord. This eventually gives way to a brighter, fugue-like theme. At the end the "chaos" again lurches forth in the throbbing, pulsing sounds trying to push the arpeggios out of the way. "Order" triumphs however, as the piece ends with a cadence in d minor culminating in a D major chord or Picardy third (for emphasis).

Andrew is a sophomore Mathematics major also working on a minor in Music Theory. He plays the cello with several groups on campus as well as in a few local handball ensembles. Though he is certainly a fan of popular music, he also thoroughly enjoys classical music. Some of his favorite composers include: Mozart, Morricone, Glass, Elgar, Prokofiev, Villa-Lobos and Tan Dun.

***Fugue* – Gregory Williams**

[0023\_gswillia.mp3]

My piece is comprised of multiple voices that play simultaneously in different frequency ranges. The voices were generated randomly using very general rules but still manage to overlap in interesting ways. Sometimes the voices sound as if they are competing to be heard, while other times they sound like they are cooperating or playing unison. I created the initial sound and modified its duration, pitch, and dynamic range to create each individual voice. This was created entirely in Nyquist.

Gregory is a Computer Science major with a minor in Music Technology. He enjoys listening to classical music, rock, and blues. His interests include piano and tennis, and he is from Hollywood, FL.

***Confusion within Method* – Siddharth Jain**

[0024\_sjain1.mp3]

In India, classical music is driven by improvisations along a set of notes. This forms a basis for the artist to create his music randomly. This piece portrays three of my favorite instruments: the guitar, the saxophone and the drums. The computer is given complete freedom to improvise with these instruments. The chaotic nature of today's society is further exemplified by the voices from daily random radio signals. Overall the effect is of confusion within method.

I am majoring in Computer Science and will be graduating this year along with a minor in Business. I love new experiences and am always on the lookout for fresh music. I am a die-hard fan of classic rock who indulges in house music. Being from India, I love to see a clash of cultures in fusion music.

***Choral Piece for Organ No. 1* – Joseph Winwood**

[0025\_jwinwood.mp3]

This piece is a mixture of classical composition techniques in choral and organ music. It is a three part choral piece, written in SAT format. The bass line is a drone, while the tenor line provides the chord structure in a repeating pattern. The soprano line is the movement of the piece. The composition is played with organ tones. The piece, approximately 2:47 in length is then played again with granular synthesis applied which shows off the unique harmonics of the piece.

Joseph Winwood is a senior in Discrete Mathematics and Logic. In his spare time he plays pipe organ, piano, oboe, clarinet, string bass and violin. Trained in classical technique, he enjoys playing mostly Bach and Mozart.

***Ethereal Journey* – Eric W. Barndollar**

[0026\_ebarndol.mp3]

To create this piece, I used algorithmic procedures to generate the initial material. The work opens with a series of chords that alternate between tension and repose; transpositions of these chords come back periodically throughout the composition. I relied heavily on aleatoric selection of pitches and rhythms from patterns.

Most of the piano part was improvised, and some of the percussion parts were generated from rhythmic cells. I offset these cells in different voices to create a contrapuntal groove. I think the piece achieves a nice balance of rhythmic, procedural material with free, whimsical elements. The sounds used come primarily from VST instruments (generally known as virtual instruments), which I am adding Nyquist support as my final project. The title *Ethereal Journey* was conceived after composition, and it simply represents the impression I'm left with after listening.

Eric is a dual degree student in CS and Music Composition and is from Miami, FL. He is very interested in using technology to aid in the composition, performance, and recording of music, and he plans to pursue a career in film scoring.

### ***Basketball Game* – Saurabh C. Sanghvi**

[0027\_scsanghv.mp3]

The purpose of this composition was to represent a sports game and specifically a basketball game. A basketball game has 4 quarters and my goal was to create a composition of 4 parts. The beginning of this piece starts with crowd noise, created with granular synthesis and an instrument created with reverb to represent the pregame. I created a whistle sound, granular synthesis to transition to the actual playing of the game.

Throughout the piece I wanted to have a beat that was created by granular synthesis and a combination of envelopes and modulation of basketball dribbling sounds. This beat is played throughout the piece.

Moving to the first quarter and second quarter I wanted to play a series of sounds representing different sports. I performed granular synthesis on sounds from basketball, tennis, racquetball, soccer, and hockey to get this. Throughout the piece you will hear balls dribbling in the background and sneakers squeaking. A buzzer will sound and transition the game into halftime where the synthesized voice created from reverb will act as the halftime show.

After halftime the piece starts slow and gets louder as the tempo increases. This symbolizes the suspense going into the final stretch of the game.

The piece continues to get louder and the piece ends with a suspenseful sequence of sounds leading to a buzzer sound and a swish representing a buzzer beating shot to end the game.

Please be aware that there are basketballs dribbling in the background and those are intentional and not clicks.

My goal of the composition was to make it entirely out of different combinations of ball and sport sounds.

Saurabh Sanghvi, is a junior in Electrical and Computer Engineering at Carnegie Mellon University. The purpose of this composition was to represent a sports game and specifically a basketball game. Sanghvi is an avid sports fan and often works on creating music that resembles sports.

### ***Collage* – Chong-Oak Lee**

[0028\_chongoal.mp3]

The first part of the piece features a simple melody with unexpected rhythmic breaks. The middle part fades into a more steady sound that is harsh. This part of the piece also features traditional style music with drums and piano that is mixed with the granulated sounds from the previous part to contrast the two different sounds. The last part of the piece returns back to the simple melody for closure. The intention of the piece was to contrast between melody and rhythm. It also contrasts between western music and the harsh, but interesting sounds generated using techniques learned in class.

Chong-Oak is a CS major, minoring in Physics and Music Technology. His musical interests range from classical music to heavy metal music. He plays guitar in a video-game band called Battlecake based in CMU. His favorite food is wings and he likes to play tetris and tennis.

### ***Dabrota i zlo* – Ryan McCulloch**

[0029\_rmccullo.mp3]

This piece is a better realization of what I tried to accomplish with earlier project. My goal was to create a dialogue between the various different elements of the piece. Thus the dichotomy of original music and quotation is essential to the framework. The instruments I

created used pitch and rhythmic materials derived from the opening line. This opening material is the framework for further pitch materials and for the counterpoint of contour. All of the velocities used in the scores are based upon a mod-4 pattern that is reused again when I edited the shapes within Audacity.

I used various synthesis techniques to create the various instruments and quotations. The piece is a homage to my former teacher Dr. Yakov Gubanov, a former student of one of my favorite composers Dmitri Shostakovich. The quote that is used in the piece is from Shostakovich's Piano Concerto no. 2, written for his son to perform with his father on the road. The name Dabrota i zlo is Russian for "Good and Evil", which is derived from a lecture Dr. Gubanov gave on the music of Shostakovich. I actually quote him both saying good and evil. The initial quote is a spectral quote used in the instruments and the other is a direct quote, which closes the piece. The last thing the audience hears is "Nobody on Earth does evil for the sake of evil as such." In sentiment, this is supposed to be an inversion of the relationship of master to student.

Ryan McCulloch is a Graduate Composer. He studied composition and guitar at Berklee College of Music. He has studied with Dr. Yakov Gubanov, Dennis Leclair, Leonardo Ballada, and is currently studying with Dr. Noel Zahler.

### ***Sonic Echo – Dmitry Portnoy***

[0030\_dpportnoy.mp3]

This piece was created with a UPIC-like editor (which is basically a frequency over time graph) and I tried to explore the possibilities that were available with this editor. I used different frequency over time curves to achieve different effects and create interesting progressions. I combined a lot of them to make richer sounds. Even though each curve results in a simple frequency varying sine wave, the overall result is much more interesting than I would have imagined and demonstrates the range and depth of sounds that can be created quite quickly with a UPIC-like editor.

Dmitry is a CS major, minoring in Math. He hasn't previously delved too much into computer music or music composition and he was excited to

learn more about these topics while making the composition. He likes to program, design video games, and read in his free time and he is from Potomac, MD.

### ***Parallelism – Dan Lacker***

[0031\_dlacker.mp3]

More of a collage than a story, my piece is inspired largely by geometry and its relationship with music. Samples of laughter, tablas, and the bass guitar provide most of the source material, and the arpeggiator library I developed for Nyquist is also heavily featured, not only for pattern-generation but also for manipulations of timbre.

Dan is a Computational Finance major, minoring in Computer Science. He supposes music's mathematical nature is what drew him to computer music. Though he particularly enjoys listening to (and seeing) musicians who use computers or other music technology as improvisational instruments, and grounding the electronics with a human element. In his free time he enjoys going to live music shows and festivals as well as making music with his laptop and bass guitar, and he is from Richmond, VA.

### ***The Attack of Aliens – Brian Pak***

[0032\_bpak.mp3]

My piece was designed to describe the attack of aliens in a peaceful town on Earth. The piece starts with a peaceful and soft introduction melody, to illustrate mundane life in a town. However, suddenly, there comes a weird sound coming from the sky. The period of the sound gets shorter and shorter, making people nervous and fearful. Finally, aliens come down to Earth and have a fight with humans, and takes over (yes, a sad story). Every sound source used in my composition is generated by Nyquist, but there is heavy use of sampling of many existing sounds from everyday life, which are downloaded from Freesound.org. I combined the sound sources with techniques I learned throughout the semester, such as FM oscillator, various filters, granular synthesis, modulation, and pattern controlling.

Also, to organize the composition, I have used Audacity heavily. I have used multi-tracks, various effects that can be done through Audacity,

such as echo, amplification, reverse, invert, repeat, etc.

Brian is a CS major, minoring in Software Engineering and Mathematical Science. He personally enjoys listening to CCM (Contemporary Christian Music), which makes him feel comfortable. His interests include gaming, hacking, and doing nothing. After he came to the States, he went to high school in New Jersey for 4 years, and is currently attending CMU.

#### ***A Modern Band – Aaron Daniele***

[0033\_adaniele.mp3]

My piece was designed to use a few different synthesis techniques to simulate a few different musical instruments. I did some research to find the ratios between different modes of vibration of circular drums as well as frequencies commonly emitted from gongs and bells in order to produce my own gong, bell, drum and bass drum sounds. Also, I used a comb-filter on my voice along with infinite recursion and a few randomized variables to create some violin-like sounds to accompany the percussion.

Aaron is a CS major, minoring in physics and business management. He does not prefer certain modern art or music which relies almost wholly on randomness and chaos, but rather he enjoys some semblance of structure which uses a few random components or unexpected changes to connect the pieces. His interests include lifting, playing sports, being with friends, etc., and he is from Altoona, Pennsylvania.

#### ***Four of a Kind – Jeff Carlson***

[0034\_jwcarlso.mp3]

This composition is composed of two pieces to be part of a larger suite.

Jeff Carlson is a junior in the School of Computer Science and is also pursuing a minor in Music Technology. Jeff is interested in composition as a hobby, although this is only his second piece that has been exposed to a listening audience.

#### ***Man'slaughter – James Forbes***

[0035\_jfforbes.mp3]

I called this piece Man'slaughter not because I wanted to be morbid. The original samples I used

were of my friends laughing. I then turned these into something more macabre. I used granulated synthesis, reverb and filters, as well as a variety of other techniques outlined in composition.sal. I also used guitar and bubble samples.

The concept behind the piece's progression isn't a story. It's just a feeling I wanted to create within the listener. I wanted the listener to have to find a rhythm, that's why I used patterns that didn't have a defined time signature. I also wanted to have the middle section make the listener afraid, to feel surrounded by these overwhelming noises. I shifted between somewhat regular patterns and granular samples, this was to keep the listener intrigued. Finally, one last highlight is the violinish sound at the end. That is actually a guitar, compressed, filtered and reverbed. I wanted to create a sort of scratchy, nails-on-chalkboard, angry sound, and it came out sounding like a violin.

I am a junior in ECE with a minor in Music Technology. I grew up in the USA and, primarily, the Philippines. In terms of what I listen to, I'm a firm believe that every genre of music has both its good and bad music. I simply listen to what I define as good music, regardless of genre. I play bass guitar, guitar and piano. Apart from music, I love hockey and the Pittsburgh Penguins.

#### ***Gumby – Nikola Ljuboja***

[0036\_nljuboja.mp3]

While incorporating many of the concepts in this class and keeping the level of abstract music as heard in class, I tried to create a story that exemplifies one of my favorite videos on Youtube. It's a comedy dealing with robot puppets and this piece goes along with the story of the video which is also five minutes long. I also added some lines from the video in my piece which helps show what place in the video the piece is in. The beginning starts with the door opening and the characters all cheery and making pasta. I used fmosc to create talking robot noises and bell-like sounds to represent the cheery walk of the robots. The next part has harsher robot noises and more vibrato because they go to a factory that makes the actual pasta. I tried to represent the factory robots with these sounds. The lower pitch vibrato sounds are the making of the pasta and the putting

in of the salt and spice are the high pitch vibrato sounds. Next, all the ingredients are mixed and I used feedback delay to represent mixing and churning of the butter to show the repetitiveness of it. I also incorporate vibrato. Next, I have more robot noises to show how they are talking and arguing at this point in the video. After that, the factory robots start to assemble and create an army. At this point in my piece I use the granular synthesis of the actual video to create an army assembling and getting ready to attack. The voices get harsher and more ready to attack. Then, I use harsher vibrato oscillators and fast pass vibrato to represent the fighting and action that are going on in the video and then finally the piece ends with the actual fight and slaying of the main character. It was really fun and cool to try and create my musical story of this video. I tried to encompass the flow of the music with the flow of the story and threw in my favorite lines to help the listener understand the different parts of the video. I used stereo in order to make the sound of the dialog more dynamic. I did the stitching of sound in both Nyquist and Audacity but created all the sound in Nyquist. Then, I used effects in Audacity.

Nikola Ljuboja is a junior at Carnegie Mellon University and is majoring in Electrical and Computer Engineering with a minor in Computer Science. He is on the tennis team and loves all sports. He plays no instrument and has no knowledge of music. However, due to the abstract level of computer music, he is still able to produce musical pieces. His major focuses on Digital Signal Processing and Embedded Systems and he uses knowledge in these areas to generate his unique sounds.

### **Calvino – Rushikesh Sheth**

[0037\_rksheth.mp3]

This piece was centered around an abstract melody. The melody creates the backdrop for various voices that evolve into unrecognizable noises. The effect is meant to be eerie and at times jarring.

Rushikesh Sheth is a junior ECE major minoring in CS. He finds beauty in randomness and feels that this influences his music in interesting and novel ways. He is from the San Francisco Bay Area.

### **Untitled – Robert Saris**

[0038\_rsaris.mp3]

*(no program notes)*

### **Ominous Glow – Samir Singh**

[0039\_samirsin.mp3]

My piece starts off with an ominous gong sound, going into a signature melody that I created which has an ancient type of feel. It also pans from the left to the right and then back. From here, I then go and start a series of FM sounds which have an interesting vibe to them, and then to a saxophone melody. After this I start a series of interesting envelope sounds which is a sudden jump from the saxophone melody. Then I do an up and down piano roll. The different instruments in the midst of the envelope sounds keep the composition interesting and keep the listener engaged. After the piano roll, I then go into a series of clarinet envelopes. After this I go into a flute melody, then a final "missile" noise sequence. Finally I end the piece with the same ominous gong sound from the beginning.

Samir Singh is an ECE Major in Carnegie Mellon University. I was born and raised in New Brunswick, New Jersey. I enjoy playing soccer, basketball, and football. One of my major interests is listening to all different kinds of music. Introduction to Computer Music was a perfect course for me because I enjoy programming and I also love music. The combination of the two is a perfect match for me.

### **Untitled – Si Cai**

[0040\_scai.mp3]

This composition consists of a list of random pitches played by different instruments and using different modulation effects. Although the pitches are random, there are still some underlying guidelines for when different instruments are turned on to play or when different modulations are applied.

The reason I use random pitches is that I believe that music is a very broad medium where people from different cultures and regions can express what they like freely. These random pitches represent that there should be no specific rules for how music should be. It should be

anything that can express ourselves in any way that we want to.

I am a Junior major in Electrical and Computer Engineering. As a child, I lived in many different cities in China due to my parents' profession.

Because of that, I got to see, experience, and learn about all different culture in those cities. At the age of 16, I immigrated to the U.S. with my mother. This opened up a whole new world for me. Everything from living to dining to education and many many more are all distinct from what I'd learned. I am so grateful for this amazing experience. It made me realized that there are so many more terrific things out in the world to explore. I hope this composition can display all the different cultures and free thinking around the world.

#### **Wow whoa – Seth Lisboa**

[0041\_slisboa.mp3]

I really enjoyed some of the sounds I had used in earlier projects as well as FM, envelopes and some modulation. This piece is supposed to incorporate these sounds created by programming in Nyquist. I also incorporated sound bites of a reversed guitar which I thought was really interesting. The piece is supposed to give a very random flow where when you think it's reaching a chorus of sorts it breaks off to something else. There is a lot of merging of scores as well as clear breaks into the sound bites. I think the piece might have trailed off in the end but overall I was more or less pleased. It's called Wow Whoa because throughout the piece you can hear these sounds which were generated using the techniques above. Audacity was also used to do pitch manipulation, reversing, and splicing.

I am a CS major. I *really* enjoy music, a broad spectrum. I also appreciate the difficulty in composing interesting works and sounds especially after this class. I'm pretty sure I could live without TV but not music. My favorite genre is Reggaeton and I live in Jersey.

#### **Titanium Dream – Tye Wang**

[0042\_tianyuan.mp3]

My piece was inspired by Buddhist monks, who may repeat the same phrase for many hours

as a form of prayer. The word I chose to repeat was "titanium", because I think it is a funny sounding word and is occasionally my nickname. Instead of the same sample used over and over, I altered it using many of the techniques we developed in class. These included granulation, filtering, and use of piecewise linear functions to alter amplitude. Then, these samples were randomly stretched and randomly combined to make a total piece. Randomly placed bass kicks and hi notes are interspersed with the phrases to break the monotony.

I am a junior in Computer Science at CMU. I am very open minded and I draw my influences from a variety of sources. I am also energetic and upbeat and I like repetition. Thus, my favorite genres of music include techno and hip hop. My other interests include playing pool, NBA, and chess. I was born in Beijing, China, and I currently reside in Louisville, Kentucky.

#### **Fine Tuning – Vini Oommen**

[0043\_voommen.mp3]

My piece was designed to display chaos and confusion as it takes you through a musical journey to play a tune just right. It plays bits and pieces combined with static, indicating utter confusion and then eventually, everything is fine-tuned to sound just perfect. I have used all techniques that I have been taught in Computer Music such as granular synthesis, illustration of FM instruments, filtering vocal sounds and much more. This involved heavy use of Audacity and Nyquist.

I am an ECE major with a passion for music. I like classical music mostly because of my Indian background and I have been vocally trained since the age of four, although you might not believe me.

*On behalf of my class, I'd like to thank our TA's – Robert, Dipanjan, and Matt – and Amelia Williams for their tireless work supporting the class throughout the semester.*

*I'd like to thank my students for all their hard work. It has been great, and I hope you had fun. - Roger Dannenberg*

