5.2. Computational Musicoology

We also hope to use Nuance in the future for musicological research. We feel tools like Nuance will prove to be elemental in the preservation of multimedial digital fingerprints of musicians across many musical contexts for future generations. We hope to one day have a digital library not only of musical audio recordings and scores but also transcribed performance subtleties of great performers of the past.

5.3. In The Digital Audio Workstation

Lastly we look forward to a future where multimodal data streams can be integrated into the general workflow of recording and composing as an electronic musician. Working with multimodal musical instruments affords many unique artistic possibilities, from directly manipulating sound parameters, to extracting higher-level features and mapping them to control parameters. Limited ‘general’ tools exist which begin to facilitate these interactions outside of the research laboratory [5], and we hope for Nuance to help guide the way in making this accessible to today’s electronic musicians and composers. With this in mind, we have written the core of Nuance such that it would remain unchanged in the future if we were to author a cross-platform version in VST/Audio Unit/RTAS plug-in formats.

6. CONCLUSION

In this paper we have described Nuance, a software tool for recording synchronous multimodal data streams. Nuance currently supports high-resolution audio input, as well as input from nearly any musical instrument or sensor system via serial, OSC, and MIDI protocols. Nuance is different from other solutions in that it is a no patching, near-codeless solution. Nuance was designed to be operated by musicians and researchers alike, and has already been used in many real-world scenarios including performer recognition, drum-stroke identification, and performance metrics tracking. Not only can Nuance increase productivity in MIR scenarios, but we hope it points to and establishes a foundation for other future musical endeavors, both in the MIR-laboratory, the studio, and the musical classroom.

REFERENCES


ABSTRACT

There is a gap in Macedonian music. While the classical, pop, underground, and world music scenes are well developed, experimental and electronic music virtually do not exist. The current curricula for music education in the country do not support experimental and/or electronic music education. Because of lack of knowledge and experience, Macedonian musicians cannot keep up with the developments in the international professional field nor compete in the international market. In this article I will describe a model for international collaboration that laid the foundation and put things in motion for the introduction of music technology in Macedonia. The model is based on knowledge exchange and non-formal learning, breaking the traditional way of educating the students as well as the audience. The projects that were realized in the past years according to this model have pushed the boundaries and resulted in a new curriculum for music technology that the School of Music in Macedonia will introduce in September 2012.

1. INTRODUCTION

Breaking the traditional ways of educating, communnicating, collaborating, learning, presenting and experiencing in one country is more than a challenge. Once the tradition is so ingrained that it offers safety and comfort, any attempt to change this would fail. Fear of the new, lack of educated staff, lack of resources and facilities as well as competition with traditional program within the school are factors that make it almost impossible to even begin introducng changes.

1.1. Historical overview and current situation

Even though considered a region of great musical talents, the formal music education in Macedonia is relatively new. The only School of Music in the country was officially opened in 1978 as part of the University St. Cyril and Methodius in Skopje and took over the previously founded one (1966). Before, musicians were being educated in other cities in former Yugoslavia [3]. It took a great effort to shape the curriculum of the new School of Music as it was and the results were satisfying for the people involved. During the years, any attempts to add contemporary or experimental music were avoided.

In the 1960’s the Macedonian composer Risto Avramovski was among the first to employ sonoristic methods and the use of new technology at the time (the use of electronic instruments and tape) [4]. Even though unique in his artistic language and knowledge that linked the classical composition techniques with the use of electronic means, his many attempts to join the teaching staff at the School of Music failed [3].

With the help of the Royal Dutch Conservatoire in The Hague, in 1998 the School of Music in Skopje set up a studio and a sonology department [8]. The Royal Dutch Conservatoire gave a number of lectures for electronic music including guidance in the use of the studio. The outcome was positive but outstandingly modest. Despite the great interest students showed in learning and making use of the equipment, the studio remained open for use only to postgraduate composition students, and the school has an average of two or less postgraduate composition students a year.

Occasionally, Macedonian musicians/researchers living abroad organize concerts with international artists, tickling the current musical scene and presenting state of the art pieces from other countries. Unfortunately, offering knowledge that is new can be seen as threatening and therefore rejected. Once the means are there, keeping a locked door doesn’t really stimulate work. On the other hand, only showing how the world has moved on without a concrete idea of how to catch up won’t help either. Because of the economic position of the country, most people cannot afford a computer, let alone the audio equipment necessary to work at home. In the 1990’s a group of composers left the country [5] in search for knowledge. Most students cannot afford the trip and they should not need to. The knowledge and possibility to learn and grow should be available to them.

1.2. In this text

In this text, I argue that the problem with the previous attempts was the top down approach. The institution was responsible to pass the knowledge on to the students. I will describe a different and creative paradigm based on knowledge exchange and non-formal learning used to introduce music and technology in a traditionally oriented educational system. This paradigm that does not impose itself is presently being modified by the people involved and also immediately includes the much-valued audience.

In the next section, I will discuss the clash between technology and tradition and I will describe how the first step was made possible. Then, I will describe an educa-
tional model based on knowledge exchange and non-formal learning, followed by its application in the introduction of music technology in a traditionally oriented educational system. Next, I briefly discuss other projects that followed the same paradigm successfully. Finally, I present the conclusions and future perspectives of this work.

2. TECHNOLOGY DOES PENETRATE

If the richness and authenticity of a culture are measured by the personal signatures of its art [1], then the artists need to be able to constantly explore, search for new languages, re-discover themselves, experiment and reflect with the outside world. We need to create opportunities for continuous information and knowledge exchange along with a space to experiment with the knowledge gained to support the creative drive and place the artist in the professional market. In the past decades, the artistic developments in most European countries rely on technology.

2.1. The challenges technology brings

The fast changing requirements that professionals in the field must satisfy should shape the curricula, making sure they follow the outside world and teach young people how to keep up with the changes while continuously adapting and developing professional education programs [9].

If people from the same generation are shaped by the technology they grow up with, they become experts in their field; in other words, I proposed a blind date between professionals born in the 90s and the Macedonian NGO Public Room in the form of an international program [9].

2.2. Challenges in the preparation phase

Being faced with these challenges, the preparation phase before the first project took three years, during which contact was made with every institution in Macedonia that came up regularly during the project. During this time period they grew up in [2], then the above mentioned could be challenging for professionals born before technology became so self-evident. They grew up with technology; in other words, I proposed a blind date between professionals born before technology became so self-evident. They grew up with technology;

2.3. Opening doors

In 2009, the very first step was made possible independently of any music or education institution in Macedonia, with no financial support from the country. For this very first opportunity I decided to organize a summer project with the support of the Zoey Foundation for Arts and Culture, in cooperation with the University of the Netherlands that is well known for its music and arts education, they had no prior experience in improvising and were not comfortable when asked. There was no clear division between working and resting hours; having the piece almost at any time; they appeared to be slower in decision-making; not necessarily concerned by the end result but pointing on details during the working process. These students are not used to thinking from or within limitations of any computer program but are used to working from idea to realization.

2.4. Objectives

The general aim was to initiate changes in the curricula of music education in Macedonia in order to create grounds for the introduction and implementation of music technology. In order to achieve this, several objectives were set:

- Initiate cultural cooperation and knowledge exchange between the two countries;
- Create a platform where young people with different musical and cultural backgrounds can meet, experiment, create and learn from each other;
- Support the youth in Macedonia in their quest for knowledge;
- Connect the participants to existing musical networks and promote the project to create possibilities for the participants to promote their work internationally.

Due to difficulties within the institutional cooperation, I started with a pilot project in the form of a summer meeting.

4.3. Macedonian participants

The Macedonian group brought the instruments: violin, viola, cello, flute, goblet drum (tarabuka), classic guitar, bass guitar, kaval (Macedonian traditional instrument) and a self-made didgeridoo. Almost every participant of this group had at least some previous experience with music technology, it had at least some previous experience with music technology, they had no prior experience in improvising and were not comfortable when asked. There was no clear division between working and resting hours; having the piece almost at any time; they appeared to be slower in decision-making; not necessarily concerned by the end result but pointing on details during the working process. These students are not used to thinking from or within limitations of any computer program but are used to working from idea to realization.

4.3.1. Cultural characteristics relevant to the project

The Macedonian group comes from a surrounding in which it is not accepted not to know something, as this implies one hasn’t studied hard enough; it is considered shameful to openly say so. There was also a clear issue with authority, as these students didn’t feel free to articulate their opinions to the Dutch lecturers guiding them.

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5. WORKING METHODS

In July 2009 the two groups came together for the first experimental meeting in Ohrid, Macedonia.
formal learning, followed by its application in the introduction model based on knowledge exchange and non-formal languages, re-discover themselves, experiment and need to be able to constantly explore, search for new present the conclusions and future perspectives of this educational system. Next, I briefly discuss other projects produced in music technology in a traditionally oriented tradition.

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The fast changing requirements that professionals in the field must satisfy should shape the curricula, making sure they follow the outside world and teach young people how to keep up with the changes while continuously adapting and developing professional education programs.

If people from the same generation are shaped by the time period they grew up in [2], then the above mentioned could be challenging for professionals born before technology began to self-evident. They grew up with certain standards, values, beliefs and preferences that are then taken in all phases of life, forming the picture of what the future should look like for them [2]. Consequently, education in general does not support the current generation since it is based on past experiences. The other obstacle that becomes clear is that the current educational system in Macedonia has little impetus for change since new generations are brought up to carry the tradition.

2.2. Challenges in the preparation phase

Being faced with these challenges, the preparation phase before the first project took three years, during which contact was made with every institution in Macedonia important for realizing the task. This includes the University, private schools as well as the appropriate ministries. Even though the idea was generally eagerly accepted, the reactions of the institutions of major importance for this task were modest to say the least. Some institutions, after very enthusiastic encounters were unreachable for further contact, some were interested only after their needs would be met and there were political and individual matters involved.

After three years of contact, there was still no concrete development and no access to the students. The introduction of music technology in the education became a side note of a bigger challenge. In order to fully incorporate this new field the curricula needed to be adapted in a way that would ensure that the education supports the young generations in their development rather than adapting the youth to the existing education. During the preparation phase it became evident that the only way to initiate such changes was to actually avoid these institutions altogether.

3. MAKING THE FIRST STEP

The decision to avoid the institutions brought things back to perspective. The problem with the approach during the preparation phase was that there was no access to the young students.

3.1. Generation Einstein

The new generation, born after 1988, has been named differently by different scientists, for example the copy-paste generation, or the grab-and-mix generation [2]. A more positive title is Generation Einstein [2]. This generation recognizes that the world consists of an enormous amount of, most of the time, contradictory information; that not everything is what it seems; that a lot is possible and that the world is fragmented and pluralistic [2]. The Generation Einstein perceives and processes information much faster than we are used to. It is a generation of doers and the education in many European countries, not only in Macedonia, is still shaped for doers. So I decided to organize a summer project in the form of an experimental meeting where music technology would be introduced to the technology savvy young generation, full of artistic drive but lacking the hands-on experience. In other words, I proposed a blind date between music and technology.

3.2. Opening doors

In 2009, the very first step was made possible independently of any music or education institution in Macedonia, with no financial support from the country. For this very first opportunity I decided to organize a summer project with the support of the European Commission, organized by the Zoey Foundation for Arts and Culture, in cooperation with the Utrecht School of Music and Technology and the Macedonian NGO Public Room in the form of an experimental music meeting where, in order to introduce music technology, it would be met with an equally present opponent: tradition.

3.3. Technology vs. Tradition

"Will technology destroy our tradition?" was a question that came up regularly during the project. During this project, tradition and technology had very specific meanings.

In the context of this project, tradition stood for tradi-


4. FACING THE CHALLENGE

What would happen if we brought together two completely different groups of young people that are the exact opposite of each other? One group of ten music technologists with relatively little experience with acoustic instruments, and the other group of ten music performers, that play classical instruments and have no previous experience with electronics. Just to spice things up a little, we add huge cultural differences to the pot. One group comes from The Netherlands and the other from Macedonia. To prevent things from getting dull, we give them ten days to overcome their cultural differences, get to know each other, make mixed groups that will work together, come up with ideas, compose, prepare and perform the results in front of an international audience.

4.1. Opposites Attract – Profile of participants

Equality among the participants was important to the outcome of the project. Besides the division between music technologists and classical instrumentalists, each group could be divided in a way that brings diversity in knowledge. On this very first meeting, there were no traditionally educated composers invited.

4.2. Dutch participants

The Dutch group of music technologists had Audio Designers, Sound Designers as well as music production students. These young people are used to working very fast; being finished before the deadline if possible; having a carefully structured daily schedule that includes working and resting hours; having results that would impress, but not necessarily by how deep the idea was explored; they are used to improvising. In their working process, the Dutch students are very much used to thinking only within the possibilities (limitations) of the computer program they are using. Except for a few pupils, the professional music education of the Dutch students had lasted no longer than 3-4 years at the time of the realization of the project.

4.2.1. Cultural characteristics relevant to the project

The Dutch group has no experience with authority in education. The youngsters have no problem saying they don’t know how to do something, as in The Netherlands that implies that one is eager to learn, they speak their mind and their teachers are counting on that.

4.3. Macedonian participants

The Macedonian group brought the instruments: violin, viola, cello, flute, goblet drum (tarabuka), classic guitar, bass guitar, kaval (Macedonian traditional instrument) and a self-made didgeridoo. Almost every participant of this group had at least ten years of music education at the time of the project realization. They had a stable education basis and possessed excellence in their instrument. However, as instrumentalists with a strictly classical music education, they had no prior experience in improvising and were not comfortable when asked to. There was no clear distinction between working and resting hours, busy with the piece almost at any time; they appeared to be slower in decision-making; not necessarily concerned by the end result but pointing on details during the working process. These students are not used to thinking from or within limitations of any computer program but are used to working from idea to realization.

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5.1. The rules of the project

During the project there were a few ground rules that helped guide the development of the project. Choose a partner to work with, get out of the comfort zone, take part in the morning conversations called Distilled Experiences, be open for work-in-progress presentations and take part in the evening concerts.

The participants were to make mixed groups Dutch/Macedonian and compose together a piece for acoustic instrument(s) and live electronics. The general theme the participants had was to reflect on this cultural encounter in their newly composed musical pieces.

Getting out and meeting the audience played a very important role in the process. All the activities took place in unexpected working spaces – outside among the locals, in museums, public squares, beaches and other locations around the lake of Ohrid. Each day we were in a different location. The day started with the Distilled Experiences, during which the group would reflect on the progress of the project as well as discuss certain topics, like inspiration, culture and tradition or esthetics.

There were two presentations of work in progress in two different locations during the project. Every evening a performance was organized on a different site. The presentations were meant for testing the work-in-progress or improvisation. There were no lessons, no workshops and no one that would tell the participants what to do. They would have to figure that out on their own.

5.2. Guidance

The project introduced the participants to a set of contemporary techniques and concepts behind improvisation, technology-based composition and performance.

The participants were free to choose by themselves what kind of tools they were going to use, but mainly they were working with Max/MSP or SuperCollider. There was plenty of guidance for the young participants by lecturers experienced in improvising with students in various teaching methods. The four professionals were carefully chosen so that their knowledge could cover everything from classical orchestration, instrumentation, to programming and multimedia project based composing.

5.3. Challenges during the realization

The project brought many challenges as both the Dutch and Macedonian group had expectations that were not fulfilled. Most of the challenges occurred in the first days.

5.3.1. There were no lessons

The Macedonian group expected to have a passive lesson environment. They had their paper notebooks handy and were ready to learn! Some were disappointed and a few even a bit angry when they realized that we were not going to teach (not like that). The lecturers were not there to teach; they were there to be approached by the participants if needed. During the project we were not going to impose anything but merely offer the participants all the means they could possibly need and guide them through achieving their ideas, according to the rules they would make. With the deadline approaching, there was no time to re-think strategies, so the participants relied on what they had recently learned, knew best or tried out during the school year.

5.3.2. The lack of scores

The Macedonian musicians expected to have scores and were not sure they would be able to work without them. There were even strong arguments at the beginning of the project because they did not feel that they should improvise. The participants needed to have a compositional frame, they were there to make sure they give the best possible interpretation on the work someone wrote. As we learned from them, they were educated not to express their own thoughts in music but to play what a composer had written. They were also surprised when they realized that programming a Max patch might take longer than a few minutes.

5.3.3. No borders

The Dutch group expected to receive some kind of creative borders within which they would be working. However, the instructors didn’t make any restrictions and left that to them.

5.3.4. Age of the participants

The younger participants were facing certain problems for the first time and therefore required more, or a different kind of guidance.

5.3.5. Cultural differences

When the Dutch group tried to impose their Western-European superiority and get away with their fast-result-seeking way of work, it very much failed. The Macedonian group, on the other hand, insisted on taking the time to experience, feel and live the music they were making. But there simply was no time to do that. Since music was the only asset they could hold on to, and the only thing they had in common, with the deadline racing on, they didn’t think of much else. They could talk to each other, find middle grounds and create a synergy of the knowledge they had as a team.

5.3.6. Lack of feedback

As mentioned previously in the text, the Macedonian group found it very challenging to speak their mind. The authority of the lecturers in Macedonia is high and even in informal setting was still highly affecting the way these participants acted. We learned from them that if they were there to learn, then they should do so, without asking questions and without disagreeing. However, without their feedback it was very difficult to work.

5.4. Resonances

The Macedonian group did not have any prior experience with electronics or other art fields, which made the group balance out. As explained further in this text, this project brought valuable knowledge not only to one group but also to everyone involved. The participants were learning from each other and communication was a general skill that was working on throughout the project. Everyone involved was carefully taking into account all the cultural, educational, and language differences while structuring thoughts and creating ideas that would then articulate on a way that the other person would understand.

6.1. Dutch group

The Dutch youngsters were highly influenced by the Macedonian rhythms, modes and melodies as well as the process of making music. By closely working with the musicians, they enriched their theoretical knowledge and learned the instruments, how they are built, different ways to produce sound, different ways to play with the instruments and electronics. They also learned to make scores that would work both for the electronics and the instruments. An important moment was that they were learning to explore their ideas deeper, question choices and decisions and be very critical. Faced with colleagues who do not approach their ideas from the construction of the score (which was being used, thinking within the possibilities of software was not an option. They became better at setting creative borders. They learned that having all the equipment is only good if you know what to do with it.

6.2. Macedonian group

During the project, the Macedonian musicians learned to improvise and actively participate in the process of creation. They learned new ways of writing and performing music and were working with graphical notation and drawings. They made a start with sequencing software (Logic and Audacity), got to know how a patch in Max/MSP was created, experienced improvisation and performing with live electronics as well as how technology can be used in the composition. They also learned to have fun with live electronics.

These young people, with time, felt free to speak up, ask questions and even occasionally disagree. Compared to the education they had, they experienced a new way of learning and approaching education. Since this project did not prepare or previously decide on the knowledge it would bring, the participants took the responsibility to "shop" for knowledge by the professionals while individually structuring each learning process. They learned how much there still was to learn.

6.3. Professionals

Analyzing the Dutch group, it was noticed that working with students that already had some kind of experience in working with instruments and live electronics was easier in the sense that, we could also talk about esthetics. Young people being more open to receive the more basic knowledge in order to develop ideas. The same applies for students that had experience working with any other art field, as the younger students, having less experience with music communication problems with the players. The Macedonian group did not have any prior experience with electronics or other art fields, which made the group balance out. The questions the participants would ask and the kind of guidance they would ask for provided the lecturers with valuable information about their learning and working processes. The way they would use the information showed their level of experience. It also showed how these young people were educated, what kind of program they were following, which subjects had impact and how they implemented the knowledge.

6.4. Educating the Audiences

The project was shaped to ensure maximum exposure, which meant having the activities take place each day in a different location. This made the project highly visible and easily approachable. While working, the young participants were being approached all the time, wondering what they were doing with all that equipment on the beach or by the lake. Then they would stay and listen a bit, ask questions. It was the same during the performances in the evenings.

Getting in touch with the local people and international tourists made the youngsters think about the way they would explain their ideas to people that are not musicians. They were explaining their methods; inspirations and techniques used as well as asking questions regarding the use of technology in contemporary music to non-musicians of all ages. This motivated people to attend the concerts.

7. A CHAIN REACTION

The way the project was structured resulted in the young participants learning more than they or the professional team could anticipate they would. The objectives of the project were met and the young participants from Macedonia were actively supporting the further developments. They had experienced another way of learning and touched another field in music that they wanted to explore more and develop in. The reactions of the participants, and especially of the young people that did not participate, stressed the need for music technology and for repeating the project. Because of these positive reactions, the doors were opened to several schools. This resulted in a new project. In 2010, I organized Urban Resonances, a project that brought several lecturers from the Netherlands to the Macedonian and five music high schools in Macedonia to give con-
5.1. The rules of the project

During the project there were a few ground rules that helped guide the development of the project. Choose a partner to work with, get out of the comfort zone, take part in the morning conversations called Distilled Experiences, be prepared for the work-in-progress presentations and take part in the evening concerts.

The participants were to make mixed groups Dutch/Macedonian and compose together a piece for acoustic instrument(s) and live electronics. The general theme the participants had was to reflect on this cultural encounter in their newly composed musical pieces.

Getting in touch and meeting the audience played a very important role in the process. All the activities took place in unexpected working spaces – outside among the locals in museums, public squares, beaches and other locations around the lake of Ohrid. Each day we were in a different location. The day started with the Distilled Experiences, during which the group would reflect on the progress of the project as well as discuss certain topics, like inspiration, culture and tradition or esthetics.

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5.3.6. Lack of feedback

As mentioned previously in the text, the Macedonian group found it very challenging to speak their mind. The authority of the lecturers in Macedonia is high and even in a non-formal setting was still highly affecting the way these participants acted. We learned from them that if they were there to learn, then they should do so, without asking questions and without disagreeing. However, without their feedback it was very difficult to work.

6. WHAT WAS LEARNED

Taking a step back and letting the participants have their own experiences and come up with questions brought a significant amount of knowledge to the project. By not imposing, not giving anything, but merely making knowledge available, facts about what was needed in Macedoniasurfaced. Getting to know the culture at the same time opened ways to realize these.

As explained further in the text, this project brought valuable knowledge not only to one group but also to everyone involved. The participants were learning from each other and communication was a general skill that was the same for everyone. Learning was carefully taken into account by the cultural, educational, and language differences while structuring thoughts and creating ideas they would then articulate on a way that the other person would understand.

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6.2. Macedonian group

During the project, the Macedonian musicians learned to improvise and actively participate in the process of creation. They learned new ways of writing and performing music and were working with graphical notation and drawings. They made a start with sequencing software (Logic and Audacity), got to know how a patch in Max/MSP was created, experienced improvisation and performing with live electronics as well as how technology can be used in reinforcement. They also learned to have fun with live electronics.

These young people, with time, felt free to speak up, ask questions and even occasionally disagree. Compared to the education they had, they experienced a new way of learning and approaching education. Since this project did not prepare or previously decide on the knowledge it would bring, the participants took the responsibility to “shop” for knowledge by the professionals while individually structuring each learning process. They learned how much there still was to learn.

6.3. Professionals

Analyzing the Dutch group, it was noticed that working with students that already had some kind of experience in working with instruments and live electronics was easier in the sense that, we could also talk about esthetics. You could think of a more basic knowledge in order to develop ideas. The same applies for students that had experience working with any other art field, as the younger students, had no communication problems with the players. The Macedonian group did not have any prior experience with electronics or other art fields, which made the group balance out.

The questions the participants would ask and the kind of guidance they would ask for provided the lecturers with valuable information about their learning and working processes. The way they would use the information showed their level of experience. It also showed how these young people were educated, what kind of program they were following, which subjects had impact and how they implemented the knowledge.

6.4. Educating the Audiences

The project was shaped to ensure maximum exposure, which meant having the activities take place each day in a different location. This made the project highly visible and easily approachable. While working, the young participants were being approached by people that were wondering what they were doing with all that equipment on the beach or by the lake. Then they would stay and listen a bit, ask questions. It was the same during the performances in the evenings.

Getting in touch with the local people and international tourists made the youngsters think about the way they would explain their ideas to people that are not musicians. They were explaining their methods; inspirations and techniques used as well as answering questions regarding the use of technology in contemporary music to non-musicians of all ages. This motivated people to attend the concerts.

7. A CHAIN REACTION

The way the project was structured resulted in the young participants learning more than they or the professional team could anticipate they would. The objectives of the project were met and the young participants from Macedonia were actively supporting the further developments. They had experienced another way of learning and touched another field in music that they wanted to explore more and develop in. The reactions of the participants, and especially of the young people that did not participate, stressed the need for music technology and for repeating the project. Because of these positive reactions, the project was continued in several schools. This resulted in a new project. In 2010, I organized Urban Resonances, a project that brought several lecturers from The Netherlands to the Macedonian and five music high schools in Macedonia to give con-
certs and workshops. The interest of students was so high that all of the presentations were held in completely crowded spaces.

In 2011 the second meeting between Dutch and Macedonian musicians took place during the summer. This time the project was open to composers to take part and we had guest lecturers from visual arts and architecture. Most importantly, lecturers from the School of Music and the music high school in Skopje were also at the project. The doors were open.

Between September and December 2011 Shifting Values took place at the Music High School in Skopje. The kick-off presentation was sold out and students were even standing in the hallway.

In September 2012, the School of music in Skopje in cooperation with the Utrecht School of Music and Technology will be ready to welcome all these interested students with their new curriculum for music and technology.

8. FOR THE FUTURE

In this work, I presented a bottom-up approach to the introduction of music technology in a traditionally oriented music education system. Previous attempts that took the traditional path failed to reach the students. The paradigm presented here, based on non-formal learning had positive responses. The project brought the Utrecht School of Music and Technology and the School of Music in Macedonia in close cooperation. These two institutions are now structuring their cooperation for the future while shaping the new curriculum for music and technology.

The positive outcome of this project might also trigger other art schools to re-evaluate the upbringing of their young talents.

The summer projects turned into very stimulating labs where talented musicians tested their knowledge, ideas, made music, performed together and experimented with new things. In the years to come, I expect to broaden the cultural sphere by inviting lecturers and participants from other countries as well. There are plans to introduce a new art discipline each year to the live electronics: dance, visual arts, game design, among others. These projects help equip young people not only with the ability to adapt to change, but also with the ability to shape the direction of change.

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ABSTRACT

This article introduces a new open-source algorithmic composition system, slippery chicken, which enables a top-down approach to musical composition. Specific techniques in slippery chicken are introduced along with examples of their usage in the author’s compositions. The software was originally tailor-made to encapsulate the author’s personal composition techniques, however many general-purpose algorithmic composition tools have been programmed that should be useful to a range of composers. The main goal of the project is to facilitate a melding of electronic and instrumental sound worlds, not just at the sonic but at the structural level. Techniques for the innovative combination of rhythmic and pitch data—arguably one of the most difficult aspects of making convincing musical algorithms—are also offered. The software was developed by the author in the Common Lisp Object System and released as open-source software in May 2012; see http://www.michaeld-bouwens.org/sc.

1. INTRODUCTION

“Formerly, when one worked alone, at a given point a decision was made, and one went in one direction rather than another; whereas, in the case of working with another person and with computer facilities, the need to make such decisions were scarce—at though you had to limit yourself to one idea—is no longer pressing. It’s a change to work as though decisions were scarce—at though this will be off-putting to some, there are many benefits to interacting with such a system through the programming language it was created in, not least of which is the influential sensibility that such an approach infers. As the computer science adage goes, “When using WYSIWYG [What You See Is What You Get] systems, What You See Is All You’ll Ever Get.”

The algorithmic system in slippery chicken is mainly deterministic but also includes stochastic elements if desired. It has been used to create musical structure for pieces since its inception and for several years now has been at the stage where it can generate, in one pass, complete musical scores for traditional instruments. It can also, with the same data used to generate those scores, write sound files using samples, or MIDI file realisations of the instrumental components.

Hiller suffered under [3] is still with us today. But there are clearly many issues to be mined in algorithmic composition, as the expression of compositional ideas in software often leads to unexpected and surprisingly new, exciting results, and these can seldom be achieved via traditional means.

Algorithmic composition techniques can thus play a vital and energising role in the development of modern music and artists. slippery chicken is an open-source, specialised algorithmic composition program written in the general programming language Common Lisp and its object-oriented extension, the Common Lisp Object System (CLOS). Work on slippery chicken has been ongoing since 2000. By specialised as opposed to generalised, it is meant that the software was originally tailor-made to encapsulate the author’s personal composition techniques and to suit his own compositional needs and goals. As the software has developed however, many general-purpose algorithmic composition tools have been programmed that should be useful to a range of composers. The system does not produce music of any particular aesthetic strain—for example, although not programmed to generate tonal music the system is quite capable of producing it. But if it is to be used to generate complete pieces it does prescribe a certain specialised approach; this will be described below.

slippery chicken has no graphical user interface and there are no plans to make one. Whilst it is clear that this will be off-putting to some, there are many benefits to interacting with such a system through the programming language it was created in, not least of which is the influential sensibility that such an approach infers. As the computer science adage goes, “When using WYSIWYG [What You See Is What You Get] systems, What You See Is All You’ll Ever Get.”

The potential for software algorithms to enrich our musical culture has been established, in the 50’s years since such techniques were first introduced, by personalities as diverse as Hiller, Xenakis, Cage, and Eno. Algorithmic composition usually involves the use of a formal, step-by-step procedures, most often encapsulated in software routines, to create music. The power of such systems is, arguably, still not fully understood or deeply investigated by the majority of musicians and composers, whether highly trained or not. Indeed, in the author’s experience, a lot of the prejudice algorithmic composition pioneer

1 Preparation of this software for open-source public release was supported by the UK’s Arts & Humanities Research Council [grant number AH/P004291].

2 Though the composer Clarence Barlow would perhaps disagree with this, as he states that in his algorithmic works “he would obtain the same results without the help of a computer” [16, 49].

3 Despite much internet attribution, Donald E. Knuth has confirmed to the author that this quotation did not stem from him.


5 It has been used to create musical structure for pieces since its inception and for several years now has been at the stage where it can generate, in one pass, complete musical scores for traditional instruments.