Students combine music and math

Math and music students collaborate to create instruments

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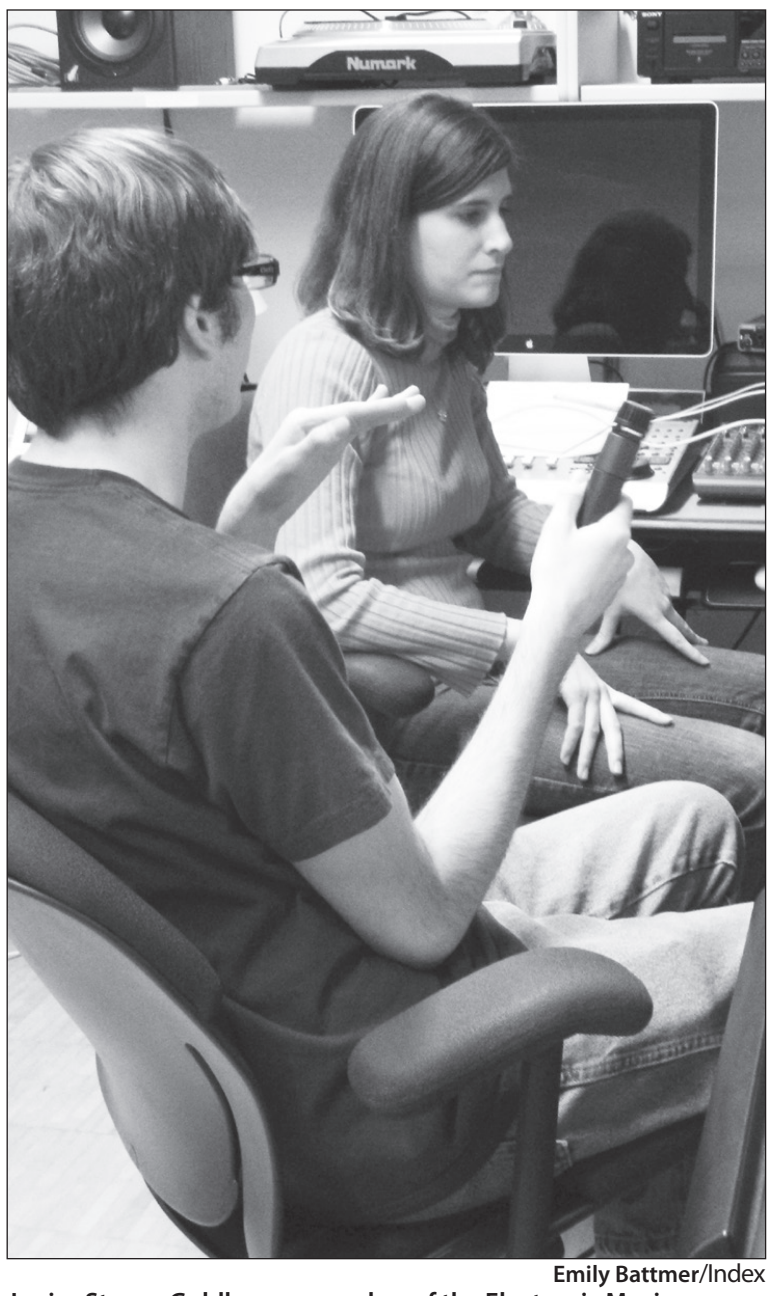

Emily Battmer/Index

Junior Steven Goldberg, a member of the Electronic Music Working Group, shows senior Katie Garcia, a music performance major, how to use his group's sampler and looper, which allows performers to record and manipulate sound, Tuesday during a meeting in Ophelia Parrish. Garcia is not part of the research group but will be demonstrating the sampler and looper during the presentation today by performing with it.

Associate professor of music Charles Gran is combining mathematics and music to create a collaborative experience for Truman State students.

The Electronic Music Working Group, comprised of seven students from the music, math and computer science departments, will be presenting their findings and performing their instruments at 2:30 p.m. today in Ophelia Parrish. The students have been working throughout the semester with the direction of Gran to develop their own electronic instruments with computer software, Gran said.

Electronic music is one of his specialized areas of interest, and he wanted to give students an opportunity to apply their particular talents to the creation of electronic music, he said. He talked to the office of student research and expressed his interest in collaborating with other departments.

"For me, collaboration has always been stuff like writing music for a theater production or something like that," Gran said. "I know there's a larger sort of informal music community at Truman, students who enjoy music and would be interested in getting involved with electronic music but maybe aren't getting music degrees."

Rather than having a group simply create electronic music, Gran said he thought it would be fulfilling to expose students to the design of the instruments themselves. He said he tried to pair the seven members of the research group by their departments, so music students would be partnered with math and computer science students for the project, he said.

The students collaborated to design software instruments using CSound, a "music programming language," Gran said. He gave the research group a presentation about the software, then left them to independently learn the programming language, he said. The students were responsible for learning the code and creating their own work schedule, meeting with Gran once a week to discuss their progress and address any issues.

"Part of it is about an interdisciplinary experience for the students to get a chance to try to create something using the knowledge they have in their particular discipline," Gran said.

Each of the three groups designed an instrument, he said. One group designed a sequencer, which is a tool for making musical patterns, he said. Another group created a frequency modulation synthesizer, which manipulates sounds to create new sounds. The third instrument is a sampler and looper, which records sound in real time and applies certain operations to the sound, Gran said. All three of the instruments are designed to be used live, and two of them will be demonstrated at the presentation with live performers from the music department, he said.

Gran said he wants to make people aware of electronic music and the work that goes into creating it. The difficulty with electronic music is relating it to the natural world, but by thinking about the synthesis of sound, he said students start thinking about the fundamental nature of music, Gran said.

"It's about participating in the kinds of ways of thinking about music ... Even just having a sound and thinking about 'what's the quality of this sound, how loud or soft is it' — all of those things have to be designed and considered when you're synthesizing sound, so you really get down to the essence of the physical elements that make music," he said.

Sophomore Jonny Deneke, a math and computer science major, said he has been involved with music his entire life, but is not involved with any music groups on campus. When he received an email from his computer science professor about a research group looking for interested computer science and music students, he jumped at the opportunity.

Since then, he has spent five hours each week working with his partner to create an additive synthesizer and sequencer, Deneke said. The instrument basically is a computer program, he said, so it has been his job to write the code creating it. Working with a student from the music department has taught him about interdisciplinary collaboration and the overlap between music and math, he said.

"Music is a form of math, essentially, a creative form," Deneke said. "It's been interesting, especially since I've taken music theory courses. I know a lot of the things [my partner] is talking about and they've been able to provide insight as to, 'Oh, what kind of things do we want this to do to make it easier to use?'"

Junior computer science major Steven Goldberg said he had a similar relationship with his research partner. As a former member of the drumline during high school and at Truman, he said he didn't know much about harmonics or the way different pitches work, so his music major partner was able to offer input about how to make the instrument sound better. He said it also was useful to work with a music student when they wanted to test the sampler they were making.

Goldberg said in addition to learning about music and how it works, he has learned about its relationship to computers, such as the way computers handle sound waves. He said he also gained experience programming with a partner. This was the first long-term computer science project he has collaborated with a partner to complete, and he said working with a music student was a fun way to experience that.

"I didn't know there were music people at Truman who are interested in computer science and I didn't know any computer science people who were also interested in music," Goldberg said. "I'm glad there are, though, because I think it's a good experience."

Students register to donate marrow

BY EMILY WICHMER
Staff Reporter

Truman State students chose to make a donation on Wednesday, but instead of swiping their credit cards to do it, they swiped their cheeks.

Staci Latham, Fitness and Wellness Director at Truman, said she was inspired to become involved with bone marrow donation after her father's bone marrow transplant. Latham contacted "Do Something," an organization that gets teens involved with national charitable campaigns. Through the organization's campaign, "Give a Spit," Latham hosted a drive to find potential bone marrow donors from 11 a.m. to 2 p.m. in the SUB Alumni Room on Wednesday. Campus organizations and student volunteers swabbed the inside of participants' cheeks with cotton swabs to get saliva samples, Latham said. She said these samples will be used to determine whether that person is a match for someone in need of a bone marrow transplant.

Latham said two years ago, her father was diagnosed with myelodysplastic syndrome, a disease that causes blood cells in the patient's body to die, and needed a bone marrow transplant to survive. Latham said his condition was so rare, he didn't have a living match, so he received two umbilical cord donations that saved his life.

Since then, Latham has wanted to fill the pool of donors in the hope that people with rare bone marrow typing won't struggle as much to find a donation, she said. She said she thinks it's important for college students to get involved because the prime donors for the registry are ages 18 to 44. Latham said people in that age group are more likely to be matches for those in need of a transplant.

"To be a living donor is a pretty amazing thing," Latham said. "I don't think many people get that opportunity to give a life-saving gift and still be alive to see it benefit someone. To sign up to become a member is a completely painless process, as long as you don't mind the inside of your cheek being swabbed."

Latham said many people mistakenly think donating bone marrow is a painful and invasive process. Ultimately, it's an inconvenience, but it's not as invasive as people think, Latham said. She said there are two ways to donate bone marrow. The most common procedure is a non-invasive procedure called Peripheral Blood Stem Cell transplantation and is just like giving blood. The other, more invasive procedure, isn't as commonly used, Latham said. During this procedure, donors are given anesthesia, and doctors surgically extract bone marrow from the donor. Latham said the doctor of the patient receiving the donation decides which is the best for the patient and that determines which procedure is used.

To request a free bone marrow donor registration kit, visit www.bethematch.org

Just because participants are on the registry doesn't mean they will be called to donate right away, Latham said. She said she has been on the registry list for 10 years and has yet to be called as a match, but she's willing and available if she is called.

Junior Kristine St. Gemme said she was called to donate soon after signing the registry. She got a phone call from the registry a month and a half ago, saying she was a close match for someone. St. Gemme said the next day she went to the Northeast Regional Medical Center and had some blood work done. Two weeks later, they called her and said she was a match. She donated her bone marrow during Thanksgiving Break, she said.

St. Gemme said she first decided to become a donor after being denied permission to donate blood because she was slightly anemic. She said after being told no at one of the blood drives on campus, she decided that if she couldn't donate blood, she would find some other way to help.

She said the donation process lasted three weeks, as opposed to the usual length of three months. St. Gemme said the reason for this was because her match needed the transplant as soon as possible.

Five days before the donation, doctors gave her a shot of Filgrastim in each arm to draw the bone marrow out of her bones and into her blood stream, she said. On the day of the donation, she flew to Denver, Colo., and prepared to undergo the more common form of bone marrow donation, the Peripheral Blood Stem Cell transplantation method. She said doctors used something similar to a dialysis machine that filtered out her bone marrow from one arm and pumped her blood back into her other arm. She said the procedure wasn't very painful and everything was paid for by the organization, but the donation was time-consuming and lasted five hours.

St. Gemme said having many donors is vital to the process, because matches for bone marrow often are difficult to find. She said bone marrow isn't like blood, where there are different types. She said there are several factors that go into it, like racial and ethnic backgrounds.

St. Gemme encourages people to make an informed decision. She said she encourages those thinking about donating to talk to someone who has donated before and find out more about the process before making a decision.

Senior Andrew Zeiler, a pre-med biology major, said he thinks more people should consider donating bone marrow.

"I am entirely for bone marrow transplants," Zeiler said. "They are not life-threatening to the donor and can save people's lives. It has an incredible impact on the recipient and can help treat leukemia and lymphoma."

For anyone who missed the drive, you can go to www.bethematch.org and request a free kit in the mail. It's free to register and it contains everything necessary to determine whether you are a match for someone.