STANFORD TECHNOLOGY BRAINSTORM

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INSIDE THIS ISSUE

Yamaha and Stanford Make Beautiful Music Together

By David F. Salisbury,
Science Writer,
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Electronic musical instruments, computers, video games and karaoke may never sound the same.

Stanford University's Office of Technology Licensing (OTL) and Yamaha Corporation have announced a joint licensing program for a type of music synthesis that could dramatically improve the quality of computer-generated sound.

At a news briefing held in Tressider Union at Stanford University on July 9, university and Yamaha officials announced that they are pooling their patents and patent applications on a type of music synthesis called physical modeling. The new licensing program will be known as Sondius-XG™.

Physical modeling produces sound by generating a mathematical simulation of actual musical instruments, rather than modeling the sounds alone. The approach allows performers to duplicate the performance nuances, such as over-blowing or variations in vibrato, that are possible with real music instruments.

It also allows computer musicians and others to create and play new instruments that could never exist in nature, such as a flute played with a violin bow or a 20-foot-long clarinet. The technology also can be applied to reproducing realistic sound effects, like doors slamming and cars screeching around corners.

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SONDIUS-XG™

The new Sondius-XG™ logo will be appearing on computer music products soon! Look for this mark to experience the ultimate in realistic computer sound.

Informational Sessions

Stanford's Office of Technology Lisensing (OTL) still holds informational sessions for people with questions about the office and the licensing process. The sessions are held every Friday, 10:00 - 12:00, at 900 Welch Road, Suite 200 (our new conference room). All are welcome at any session, but if possible, please call us in advance at 723-0651 to inform us you will be attending.

The big 5-0!

You are invited to celebrate with Stanford University's Office of Technology Licensing the achievement of a significant milestone: 1996-1997 Revenue in excess of $50,000,000! The event will be held at Stanford's Alumni Grove on September 3 from 4:30 pm to 7 pm. To RSVP and for directions, please call Blanca or Peggy at (650) 723-0651. We look forward to seeing you there!

Stanford University
Technology Transfer Through Licensing
Office of Technology Licensing

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Stanford Technology BRAINSTORM is published quarterly in order to provide information about OTL and general information of interest to the licensing community, both within and outside Stanford.

OTL's services are available to any Stanford faculty, students, or staff who invent technologies which may benefit the public or be of commercial value.

To learn about a specific technology or to disclose one of your own, contact us at the above address.

Yamaha, Stanford Make Beautiful...

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"Stanford and its faculty believe in both the basic research that underlies most advances, and in the transfer of knowledge and technology to society," said Stanford University President Gerhard Casper. "This innovative technology, and the resulting partnership with Yamaha, signify that dedication to research and to fostering its practical uses and benefits."

Mr. Masatada Wachi, director of the new program for Yamaha, described it as a "path-making endeavor" for the company.

The joint licensing program grants the use of more than 400 patents and patent applications. These include basic patents for physical modeling synthesis developed at Stanford's Center for Computer Research in Music and Acoustics and previously marketed by Stanford under the name Sondius® and by Yamaha as Virtual Acoustic® (VA).

The portfolio also includes patents and applications covering Yamaha's XG format, a set of rules for tone generation that extends MIDI, the standard communication interface among electronic instruments.

Gary Leuenberg, a professional musician who consults with Yamaha, demonstrated the new technology at the briefing. When he tried the equipment for the first time, he said "I couldn't put it down. Not only does it sound wonderful, but it behaves like a real acoustical instrument."

The Sondius® program was Stanford's first effort to not only patent discoveries made on campus but to trademark them as well. A patent is only granted for a 20-year period. When it expires, the patent-holder loses all rights to his invention. Trademarks can be maintained indefinitely and can grow in value as they become well known and associated with quality products.

An example is the Dolby Company's trademark on their audio noise reduction process. Electronics companies pay Dolby about $15 million per year to put the Dolby trademark on their products.

"The development of Sondius, started in 1993, was a major experiment for OTL," says Mary K. Watanabe, the OTL associate handling the program. "This major collaboration with Yamaha is a validation of this approach, as well as an important second step."

Under the new agreement, licensees pay a flat fee for the entire portfolio that is less than the maximum fees charged by the previous programs. "This makes things much easier for our licensees. They are not always certain which specific patents they will use in developing new products. With the new program, they will not have to pick and choose," Watanabe said.

The joint agreement represents a new type of relationship between Stanford and Yamaha. It is the first time that Stanford has entered into a joint agreement of this magnitude with a corporation. As far as OTL officials can determine, it is the first relationship of its type between a U.S. university and a private company.

Stanford and Yamaha have a long-standing business relationship that began in 1975 when Stanford granted Yamaha a license for its Frequency Modulation (FM) Synthesis, developed by Stanford professor of music, John Chowning. With considerable investment on its part, Yamaha used FM synthesis to develop products such as the world's first fully digital synthesizer and an FM synthesizer chip found on the sound boards that give many personal computers audio capability.

"It's not every day that an international corporation joins forces with a world-class university in this way," said Kazukiyo Ishimura, president of Yamaha. "We're delighted with our renewed partnership with Stanford and are excited about the promise of Sondius-XG."

Stanford's FM synthesis patent, which expired two years ago, was the second biggest money maker in campus history, bringing in more than $20 million. OTL officials hope that Sondius-XG™ will ultimately reap an even bigger dividend for the campus.

To Charles Kruger, dean of research, the program is an outstanding example of how industry and universities can work together. Yamaha took the basic research on FM synthesis performed at CCRMA and turned it into real products. Most of the royalties that Yamaha paid to Stanford went to support research and teaching at CCRMA. One result was the advances in physical modeling that form the basis for the new technology and the new agreement, he said.

"This cycle of basic research leading to new products, producing royalties that support new research that lead to product improvements is a win-win situation for everyone," Kruger said.

The new licensing program will be administered by OTL. For more information, please call our office, visit the website at www.Sondius-XG.com or e-mail Mary Watanabe at license@sondius-xg.com.

A Sampling of Licenses Granted by OTL in the Last Quarter

Docket(s)	Title(s)	Uses	Licensee(s)	License Type
S74-043	"Cohen-Boyer Recombinant Technology"	DNA Cloning – Production of proteins Total number of DNA licensees: 365	Phytera, Ontogeny, Vion Pharmaceuticals, Neomarkers, Copernicus Gene Systems, Athersys, Affymetrix	Non-exclusive
S76-074	"Monolithic Semiconductor Switching Devic"	IGBT's	Motorola	Non-exclusive
S81-026	"Phycobiliproteins (PE)"	Diagnostics	ProZyme, Biogenesis, Miltenyi Biotech	Non-exclusive
S87-012	"Amplification of Target Polynucleotide Sequences"	PCR Alternative	Organon Teknika Gen-Probe	Co-exclusive
S92-180	"Mono. Antibody Against GST"	Analyze Proteins	BabCo	Non-exclusive
S94-044	"Detecting Pathogens w/ Light"	Drug Screening	Xenogen	Exclusive
S94-133	"Protein-Protein Interaction..."	Drug Screening	Neurex Corporation	Exclusive
S94-153	"Assay for Sepsis in Neonates"	Diagnostic	CompuCyte	Exclusive
S96-139	"Phi-NX Cell Lines"	Retroviral Screening	Genentech, Pfizer	Non-exclusive
S96-169	"Flow Cytometry Analysis"	Software	Treestar, Inc.	Exclusive
S96-186	"Helicase Assay for Herpes"	Viral Screening	Smith-Kline-Beecham	Non-exclusive

Staccato Systems Bursts onto the Sondius-XG™ Scene

By David F. Salisbury,
Science Writer, Stanford University News Service

Staccato Systems is the first licensee of Sondius-XG™ (see story, page 1). In true Silicon Valley tradition, it got its start in a garage in Mountain View and will soon be moving to commercial quarters.

Staccato was formed by Pat Scandalis and Nick Porcaro, who worked on waveguide synthesis as visiting scholars at CCRMA (Center for Computer Research in Music and Acoustics) before leaving to form the new company; David A. Jaffe (D.M.A. 1982), a composer who pioneered physical modeling synthesis at CCRMA in the early 80's in such works as "Silicon Valley Breakdown"; Scott Van Duyne and Tim Stilson, who are finishing up their doctoral degrees at CCRMA; Julius O. Smith III, an associate professor of music at Stanford and inventor of Digital Waveguide Synthesis; and Joe Koepnick, currently on leave from his position as a senior associate at OTL.

The keystone of much of the original Sondius® technology is a powerful prototyping tool called SynthBuilder which is licensed to Staccato. The software was developed at CCRMA for the NEXTSTEP Operating System.

Last month, SynthBuilder won the Grand Prize at the Second Annual International Music Software Competition, sponsored by the International Institute for Electroacoustic Music in Bourges, France.

Staccato is currently adapting SynthBuilder to run on Windows and Macintosh personal computers. The software allows users to design their own custom instruments, sound effects and sound processing algorithms. It uses a graphical interface that allows the user to drag and drop icons representing different parts of a virtual instrument around on the screen and to connect them in different ways.

An underlying layer of software, called the MusicKit, interfaces with signal processing hardware to convert the graphical representations into synthesized sound. MusicKit was developed by CCRMA and NeXT Corporation.

A person designing a piano, for example, drags an icon representing a piano string onto the active portion of the screen. Then the designer connects another icon representing the piano hammer to the string. After this is done, the designer can play the virtual piano by clicking on a musical score or playing an attached keyboard.

To get fancy, the designer can add icons representing other effects such as reverb, or replace the piano hammer with a violin bow or flute embouchure to create new kinds of virtual instruments. The designer can use the program to create a number of different instruments, enough to assemble a string quartet, dance band or 100-piece orchestra.

More importantly, from a developer's perspective, users can get "inside" the piano string or hammer and design and test new and different synthesis models.

The company will explore potential Internet applications as well, the founders say. The information required to produce a sound using physical modeling is a fraction of that required to produce it using the digitized sound files that are currently in vogue. A computer equipped with Sondius-XG ™ technology could therefore receive and reproduce sound files much more rapidly, even in real time, if its processor is fast enough.

Please note our area code has changed! As of August 2, Stanford and the surrounding regions' new area code is 650.

OTL Hires Two More Associates to Help With Growing Caseloads

Stanford's Office of Technology Licensing is proud to welcome its two new associates, Linda Chao and Jessica Smith. OTL is very excited that Linda and Jesse decided to join us. We know you will enjoy working with them.

Jesse is the newest addition to the biotechnology crew at OTL, becoming the third associate for this group of technologies. She returns to Stanford after two years of work at Alza Corporation in their Gene Delivery group.

Jesse grew up in Florida and spent her undergraduate years at Duke University. Though starting her Duke career as a Classics major, she explored other interests and received her B.S. in Zoology in 1990.

Jesse then moved to sunny California where she continued her studies in the Cancer Biology program at Stanford University. Her research in the laboratory of Associate Professor Michele Calos of the Genetics Department focused on DNA replication origins in mammals, flies and yeast.

Having completed her Ph.D. in 1995, Jesse went to work for Alza in the Gene Delivery group. Due to their small size, the gene therapy group collaborated with a variety of other gene therapy companies. Jesse donned multiple hats, "On the one hand evaluating technology from other companies, on the other doing rat surgery!"

The reasons are numerous for Jesse's switch to the OTL venue. Having already explored scientific research in depth, Jesse wanted to spend more time utilizing and developing other skill sets.

"There is a lot of interest and value in transfering technology to companies...the climate is right, especially in the Bay Area. Maybe technology transfer is happening more often because of the number of start-up companies; people see their neighbor starting a company and there becomes an attitude of 'Why can't I?'"

Jesse has not only made a recent career move, but a marital status one as well. On July 5th, she and Paul Voois, Executive Vice President of Technology at 8 x 8, Inc., were married in Florida. We hope both of these new beginnings bring Jesse much happiness and adventure. ♠

Linda joins OTL as the new Associate responsible for Electrical Engineering and Computer Science technologies. She brings to Stanford 8 years of technical and business experience in the semiconductor industry.

After graduating with a B.S. in Electrical Engineering from M.I.T., Linda worked on design teams for Digital Equipment Corporation's VLSI chips and received 2 patents.

After working on the first design of the Alpha microprocessor, Linda felt she needed a new direction. To expand her knowledge in business as well as technology, she returned to M.I.T. to attend the Leaders for Manufacturing Program where she received an M.S. in Management in conjunction with an M.S.E.E.

To apply her business and technical background, Linda then accepted a two-year assignment at SEMATECH, the U.S. semiconductor industry consortium located in Austin, TX. While enjoying the barbecue ribs and interacting with people from different companies, she analyzed foreign competitors' activities.

Continuing westward, she then accepted a product marketing position at Applied Materials in Santa Clara, CA. Through Linda's traveling overseas and working closely with customers in Taiwan and Southeast Asia, her division penetrated new markets and its sales increased.

"But at that point I had spent 8 years in the same industry. I wanted an opportunity to see a lot of different technologies and to help bring more products to market," says Linda. The chance came when Mona Wan, a Senior Associate at Stanford's OTL, and Linda had a mutual friend who told Linda of the opening at OTL. The fit appears perfect.

Linda has enjoyed her first months at OTL, especially speaking with inventors "because they love talking about what they're doing." As part of the Stanford community, she looks forward to working with inventors and industry to transfer leading edge technologies. ♠

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