

Education

University of Victoria, Victoria, BC, Canada

Doctor of Philosophy in Interdisciplinary Studies combining Electrical and Computer Engineering, Computer Science, Mechanical Engineering, Music & Psychology, November 2007

- Ord and Linda Anderson Interdisciplinary Fellowship. (GPA: A+)
- Dissertation: Digitizing North Indian Performance: Extension and Preservation Using Multimodal Sensor Systems, Machine Learning & Robotics.

Princeton University, Princeton, NJ, USA

Bachelor of Science and Engineering in Computer Science, June 2002

- Graduated with Honors in Computer Science. (CS GPA: A-)
- Elected to the Society of Sigma XI for excellence in research.
- Senior Thesis: Invented the Electronic Tabla MIDI Controller. Received the Calvin Dodd MacCracken Senior Thesis/Project Award.

Experience

California Institute of the Arts, Valencia, CA

9/2007-Present

Professor/Music Technology Coordinator

- Redesign Curriculum for educating students in state of the art music technology. Teach courses in Programming, Digital Signal Processing, Human Interface Design, and Robotics for Musical Performance.
- Research on digitizing North Indian musical performance for pedagogical applications and modern multimedia productions.

University of Victoria, Victoria, BC, Canada

1/2004-12/2007

Director/Founder of MISTIC

- Director & Founder of Music Intelligence & Sound Technology Interdisciplinary Centre (MISTIC). This is a research group of professors, graduate students, undergraduate students, composers, and engineers collaborating together to build state of the art music technology for creating 21st Century music.
- Lead team on research to digitize human gestures from musical performers. Planned annual concerts exhibiting teams research and new compositions.

Princeton University, Princeton, NJ
Music Technology Researcher and Developer

6/2001-1/2004

- Networked Electronic Dholaks (Indian drums) for simultaneous performance in multiple locations. To be published in Journal New Instruments for Musical Expression 2003 and showcased in a collaborative musical performance taking place simultaneously at McGill University in Canada, and Princeton University in the United States, in May 2003.
- Developed a system to digitally capture gestures from a sitar player motions during a performance using a microcontroller. This technology evolved into the Electronic Sitar MIDI Controller.

ALK Technologies, Princeton, NJ
Intern - Software Developer

5/2001-7/2001

- Programmed Data Enhancing features for GPS software used on PDAs.
- Created new Polygon C++ Class to enhance traffic routing software.

Readers Digest Association, Pleasantville, NY
Project Manager

6/1999-8/1999

- Designed and programmed the first online Hangman game for the company web page.
- Managed six team members to accomplish live production of the game within 10 weeks.
- Researched and evaluated emerging internet technologies for New Media Department.

IBM Global Services, North Castle, NY
Intern

6/1998-8/1998

- Planned, coordinated and managed the work effort to convert 150 desktops and Thinkpads from OS/2 to the Windows 95 e-business platform. Completed the conversion within 10 weeks; ahead of plan and with high customer satisfaction.

Engineering Skills

Programming: C/C++, Java, Visual BASIC, Pascal, SQL, PERL, CGI SCRIPTS, MS Visual Studio, Matlab, OPENGL, Macromedia Flash, HTML, Unix/Linux, Windows, Macintosh
Electrical Engineering: Microprocessor-based circuit design (PIC, Basic Stamp, Atmel); sensor technology, digital signal processing
Mechanical Engineering: Robotic design (motors, solenoids, gears)
Audio: Pure-Data, MAX/MSP, Chuck, Marsyas, ProTools

Publications

BOOK

Kapur, A. *Digitizing North Indian Music: Preservation and Extension using Multimodal Sensor Systems, Machine Learning and Robotics*, VDM Verlag Dr. Muller, Germany, 2008. ISBN-13: 978-3639060973.

REFEREED JOURNAL PAPERS

Tzanetakis G., Kapur, A., Schloss, W.A., & M. Wright. "Computational Ethnomusicology", *Journal of Interdisciplinary Music Studies*, 1(2), pp. 1-24, 2007.

Kapur, A., Wang, G., Davidson, P., & P.R. Cook, "Networked Performance: A Dream worth Dreaming?", *Organised Sound*, 10(3), pp. 209-219, October 2005.

Kapur, A., Davidson, P., Cook, P.R., Driessen, P.F. & W.A. Schloss, "Preservation and Extension of Traditional Techniques: Digitizing North Indian Performance", *Journal of New Music Research*, 34(3), pp. 227-236, September 2005.

Kapur, A., Davidson, P., P.R. Cook, P.F. Driessen, & W.A. Schloss, "Evolution of Sensor-Based ETabla, EDholak, and ESitar", *Journal of ITC Sangeet Research Academy*, vol. 18, Kolkata, India, November 2004.

Kapur, A., Essl, G., Davidson, P. & P. R. Cook, "The Electronic Tabla Controller", *Journal of New Music Research*, 32(4), pp. 351-360, 2003.

REFEREED CONFERENCE PAPERS

Vallis, O., Hochenbaum, J., & A. Kapur. "Extended Interface Solutions for Musical Robotics", *Proceedings of the IEEE International Symposium on Multimedia. Berkeley, USA, December 2008*.

Kapur, A., Eigenfeldt A., Bahn, C., & W.A. Schloss. "Collaborative Composition for Musical Robots", *Proceedings of the International Conference on Digital Arts, Porto, Portugal, November 2008*.

Eigenfeldt, A., & A. Kapur. "Multi-Agent Multimodal Performance Analysis", *Proceedings of the International Computer Music Conference*, Belfast, U.K., August 2008.

Eigenfeldt, A., & A. Kapur. "An Agent-based System for Robotic Musical Performance", *Proceedings of the International Conference on New Interfaces for Music Expression*, Genoa, Italy, June 2008.

Benning, M., Kapur, A., Till, B., and G. Tzanetakis. "MultiModal Sensor Analysis on Sitar Performance: Where is the Beat?" *Proceeding of the IEEE International Workshop on Multimedia Signal Processing*, Crete, Greece, October 2007.

Kapur, A., Percival, G., Lagrange, M., and G. Tzanetakis. "Pedagogical Transcription for Multimodal Sitar Performance," *Proceedings of the International Conference on Music Information Retrieval*, Vienna, Austria, September 2007.

Kapur, A., Trimpin, Singer, E., Suleman, A., and G. Tzanetakis. "A Comparison of Solenoid-Based Strategies for Robotic Drumming," *Proceeding of the International Computer Music Conference*, Copenhagen, Denmark, August 2007.

Benning, M., Kapur, A., Till, B., Tzanetakis, G., and P. F. Driessen. "A Comparative Study on Wearable Sensors for Signal Processing on the North Indian Tabla," *Proceedings of the IEEE Pacific Rim Conference on Communications, Computers and Signal Processing*, Victoria, Canada, August 2007.

Kapur, A., Singer, E., Benning, M. S., Tzanetakis, G. and Trimpin. "Integrating Hyperinstruments, Musical Robots, & Machine Musicianship for North Indian Classical Music," *Proceedings of the International Conference for New Interfaces for Musical Expression*, New York, USA, June 2007.

Kapur, A., Tzanetakis, G., Schloss, A., Driessen, P.F., & E. Singer, "Towards the One-Man Indian Computer Music Performance System," *Proceedings of the International Computer Music Conference*, New Orleans, USA, November 2006.

Kapur, A., Tindale, A.R., Benning M.S., & P.F. Driessen, "The KiOm: A Paradigm for Collaborative Controller Design," *Proceedings of the International Computer Music Conference*, New Orleans, USA, November 2006.

Kapur, A. & E. Singer, "A Retrieval Approach for Human/Robot Musical Performance," *Proceedings of the International Conference on Music Information Retrieval*, Victoria, Canada, October 2006.

Tzanetakis, G., Kapur A., & A.R. Tindale, "Learning Indirect Acquisition of Instrumental Gestures using Direct Sensors," *Proceedings of the IEEE Workshop on Multimedia Signal Processing*. Victoria, Canada, October 2006.

Kapur, A., "21st Century Ethnomusicology", *Proceedings of Music and the Asian Diaspora*, Princeton, New Jersey, April 2006. [Invited Keynote Speaker](#).

Tzanetakis, G., Kapur A., & R.I. McWalter, "Subband-based Drum Transcription for Audio Signals," *Proceedings of the IEEE International Workshop on Multimedia Signal Processing*. Shanghai, China, November 2005.

Kapur, A. "Past to Present: Evolution and Preservation of Traditional Techniques using Computer Music Theory", *MusicAcoustica*, Beijing, China, October 2005.

Kapur, A., Kapur, A., Virji-Babul, N., Tzanetakis, G. & P.F. Driessen, "Gesture-Based Affective Computing on Motion Capture Data", *Proceedings of the International Conference on Affective Computing and Intelligent Interaction*. Beijing, China. October 2005.

Kapur, A., Tzanetakis, G., Virji-Babul, N., Wang, G., & P.R. Cook, "A Framework for Sonification of Vicon Motion Capture Data", *Proceedings Of the International Conference on Digital Audio Effects*, Madrid, Spain, September 2005.

Kapur, A., McWalter, R. I., & G. Tzanetakis, "New Music Interfaces for Rhythm-Based Retrieval", *Proceedings of the International Conference on Music Information Retrieval*, London, England, September 2005.

Kapur, A., "A History of Robotic Musical Instruments". *Proceedings of the International Computer Music Conference*. Barcelona, Spain, September 2005.

Driessen, P., Schloss, W. A., Tzanetakis, G., McNally, K. & A. Kapur, "Studio Report: University of Victoria Music Intelligence and Sound Technology Interdisciplinary Centre (MISTIC)". *Proceedings of the International Computer Music Conference*. Barcelona, Spain, September 2005.

Kapur, A., Yang, E.L., Tindale, A.R., & P.F. Driessen, "Wearable Sensors for Real-Time Musical Signal Processing". *Proceedings of the IEEE Pacific Rim Conference*. Victoria, Canada. August, 2005.

Tindale, A.R., Kapur, A., Tzanetakis, G., Driessen, P.F., & W. A. Schloss, "A Comparison of Sensor Strategies for Capturing Percussive Gestures", *Proceedings of the International Conference on New Interfaces for Musical Expression*. Vancouver, Canada, May 2005.

Wang, G., Misra, A., Kapur, A., & P.R. Cook, "Yeah, CHUCK IT=> Dynamic, Controllable Interface Mapping", *Proceedings of the International Conference on New Interfaces for Musical Expression*, Vancouver, Canada, May 2005.

Tindale, A.R., Kapur, A., Tzanetakis, G., & W.A Schloss, "Indirect Acquisition of Percussion Gestures Using Timbre Recognition," *Proceedings of the Conference on Interdisciplinary Musicology*, Montreal, Canada, March 2005.

Kapur, A., Davidson, P., Cook, P. R., Driessen, P., & W. A. Schloss, "Digitizing North Indian Performance", *Proceedings of the International Computer Music Conference*, Miami, Florida, November 2004. [*Winner of the Journal of New Music Research Distinguished Best Paper Award ICMC 2004.*](#)

Tindale, A., Kapur, A., & I. Fujinaga, "Towards Timbre Recognition of Percussive Sounds", *Proceedings of the International Computer Music Conference*, Miami, Florida, November 2004.

Kapur, A., Benning, M., & G. Tzanetakis, "Query-By-Beat-Boxing: Music Retrieval for the DJ", *Proceedings of International Conference on Music Information Retrieval*, Barcelona, Spain, October 2004.

Tindale, A., Kapur, A., Tzanetakis, G., & I. Fujinaga, "Retrieval of Percussion Gestures Using Timbre Classification Techniques", *Proceedings of International Conference on Music Information Retrieval*, Barcelona, Spain, October 2004.

Kapur, A., Tzanetakis, G., & P.F. Driessen, "Audio-Based Gesture Extraction on the ESitar Controller", *Proceedings of Conference on Digital Audio Effects*, Naples, Italy, October 2004.

Kapur A., "Digitizing to Preserve Traditional North Indian Technique", *Society of Ethnomusicology Northwest Chapter Meeting*, Victoria, BC, February 2004. *Winner: Thelma Adamson Best Student Paper Award SEM 2004.*

Kapur, A., Lazier, A., Davidson, P., Wilson, R. S., & P.R. Cook, "The Electronic Sitar Controller", *Proceedings of the International Conference on New Instruments for Musical Expression*, Hamamatsu, Japan, June 2004.

Kapur, A., Essl, G., Davidson, P. & P. R. Cook, "The Electronic Tabla Controller", *Proceedings of the International Conference on New Interfaces for Musical Expression*, Dublin, Ireland, pp. 77-81. May 2002.

DISSERTATION

Kapur, A. "Digitizing North Indian Music: Preservation and Extension Using Multimodal Sensor Systems, Machine Learning and Robotics." *Doctor of Philosophy*, Interdisciplinary combining Departments of Computer Science, Electrical Engineering, Mechanical Engineering, Music & Psychology, University of Victoria, November 2007.

SENIOR THESIS

Kapur, A. "The Electronic Tabla Controller." *Senior Thesis*, Computer Science Department, Princeton University, May 2002. *Winner: Calvin Dodd MacCracken Senior Thesis/Project Award.*

E-JOURNAL PAPERS

Davidson, Philip, Kapur, Ajay, & Perry R. Cook, "A System for Generating Real-Time Visual Meaning for Live Indian Drumming", *Refractory: A Journal of Entertainment Media, Special Edition: The Sounds of Vision, Spectatorship and Aural Perception*, 2004.

Selected Festival/Conference Musical Performances

Kapur, A. & C. Bahn, "Concert for NID," *National Institute of Design*, Bangalore, India. December 19, 2008.

Kapur A. & A. Eigenfeldt, "Rajas Gunas", *International Conference on Digital Arts*, Porto, Portugal, November 7, 2008.

Kapur, A. "Live Coding vs. Indian Electronica", *International Computer Music Conference*, Belfast, Ireland. August 25, 2008.

Kapur, A., "Twilight", *Australasian Computer Music Conference*, Sydney, Australia, July 12, 2008.

Kapur, A., Bahn, C., Brown, J., & M. S. Benning, "KarmetiK Collective with the MahaDeviBot", *International Jazz Festival*, Victoria, BC, Canada, June 28, 2008.

Kapur, A., Bahn, C. & A. Eigenfeldt. "MahaDeviBot Sessions", *NUS Arts Festival*, Singapore, Feb 24, 2008.

Kapur, A. and C. Bahn. "MahaDeviBot with E-Sitar & E-Dilruba", *Carnival of e-Creativity & Change-Agents Conclave*, New Delhi, India. Feb 16, 2008.

Kapur, A., "Anjuna's Digital Raga", *International Computer Music Conference*, Copenhagen, Denmark, August 27, 2007.

Kapur, A., Minhas, S., Brown, J., Benning, M. S. & E. Brown, "KarmetiK Underground with the MahaDeviBot", *International Jazz Festival*, Victoria, BC, Canada, June 30, 2007.

Kapur, A., & C. Bahn, "Digital Sankirna for MahaDeviBot, E-Sitar and E-Dilruba", *International Conference for New Interfaces for Musical Expression (NIME 2007)*, New York, NY, June 9, 2007.

Kapur, A., "Digital Sankirna", *NUS Arts Festival*, Singapore, March 11, 2007.

Kapur, A., Davidson, P., & A. Lazier, "Saraswati's ElectroMagic", *International Conference for New Interfaces for Musical Expression (NIME 2004)*, Hamamatsu, Japan, June 4, 2004.

Kapur, A., Davidson, P., & A. Lazier, "Saraswati's ElectroMagic", *Listening in the Sound Kitchen International Computer Music Festival (LITSK 2003)*, Princeton University, November 14, 2003.

Kapur, A., Cook, P. R., Wang, G., Davidson, P., Trueman, D., Park, T. H., & M. Bhargava, "Gigapop Ritual: A Live Networked Piece for 2 Electronic Dholaks, Digital Spoon, DigitalDoo, 6-string Electric Violin, Rbow, Sitar, Tabla, and Bass Guitar." Performed Live at Princeton University and McGill University at the *International Conference for New Instruments for Musical Expression (NIME 2003)*. Montreal, Canada, May 23, 2003.