CARTAH/SMCC Studio Report
Richard Karpen (karpen@u.washington.edu), Juan Pampin (pampin@u.washington.edu), Bret Battey (bbattey@u.washington.edu), Chad Kirby (ckirby@u.washington.edu)

Center for Advanced Research Technology in the Arts and Humanities
University of Washington, Seattle, WA 98195
http://www.washington.edu/cartah

Introduction
CARTAH and SMCC are two affiliated centers at The University of Washington supporting digital arts research and creation, including computer music.

CARTAH—The Center for Advanced Research Technology in the Arts and Humanities—is a center in the College of Arts and Sciences at the University of Washington in Seattle. The Center serves a diverse group of faculty and students engaged in technology-based creative work and research. Digital video, animation art, multimedia installations, and computer music are all areas of work being undertaken at CARTAH. The Center also has a strong component of Humanities research, concentrating especially on issues of multimedia databases and archiving.

SMCC—The School of Music Computer Center facilities, recently integrated as part of CARTAH, are designed primarily to support artistic creation and research in the realm of software synthesis, digital signal processing, and algorithmic composition.

The CARTAH community consists of faculty, students, staff, and visiting artists and scholars from Music, Art, Architecture, Language Studies, Computer Science and other areas.

Faculty, Staff, Graduate Students and Visitors include: Richard Karpen, Professor of Music, Director of CARTAH; Paul Berger, Professor of Art; Juan Pampin, Research Associate/Lecturer, Computer Music; Michael O’Malley, Research Associate/Lecturer Digital Video; Chad Kirby and Mark Haslam Technical Coordinators; Stacy Waters, Humanities Research Coordinator; Bret Battey, Linda Antas, and Eric Rynes Graduate Assistants, Computer Music, Neil Chowdhury, Peter Bill, Graduate Assistants, Digital Imaging and Video; Pau Bofil, Visiting Scholar, Barcelona; Gabriel Prokofiev, visiting composer, UK (1999); Ian Stewart, visiting composer, Canada (2000).

Studios
CARTAH/SMCC has studios and labs optimized for computer music and digital video/animation. We are primarily using PC’s running Linux and Macintosh computers for both audio and video work. The centers contain around 70 computers, around 30 of which are primarily used for computer music and digital video research, production, and teaching. There are several multi-channel listening spaces, a “teaching” studio where classes and presentations are held. Most of our computer music work uses Lisp (Common Music, CLM), Csound and SuperCollider. We also have MAX/MSP, and the IRCAM Forum package of software as well as some of our own.

Peripherals at CARTAH include a new DVD Writer, numerous CD writers as well as state-of-the-art high-resolution image scanning and video capture hardware and software, color and large format printers and an array of multi-channel recording and processing devices for audio/visual projects. The Center also has a Disklavier grand piano.

Academics
CARTAH supports a two-year sequence of courses in computer music, which are followed by seminars in specialized subjects. We are also developing a series
of courses in digital animation and video as well as capstone courses that combine the audio and visual domains.

In 1999 the University of Washington awarded CARTAH a major grant ($555,000) for a pilot project to develop new curricula and research in integrated Digital Arts. The funds allowed us to bring composer Juan Pampin and artist Michael O’Malley for two years and to fund graduate students, a series of guest lectures, new courses and seminars. This project also includes collaborations with Computer Science and Engineering, Art, Music, Architecture, and other areas. One year into this pilot project, it has already succeeded in its goal garnering further support that will lead towards new academic programs in Digital Arts. We plan to institute Bachelors, Masters, and Doctorate programs in Digital Arts by 2002.

**Computer Music Research at CARTAH**

Research Associate and Lecturer Juan Pampin is developing his **ATS** (Analysis – Transformation – Synthesis) system for advanced spectral transformations. The system is a library of Lisp functions for spectral Analysis, Transformation, and Synthesis of sounds. The Analysis section of ATS implements different partial tracking algorithms. This allows the user to decide which strategy is the best suited for a particular sound to be analyzed.

Pau Bofill, CARTAH visiting scholar and Professor of Computer Science at the Universitat Politecnica de Catalunya, is exploring the use of digital signal processing for the automated recognition and source separation of polyphonic music. The current scope of the project is the recognition/separation of flute duets using different time-frequency representations (ffts, wavelets) and different approaches (DSP, neural nets).

Composition doctoral student Bret Battey is researching the use of amplitude compression and pitch-shifting in feedback systems as a method of sound synthesis, the compositional use of simple chaotic oscillators arranged into hierarchically organized feedback systems, and multi-media compositions utilizing computer-realized video and algorithmic animation.

**SoundSpace** is a set of Java-based graphical tools to be used with Csound’s space unit generator, which was developed by Richard Karpen. SoundSpace is being developed at CARTAH by Technical Coordinator Mark Haslam.

http://www.washington.edu/cartah/soundspace

Graduate Assistant and violinist Eric Rynes is working with Richard Karpen and Juan Pampin to develop a sophisticated, flexible program for interactive notation quantization. The software package will facilitate the translation of algorithm to notation (in the case of algorithmic compositions) and performance to notation, offering composers a fully interactive environment.

Collaboration between CARTAH and the UW BioRobotics laboratory. Investigations are underway in the use of a 3-dimensional haptic interface as a performance controller.
**Recent compositions from CARTAH**

Linda Antas: *Still, Yet, Again* for computer-realized sound. *A River from the Walls*, for flute and computer-realized sound.


Donald Craig: *Blue Goodbye* for computer-realized sound.

Ryan Hare: *Sinfonia* for computer-realized sound.


Chad Kirby: *Ex Vitro* for didjeridu and live computer processing.


Ian Stewart: *Occam’s Razor* for computer-realized sound.

**CDCM CD Volume 32** Computer Music from CARTAH is scheduled for release in summer 2000 with Music by Linda Antas, Ron Averill, Bret Battey, Elizabeth Hoffman, Richard Karpen, Chad Kirby, and William O. Smith.

**CONCERTS 1999-2000**

April and May 1999—CARTAH/CNMAT exchange concerts.


January 2000—Computer Music from Argentina II.


July 2000—Aural Cinema/Visual Composition II.