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DXARTS Performance & Embedded Systems Technology Toolkit

Proposal ID	2007-088-1		
	Permanent Link	http://techfee.washington.edu/proposals/view/2007-088-1/	
		Department	DXArts
Non-core Access	No restrictions		
	First Application?	No	
		Student Initiated?	Yes

Abstract

The Performance & Embedded Systems Technology Toolkit is an integrated ensemble of equipment and software that augments the resources currently available at DXARTS. The Toolkit enables a wide variety of artistic research and productions involving embedded custom electronics and multimedia performative uses of technology such as the fabrication of RFID flexible/wearable custom circuits, wireless interactive projection systems, audio/video activated rapid-prototyping sculptures, dance choreography visualization, and so on. The Toolkit is synergistically organized into mutually supporting modules corresponding to design, fabrication, and performance. The research and projects that will be supported by this proposal exist at an intersection between many creative mediums and technologies. Because of our departmental first principles, our existing human and technological resources, our commitment to keeping our resources open to the UW community, and our growing partnership with other departments, DXARTS is in a unique position to support such leading edge collaborative research. This package will leverage the existing facilities and resources available through DXARTS, extend their interconnections with each other and with other departments, and act as a foundation for further integration. The proposal has been researched and written by a team of PhD candidates at the Center for Digital Arts and Experimental Media in consultation with DXARTS faculty and staff.

Background

The Center for Digital Arts and Experimental Media (DXARTS) is a degree-granting program unique to the University of Washington, designed to establish the University of Washington as one of the world's leading institutions for the creation and study of new and experimental genres of digital art and culture.

Part of our mandate is to expand access to the technologies and techniques of digital arts to as many students as possible. As detailed more extensively in our other proposal, students from a diverse range of fields populate DXARTS courses. We offer education and training in a wide array of digital arts technologies and techniques, available to the entire UW community through CARTAH. Virtually all the resources and equipment of the DXARTS program are available to any student. This includes all STF purchased resources, as well as a great deal of resources purchased through other means.

DXARTS prides itself on opening access to advanced technological tools and techniques to all students of the University of Washington, and we work to create a vibrant and active community of artists and researchers who work together from across many disciplines. To further these goals we have worked to build partnerships that bring unique resources to the University of Washington. The Student Technology Fee has been an essential partner with DXARTS and the committee has been extraordinarily supportive of our mission over the years. We believe we have returned that trust by working to ensure that not only are STF resources available to all students, but that they are stretched further by making them a part of a broader pool of value-added resources that we combine to bring the most advanced artistic and technological resources available to the all students of the University of Washington.

As DXARTS has grown, so has its ability to support and educate students in the use of higher, more specialized technologies. The Performance & Embedded Systems Technology Toolkit is a modular suite of resources meant to enable a wide variety of artistic research and productions involving embedded custom electronics and multimedia performative uses of technology. By utilizing the educational and supervisory abilities of fulltime staff and graduate students currently doing committed research in these areas, as well as by leveraging the existing resources of our design and fabrication facilities in both Raitt Hall and our Fremont Fabrication Studio, we are excited to provide student access to the leading-edge technologies represented herein.

The Performance & Embedded Systems Technology Toolkit is comprised of three modules – the Integrated Design Package (IDP), the Flex Fabrication System (FFS), and the Embedded System Performance Toolkit (ESPT). These modules are integrated to support the design, fabrication, and performance of artistic research and production across a wide range of fields. A few examples of these fields include: wearable technologies for use in performance, theatrical, site specific or mobile artworks; rapid prototyping of 3d parts for use in performance, installation, and kinetic artworks; wireless systems that can be placed on moving performers or embedded in a myriad of electronic devices within kinetic artworks; and wireless control of computer video streams for performance, installation, and field production.

Module 1, the Integrated Design Package (IDP), is a set of software tools with uses including dance/human-movement design and integration, real-time interactive multimedia control, PCB board design, and Rapid Prototype modeling. The proposed software includes Isadora, LifeForms Studio, DanceForms, Eagle CAD, SolidWorks and Rhino. This software will support student creativity across a wide variety of artistic research and production. In particular we are excited to host software that will allow deeper collaborations between DXARTS students and students from departments such as Dance, CSE, and EE.

Module 2, the Flex Fabrication System (FFS), is comprised of two fabrication systems. The first is an LKPF ProtoMat PCB Prototyping System, with which students can create custom circuit boards. This system is capable of creating not only standard PCB's but also flexible circuits such as RFID sensors that can be integrated into clothing or other space/shape-constrained locations. The second system is the Fab@Home Rapid Prototyping/CAD kit, which can be used for the purpose of quickly generating 3d parts for a wide variety of uses within kinetic or electronic art systems, performances, or installations. Fab@home is an open source initiative begun by Cornell University, which publicly shares the instructions and materials required to build a portable, light-weight, small and modifiable 3d printer for costs staggeringly lower than any market price for similar technologies.

Module 3, the Embedded System Performance Toolkit (ESPT), consists of technology to support mobile & wireless embedded network servers and a powerful video mixer capable of supporting professional-level performances, productions, and installations. Wireless computer video and the ability to embed wireless networking in a vast range of electronic devices are essential support technologies for many emerging forms of digitally integrated performances in fields such as dance, theater, and installation art.

Benefits

The Performance & Embedded Systems Technology Toolkit will give all students on campus access to industry standard tools in the realm of embedded systems that interface with all sorts of performance and artistic media. In addition, students will have access to consultants who are experts in using these tools as they benefit from training provided by DXARTS staff and graduate students, as well as from the community of students and researchers working in the DXARTS facilities.

We expect students to use the proposed resources for such diverse applications as: designing electronic clothing and other embedded, seamless, wrappable circuitry; wireless interactive video installations; dancers receiving cues from remote data and/or sending wireless data from systems embedded on their bodies; organically formed components for installation art and performances; custom circuits for all manner of electronic devices; remote wireless web server projects; virtual choreography; realtime VJing of video streams generated or captured by improvisational performances integrated with data sensing electronics; motion-captured data processing; and many more.

The simultaneous diversity and specialization of the predicted uses of these technologies are an elemental condition when doing innovative, leading-edge research in an emerging field. By making these resources available to students in a modular and integrated fashion, we can greatly benefit a large group of students by providing an environment in which to cultivate their abilities as artist-inventors.

Because the proposed fabrication resources are simultaneously highly specialized and highly diverse in their applications, many of the ways students will benefit from the Toolkit have to do with specific uses of the tools.

With the LPKF PCB prototyping system, students will be able to design, fabricate, assemble and test PCB's in a wide variety of materials including standard PCB board materials, flexible substrates and fine-pitch RF designs. These flexible circuits can be integrated into clothing or other spatially-constrained locations. Custom circuits have an unlimited number of uses within all sort of applications, both artistic and in other realms. While the training we provide is from an arts background, students from all fields will be able to gain access to our equipment. It is quite probable that students from EE, for example, will find flex PCB fabrication capability highly useful to their research.

The Fab@Home Rapid Prototyping system will be used for the purpose of quickly generating portable 3d parts for use in performance, installation, and kinetic artworks. Fab@home is an open source initiative begun by Cornell University, which publicly shares the instructions and materials required to build a portable, light-weight, small and modifiable 3d printer for costs staggeringly lower than any market price for similar technologies. Grad students in DXARTS will assemble the system, with the goal of opening up 3d printing and desktop manufacturing to students for the purpose of aiding the creation of parts for performative and installation based artworks. This technology will make it easier and simpler for all students interested in digital arts to generate parts without some of the technical overhead that high-end tools of similar output create in other departments in UW, while also giving the students exposure to tools that they may desire to learn in more technical depth at a future point in their careers at UW.

The proposed software is highly professional and commonly used in various arts and engineering industries. By making it accessible and by setting up a training protocol, students will be able to gain marketable programming skills while they are exploring and discovering their creative interests with these applications.

Isadora is a graphic programming environment that provides interactive control over digital media, with special emphasis on the real-time manipulation of digital video. Because every performance or installation is unique, Isadora was designed not to be a "plug and play" program, but instead offers building blocks that can be linked together in an almost unlimited number of ways. It is highly flexible, and well-suited to supporting independent creative research. Because of Isadora's fast video processing, flexible interface and easy learning curve, it has become an essential tool for artists and educators worldwide. Students will use it to help realize dance & theater performances, interactive art installations, video effects, and interactive educational environments.

LifeForms 4.0 software is a 3d physical character-animation software package. It is directly compatible with motion capture data and also enables original generation of character animation. Students will be able to use this software as an interface with other campus resources, such as the MOCAP Lab in GRAIL at CSE. It also interfaces directly with Maya, which is already extensively utilized in DXARTS/CARTAH 3d labs and elsewhere on campus.

DanceForms 1.0 is first-generation choreography software. It was developed from the legacy of LifeForms animation software, in collaboration with choreographers and dance teachers. It is intended for choreography, interdisciplinary arts and dance technology applications, and is currently in use at more than 50 universities worldwide. Students will be able to use this to collaborate and visualize theatrical and dance performance environments. By hosting this software, DXARTS will further encourage and support interdisciplinary collaborations.

SolidWorks is a solid modeler that outputs forms that are printable by the RP system. It is a precision engineering tool students will use to design angular objects that require a high degree of accuracy. For example, a student needing to make a mount that a sensor can fit into perfectly would use SolidWorks. Rhino, on the other hand, is a NURBS 3d Solid Modeler, and is excellent for generating more fluid curve-based shapes. Eagle CAD is an industry-level circuit design environment and is essential to the creation of circuit boards to be printed with our PCB Fabrication system.

Students will benefit from the ability to network electronic devices wirelessly and to send and mix video. The resources proposed in the Embedded System Performance Toolkit will increase student awareness of and experience in both highly customized installation scenarios and pro-level performance and exhibition environments. The Grass Valley Indigo HD Mixer will fill a much needed gap in the exhibition chain that currently supports student and department productions such as the DXARTS Meany Hall concerts and the Dancing in the Digital Domain collaboration between Dance and DXARTS graduate students. The Mac minis, with their accompanying WiPort technology, will provide solutions for students creating projects that require portable web servers and wireless networks.

Finally, students will benefit from the ways in which this proposal is synergistically aligned with past (and future) DXARTS resources. DXARTS is committed to cultivating artist-inventors, and has put considerable effort into building a comprehensive and well-integrated suite of software, hardware, and mindshare to enable students to innovate and create diverse projects from start to finish. This proposal builds on and extends the possibilities for UW students by opening up design, fabrication, and performance support in emerging media and providing integrative tools to facilitate interdisciplinary collaborations.

Student Access

The Performance & Embedded Systems Technology Toolkit allows access to students in three different ways.

First and foremost, any UW students who have pre-approved access, either through DXARTS or through a CARTAH project will be allowed access to the equipment and resources in this proposal. All students are eligible to apply for a CARTAH project and most student applications are approved. In addition, CARTAH provides the training for specific skills students need to properly use the equipment and software, and our fulltime staff and graduate students provide access to the facilities which house the proposed resources.

Second, in our courses, DXARTS provides training in basic foundational skills relevant various aspects of the Toolkit. Such students will be qualified to use components of the Toolkit. All DXARTS courses are open to non-majors, and the cross-disciplinary nature of the program means that students from almost every field will be involved in these classes.

Third, the Performance & Embedded Systems Technology Toolkit offers the student body and members of the greater community a way to experience innovative media content in the form of public performances and installations. Expanding on the success of the Meany Hall concerts organized by DXARTS each year and the Dancing in the Digital Domain collaboration with the Dance Department, we will use the Embedded System Performance Toolkit module to support the production of such events. These events will feature work created by UW students. In this way, the proposal comes full circle — it provides the tools for students to both create innovative artistic works, and then brings those works to a larger audience. This is a vital step in the development of a professional artist, and has the added benefit of expanding the cultural learning experience on campus. In fact, not only is student work shown at these events, but students play a vital role in planning, installing, and running the shows, offering yet another learning opportunity for students to build professional skills that will serve them in the future.

Available Resources

All past and future DXARTS resource purchases are synergistically aligned. This proposal is designed to compliment the existing resources available to students through DXARTS by adding new dimensions of integration and fabrication. With the addition of these elements, there are enormous possibilities for new connections between technologies and human

expression, with various components able to link together to work in concert.

The PCB system and the Fab@Home RP system will both be located at the DXARTS Fabrication Studio currently located in Fremont. At the Fremont Studio, DXARTS will provide workbenches, soldering and circuit assembly equipment, basic components (wire etc..) and both a wood and metal fabrication space. Additionally at the Fremont location there is a large scale CNC plasma cutter/router that non-PCB specific designs created at this workstation could be fabricated on. We have experienced engineers and designers in DXARTS that will build the Fab@Home rig and setup, calibrate, and maintain the PCB system. DXARTS has spent considerable internal funds renovating lab, storage, and workshop facilities that will house the equipment and provide space for students to work with these tools.

The dance and video-related software integrates with MOCAP data that can be captured at GRAIL in CSE. In addition, the software integrates with the Maya software setup currently in place in the DXARTS Open Lab, which has drop-in hours as well as after hours access policies. In this lab, DXARTS makes available key software needed to work with a wide range of digital media. SolidWorks and Rhino will also be installed in both the Open Lab and the Fremont Studio, in order to maximize their accessibility to the widest range of students and further integrate the various facilities. The computing power available in DXARTS facilities has been well invested in by STF committees past in partnership with funds from DXARTS, participation from Classroom Support Services, and ongoing in-kind donations from Apple Computer.

DXARTS also provides funding for lab monitors/supervisors in both the Open Studio Lab and the Fremont Fabrication Studio, insurance for all STF equipment, and funding for repairs, upgrades, and installation. DXARTS has three full time technical staff and two part time technical staff. Along with their regular duties they will be available to setup, maintain, and manage the proposed resources.

Installation Timeline

We expect to complete all purchases by the middle of Summer quarter, enabling student use of the majority of equipment by the beginning of Autumn 2007. We will have graduate student assistants and designated technical staff assigned to these tasks and will expedite their completion.

Departmental Endorsement

This proposal is supported by Shawn Brixey, the Director of both DXARTS and CARTAH, fully endorses and this proposal and is willing to help support the implementation and expansion of this Toolkit with the DXARTS resources here described in the event the proposal is funded by the STF committee.

Student Endorsement

As a 3rd year grad student at DXARTS, an author of this and prior successful DXARTS STF proposals, and an artist interested in dance-cinema and video installations, I wholeheartedly support this proposal. I believe that the DXARTS department is uniquely poised to pioneer the invention of new art systems on campus, and has the ability to wholly support the kind of integrated performative technology proposed here. I foresee myself and many other students from across campus using every combination of software and research tools in this proposal to create a vast array of interactive performance systems. Personally I am excited about using the Isadora software in combination with interactive camera systems, which are supported by custom fabrication of flexible circuit boards in my future video research. I am glad that DXARTS in partnership with the STF has had the extraordinary vision to make the resources, space, and training available for me and others available to achieve our bold ideas, and I am personally committed to helping continue this tradition and to continue to make it possible for students to do original research on campus.

Thank you for considering this proposal.

Sincerely,
Noel Paul
PhD Candidate and Lead TA,
Center for Digital Arts and Experimental Media
DXARTS

As a PhD student in my 3rd year at DXARTS and a visual artist interested in 3d, fabrication and sensed data, I am very excited by the potentials of this proposal. These technologies will open up creative mediums to many students interested in digital arts fabrication, data driven performance, real-time video mixing, and embedded wearable computing; while also bringing interest and enforcing bonds with other departments like Dance, Mechanical Engineering, and Computer Science. I could imagine using the Flex PCB printer to generate circuitry that I can wrap and embed into the art installations I work on, and with the wireless technologies I could present and document the work without chords running up and down the structure and taking away from the efforts put into its design. I am honored to have worked on such a worthwhile and forward thinking package, and am greatly inspired by all of the possibilities it would bring to the creative pursuits of artists-innovators here at UW. I fully support this proposal.

Many Thanks,
Allison Kudla

PhD Student,
Center for Digital Arts and Experimental Media
DXARTS

Items

Below are the items making up the current proposal. The asterisk (*) beside items signify that they were approved by the committee. This however was not implemented correctly for our database before 2005, so earlier years may not show this.

Click an item's title to view details on that item, or *show all item details*.

Title	Type	Price	Qty	Subtotal
* Isadora software	Software	$2,082.00	1	$2,082.00

Location: Raitt Hall - 129

Description: Graphic programming environment that provides interactive control over digital media, with special emphasis on the real-time manipulation of digital video. (license for 10 users, academic discount). Prices include tax and shipping.

Justification: Offers building blocks that can be linked together in an almost unlimited number of ways to realize dance & theater performances, art installations, video effects both offline and realtime, and interactive learning environments.

* LifeForms Studio	Software	$1,622.00	1	$1,622.00

Location: Raitt Hall - 129

Description: 3D physical character-animation software package. (license for 10 users, academic discount). Prices include tax and shipping.

Justification: Directly compatible with motion-capture data, as well as with Maya software which is currently running at DXARTS and elsewhere on campus.

* DanceForms 1.0	Software	$540.00	1	$540.00

Location: Raitt Hall - 129

Description: First-generation choreography software. (license for 10 users, academic discount). Prices include taxes and shipping.

Justification: Enables visualization of dance 3D environment. It is intended for choreography, interdisciplinary arts and dance technology applications, and is currently in use at more than 50 universities worldwide.

* Eagle CAD PCB Design Software	Software	$1,295.00	1	$1,295.00

Location: Off-Campus -

Description: PCB design software. Prices include tax and shipping.

Justification: This software is necessary for the design of PCB and flex circuits.

* SolidWorks Education Network 2006 Lab Pa	Software	$719.00	1	$719.00

Location: Raitt Hall - 129

Description: SolidWorks is an polygonal based CAD software. Used to create solid models for the use of designing precise geometry that can be printed on 3D printers. (license for 10 users, academic discount). Prices include tax and shipping.

Justification: Having a 3D CAD software specifically for engineering is essential to the development of plastic prototypes, fasteners, housings etc. for performative and installation based work.

* Rhino Educational Lab Kit	Software	$1,055.00	1	$1,055.00

Location: Raitt Hall - 129

Description: Rhino is a nurbs based 3D solid modeller used to generate forms to be printed on the 3D printer. (license for 30 seats academic discount). Prices include tax and shipping.

Justification: Rhino allows for control of nurbs or curves based forms and can be used as a formal design tool that would complement a more engineering based modelling application like SolidWorks.

* LPKF ProtoMat S100 w/Dust Extractor	Hardware	$28,760.00	1	$28,760.00

Location: Off-Campus -

Description: Housed in DXARTS Fremont Fabrication Studio. 100k RPM PCB router. Capable of making RF(radio frequency) and flex material prototype circuit boards. Prices include tax and shipping.

Justification: With this machine students will be able to make flexible RFID sensor pads as well as other flexible circuit designs in wearable performace technologies.

* Milling Tools & Flex Milling Tools	Hardware	$865.00	1	$865.00

Location: Raitt Hall -

Description: Kit of drill and milling bits for both general and flex applications. Prices include tax and shipping.

Justification: Supports general PCB routing as well as RF & flex circuit designs & materials.

* Vacuum Table	Hardware	$2,055.00	1	$2,055.00

Location: Off-Campus -

Description: Attaches to the S100 to hold down flex materials and other circuit boards durring the milling process. Prices include tax and shipping.

Justification: This is a critical tool for working with flex material.

* ProMask System	Hardware	$2,936.00	1	$2,936.00

Location: Off-Campus -

Description: Kit and tools for creating solder masks and circuit legends on PCB's created with the S100. Prices include tax and shipping.

Justification: This will allow for more robust circuit designs and facilitate the assembly of surface mount technologies.

* Fluke 196B Scopemeter	Hardware	$2,950.00	1	$2,950.00

Location: Off-Campus -

Description: This is a portable scopemeter. Prices include tax and shipping.

Justification: To be used in the design and testing of RF circuits, also to be used for all other circuit design, and easily portable for use at performace locations, video shoots, or other field work requireing electronic diagnostics.

* Dell XP Workstation	windows-pc	$1,459.00	1	$1,459.00

Location: Off-Campus -

Description: Dell XP Circuit Design & Router Control Workstation. One desktop PC mini tower to be used for PCB design. Prices include tax and shipping.

Justification: This workstation will be able to design PCB circuits and run the S100 prototypeing system.

* Fab@Home DIY Rapid Prototyping Kit	Hardware	$3,385.00	1	$3,385.00

Location: Off-Campus -

Description: Fab@home is an open source initiative began by Cornell University which publicly shares the instructions and materials required to build a portable, light-weight, reasonably small and modifiable 3d printer for costs staggeringly lower than any market price for similar technologies. Prices include tax and shipping.

Justification: This technology would make it easier and simpler for students in the University interested in digital arts to generate 3D forms and parts without some of the technical overhead that high-end tools of similar output create in other departments in UW, while also giving the students exposure to tools that they may desire to learn in more technical depth at a future point in their careers at UW. It integrates with our existing suite of CNC tools and also our PCB Design tools for wearable and performative computing.

* Apple Mac Mini	macintosh	$1,003.00	2	$2,006.00

Location: Off-Campus -

Description: Apple Mac Mini, 1.83Ghz Intel, 512MB, 80GB, w/wireless Keyboard & Mouse. Portable & powerful computers that can host embedded wireless networks. Prices include tax and shipping.

Justification: An essential component to realtime computing for performance, theatre and installation art; these portable mac minis save space and resources and are far more feasible than using bulky and excessive desktop cpus.

* BluePort XP Bluetooth Transmittor	Hardware	$238.00	2	$476.00

Location: Off-Campus -

Description: BluePort XP Bluetooth Transmittor device w/Rechargeable Battery (incl. power supply). Prices include tax and shipping.

Justification: This Bluetooth technology will allow for data to be transmitted invisibly, freeing up motion in data driven live performance.

* Addlogix EchoView Wireless Video Adapter	Hardware	$238.00	2	$476.00

Location: Off-Campus -

Description: Enables computer video to be sent wirelessly to projectors or other digital displays. Prices include tax and shipping.

Justification: Will be used for installations and performance/exhibition environments where cabling is not possible.

* WiPort Serial to 802.11b/g Web-Server De	Software	$325.00	1	$325.00

Location: Off-Campus -

Description: Software SDK for the WiPort embedded Web Server. Prices include tax and shipping.

Justification: The WiPort SDK will allow users of the WiPort Hardware the ability to customize its application and set up their own remote servers for the transmission and receival of interactive and sensed data.

* WiPort Serial to 802.11b/g Embedded Web-	Hardware	$130.00	2	$260.00

Location: Off-Campus -

Description: Enables virtutally any electronic device to be wirelessly networked. Prices include tax and shipping.

Justification: The WiPort tool allows for a wireless connection to the internet or any remotely stored database of information. It integrates into intelligent kinetic installation art, site specific embedded artworks, digital performance technologies, and so on.

* Grass Valley Indigo HD Mixer	audio/video-editing	$15,678.00	1	$15,678.00

Location: Raitt Hall - 132A

Description: High-end HD Video Mixer for Performance, Exhibition, and Installations. Prices include tax and shipping.

Justification: Will be used primarily to support departental events and student productions.

* 50' DVI Extender	audio/video-hardware	$519.00	1	$519.00

Location: Raitt Hall - 132A

Description: Extends the possible cable length between the Video Mixer and Projector. Prices include tax and shipping.

Justification: Necessary for use of Video Mixer in large venues such as Meany Hall.

* Road Cases for Indigo HD Mixer & Mac Min	other	$541.00	1	$541.00

Location: Raitt Hall - 132A

Description: Road Cases for Video Mixer and Mac Minis. Prices include tax and shipping.

Justification: Allows these items to be portable.

Requested Total:	$70,004.00
Approved Total:	$70,004.00
Funding Status:	Fully Funded

Comments

🗨 Add Comment

I am a new media/performance artist and first year PhD student at DXARTS. I intend to explore new territory in the convergence zones between dance, digital media, and live performance during my time at UW. The DXARTS Performance and Embedded Toolkit is an important step forward in building the infrastructure to support advanced inquiry in new media performance at UW. My PhD work at DXARTS will definitely make use of the Integrated Design Package (IDP) and Embedded System Performance Toolkit (ESPT) for interactive dance performance works, telematic performance, virtual choreography, motion-captured data processing, and other applications I look forward to discovering with these powerful technologies. I fully endorse this proposal.

Heather Raikes
DXARTS PhD Student
hraikes@u.washington.edu

As a 2nd PhD student at DXARTS, I found myself dedicated to mechatronics art. The DXARTS Performance and Embedded Toolkit enhances the possibility and flexibility of my artworks including locative media, robotics installations and interactive dance performances. Last year, my artwork, as well as my independent study with Prof. Shawn Brixey have been exhibited in ZeroOne San Jose: ISEA 2006 (http://isea2006.sjsu.edu/). It is a milestone festival to be held biennially that makes accessible the work of the most innovative contemporary artists in the world. I will definitely continue the exploration of the technology and fully utilize the Integrated Design Package (IDP), Embedded System Performance Toolkit (ESPT) and Flex Fabrication System (FFS) for my artworks. I fully endorse this proposal and looking forward to developing and exploring more possibilities with the advanced technologies.

I am doctoral student at DXARTS working with 3D audio, electronics and video installation. Coming from an engineering and human factors background, I believe that the tools and systems used to produce art and media are both the limiting factors and the conceptual leverage that allow the development of work that changes the paradigms through which we perceive and understand our lives and the world around us. Being able to design and build the tools and systems I use in is a critical factor in my work. DXARTS in general, and this proposal in particular, promote the professional development and personal expression of students to allow them to express their visions in the broadest sense rather than settling for what is possible given a limited toolset.

I will use the Rhino and Solidworks software and the Fab@Home and PCB fabrication tools in conjunction with existing hardware in the Fremont studio to build installations that sense, learn, and change their environment by using neural networks. Being able to construct complex forms using additive fab processes and prototype circuitry rapidly and inexpensively would allow me more iterations to develop my ideas on a deeper level than I can by using resources off-campus. I therefore strongly support this proposal, and I am grateful that the STF exists to provide opportunities such as this for myself, my peers, and our undergraduate students.

-
Joel S Kollin
PhD Student, DXARTS,
Center for Digital Arts and Experimental Media

I am quickly learning how critical it is to have access to customizable tools and software, particularly in the sensing and control spectrum of technology. There are many ideas that I have envisioned, yet I become somewhat disillusioned as to bringing these ideas to fruition due to an overwhelming lack of experience with the desired tools and software listed within the STF proposal. I find myself making rickety contraptions that would not hold up to any standards or intersections of art and science. It is clear that only after using software and tools endorsed within this proposal, that I will get closer to understanding what I am capable of creating.

Gary Pennock, Senior, DXARTS

As the Director of the Dance Program, I wish to lend my enthusiastic support to this STF proposal. DXARTS and Dance have been involved in curricularly-based and performance collarations for over a year. Our collaborations speak to the exciting emergent arena of dance & technology, and specifically to digitally mediated creative and performance practices. Last year's 3-D: Dancing in the Digital Domain concert led to the creation and production of new choreography that seamlessly incorporated new digital media such as the use of RFID technolgy. The Performance & Embedded Systems Technology Toolkit will have a profound impact on how students conceive of and create new movement-based performance. LifeForms & Dance Forms allow students to create digitally inspired movement composition. This has profound ramifactions because it increases access to the compositional process to include non-dancers and dancers with disabilities.

DXARTS commitment to providing access to the UW community is to be highly commended. Their interest in new collaboratively generated work is sincere and points to how art will be conceived of and produced in the future. I sincerely hope that you award this STF grant to DXARTS.

Sincerely,
Elizabeth "Betsy" Cooper, Director, UW Dance Program

This package is really very intriguing in its ability to allow a much greater freedom for innovation in a department centered around this kind of research. I look forward to learning these new tools and realizing what I currently cannot realize without them. The merging of elements such as dance and media is really very exciting. Performance is a whole new layer to be added into the experimental and digital artwork frontier. I support this proposal. Thanks.

As a first year PhD student at DXARTS and a new-media artist interested in dance performance and digital technologies I fully support this proposal. The technologies, software and devices will be extraordinarily helpful. The interest of the proposal for me is that each technology will help to solve particular challenges, while at the same time that the entire kit will allow me to design, develop, and realize complex art works. What it is also valuable is that all these technologies are available not only to the DXARTS's students but to the entire community at the University of Washington. In my case, Isadora, LifeForms, and DanceForms will help me to design and create dance works in a way that could be extremely hard to do in any other way. It is very inspiring to know that we could have these technologies for the artistic production at the University of Washington.
Hugo Solis
PhD Student
Center for Digital Arts and Experimental Media

These are tools that could not be better utilized by any other collegiate department. This package is what DXArts needs. It will expand the possibilities and boundaries of our research and help us explore limitlessly.

This proposal is very exciting for me as the tools proposed may prove essential for creating my own senior thesis. I am very interested in combining interactive and extra-perceptory elements with live dance and theater. This is in many ways a ground-breaking corner of the Arts world. There is a lot to explore here and ever widening potential as technologies emerge daily. DXARTS is in a unique position to explore these potential avenues granting that we are equipped properly to do so.

This proposal is - to put it bluntly - awesome. The equipment requested in this proposal will go a long way towards augmenting the university's technical infrastructure with key tools

to allow for critical technical experimentation. It is exactly these types of resources that will enable this institution to expand its high-tech leadership in engineering, science, and the arts. DXARTS is known for its multidisciplinary approach, and this proposal will provide much-needed technical capabilities to individuals from many disparate academic departments.

I support this proposal. These fundings are much needed to the academic community such as DXARTS and CARTAH to research, reapproach and renew studies using updated technology. This will help many scholars and students to achieve their goals. Thank you.

What now the so called "No Restrictions" access now includes "Off Campus" Locations for equipment! Right, I will bet that not one student other than dXarts program individuals will ever even see the requested tools let alone ever be allowed an opportunity to use them. This goes against the principles of the STF. Open access and not to be used to create programs or program specific. Their requests are the most program specific I have ever seen, dXarts entire existance is because of the STF. The STF is their funding source, they have not received one competively funded grant except for STF monies. Wow huge acomplishment dXarts!! What a fraud!

As Technical Director of the Dance Program, I vigorously support this proposal. The Isadora software, the Mac Minis, and the Grass Valley video mixer are software and hardware tools that will extend the creative utility of cameras and projectors requested and funded in other proposals. Sincerely, Michael Wellborn

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