

The Extended Now: Resource list for installation and performance.

Software:

Two excellent tools for easily integrating live & recorded media, and many types of sensor data are **Isadora** (created by Mark Coniglio), and **Max-MSP**.

Typically most projects involving physical computing will also need code written for the microcontroller and its interface with a computer. Processing, Open Frameworks and the Arduino IDE are three of the main tools in this regard.

Patching environments:

Isadora

Current version is 2.2 available at <http://troikatronix.com/download/isadora-download/>

And the manual is here: <http://troikatronix.com/files/isadora-manual.pdf>

Tutorials are at <http://www.youtube.com/user/troikatronix>

[Forum at troikatronix.com/community/](http://troikatronix.com/community/)

There are academic licenses available, and, the demo version is fully functional – except you can't save. Your workshop license will typically continue to work until the end of the month.

Max-MSP

<http://cycling74.com/downloads/>

The classic audio patching environment. There are also academic licenses available. The demo version is fully functional for 30 days. The latest release (max 7.0) also has a subscription feature.

Vvvv

<http://vvvv.org/>

VVVV is a PC only node based programming tool that is particularly useful for working with 3-d graphics and also has tools for integrating with more complex SQL and ODBC databases and XML files as data sources for live visualizations both on / off the network. A steeper learning curve than isadora. Free for non-commercial use, 500 euros for a license.

Resolume

<http://resolume.com/>

An FFGL based projection mapping and VJ tool. An interface similar to Abelton Live but for video.. Particularly targeted toward VJs. Pretty easy to learn.

TouchDesigner

<https://www.derivative.ca/>

PC only visual design and patching environment. Excellent set of tools for large scale installations and projection mapping but quite pricey (\$2200).

Code based:

Processing

Open source creative coding environment based on Java. Current

<https://processing.org/download/>

The Extended Now: Resource list for installation and performance.

Open Frameworks

A c++ based set of open source frameworks for creative coding

<http://openframeworks.cc/about/>

Arduino IDE

The development environment for Arduino and similar microcontrollers. Current working version 1.6.8. Avoid version 1.6.4.

<http://arduino.cc/en/Main/Software>

TeensyDuino

The arduino environment add-on for working with the Teensy microcontrollers. Currently works with arduino 1.6.8. Current version 1.28.

http://www.pjrc.com/teensy/td_download.html

Plugins, drivers, and utilities:

Matrox triple head drivers (to use the double head or triple head on your own machine):

<http://www.matrox.com/graphics/en/support/drivers/download/?id=504>

Osculator (for OSC / midi translation)

<http://www.osculator.net/download/>

Touch OSC (for iPhone and pad) – provides easy templates / control interfaces for iPhone and iPad that send OSC to Isadora

<http://hexler.net/software/touchosc>

GyrOSC (for iPhone and iPad) – motion sensor to OSC app (app store)

Syphon <http://syphon.v002.info/> - software that allows sharing of video streams between applications on OSX. Isadora includes syphon out of the box (syphon to video and syphon to texture actor).

Videoglide: <http://www.echofx.com/videoglide.html> to allow use of cheap PC USB capture devices on the Mac (such as the Pinnacle Dazzle DVC 100) to easily connect and digitize older SD analog video sources like pinhole cameras, DVD's, and DV cameras. NO AUDIO ON 10.9 or 10.10.

NIMate – easy software interface to the Kinect – allows access to both Kinect cameras (depth map and RGB) and converts skeleton data to OSC. V2.0 released in August 2015. <http://www.ni-mate.com/download/>

Epoccam hd - from Kinomi (allows iPhone and Android phones to be used as wireless cameras inputting to syphon / Isadora) multicam software is 19.99 on app store. - <http://www.kinomi.com/>

Ipcam2syphon – open source program to all input of photojpg compressed IPCAM feeds directly to syphon (and thus Isadora) <https://github.com/bakercp/IPCAM2SYPHON/downloads>

Soundflower – utility from cycling74 that allows routing of audio between applications. Problematic

The Extended Now: Resource list for installation and performance.

on Mavericks. <http://cycling74.com/downloads/>

HAP codec from Vidvox: new highly efficient codec for HD video supported natively in the new version of isadora. For both PC and Mac. <https://github.com/Vidvox/hap-qt-codec/releases/tag/version-4>

Video compression: Use HAP, photojg or apple pro-res codecs on Mac. With v2.0 of isadora you can use H264 files on the “performance mode”. The new HAP codec is now supported in Isadora for both PC and Mac. On a PC use native AVI or WMV wrapper with photojpeg or HAP.

Tools for compression include:

- QuickTime 7 Pro
- Apple Compressor (49.99 or free w/ FCP) :
- Adobe Media Encoder (free with adobe apps_
- Mpeg streamclip (free) : <http://www.squared5.com/>

Video Hardware:

Blackmagic Intensity Extreme thunderbolt or pcie version:
<http://www.blackmagicdesign.com/products/intensity>
For high quality live capture of HDMI and any analog signal.

Matrox triple head: splits an outgoing monitor signal to three separate monitors. Allows a regular laptop to support three projectors simultaneously. Most recent mac laptops will want the “display port” edition. Be sure to choose the correct one for the machine you are planning on using it with. There are 4 non-interchangeable versions.
<http://www.matrox.com/graphics/en/products/gxm/th2go/displayport/>

OLD OPTION : Pinnacle Dazzle 100 (or similar): cheap standard definition (720x480) video capture via USB 2.0. On Mac requires use of [videoglide driver](#) see echofx above. No audio support of osx 10.9 / 10.10

Lighting Control

Isadora works well with many types of DMX controlled fixtures. A USB > DMX interface or Artnet interface is necessary.

Lanbox

<http://www.lanbox.com/>

Lanbox is a German manufacturer of the eponymous lanbox which has specialized actor support for isadora and includes physical interfaces for almost any type of electronic object you’ll encounter – DMX, MIDI, Artnet, ethernet / TCP-IP, RS-232, along with built in dimmers. A little pricey in the states but a great tool.

DMXking

<http://dmxking.com/>

The Extended Now: Resource list for installation and performance.

DMX king is a new zealand based competitor to ENTTEC. Great solid products. Often about 20% cheaper. They make a number of great Artnet > LED interfaces as well as the standard USB>DMX single universe box.

ENTTEC

<https://www.enttec.com/>

Enttec supplies the lighting industry standard DMX and artnet interfaces. The DMX Usb Pro or DMX Usb pro Mark II both work well with Isadora so long as you are using the FTDI driver set and the DMX user actor set.

QLC Pro

<http://www.qlcplus.org/>

Free software based lighting desk created by Massimo Callegari with OSC support – integrates easily with isadora via OSC to control complex multi-channel fixtures like moving lights and LED arrays.

Physical computing and sensor resources

Adafruit: sensors, microcontrollers, tutorials, and parts – targeted to the DIY world

<http://www.adafruit.com/>

Sparkfun: sensors, microcontrollers, tutorials, parts – targeted to the DIY world

<https://www.sparkfun.com/>

PJRC: maker of the Teensy controller – a 32 bit arduino compatible microcontroller, with built in touch capacitance sensor, and 16 bit audio.

<http://pjrc.com/store/teensy31.html>

libelium / cooking hacks two closely related firms that are the makers of the Xbee module, the e-health platform and similar products. <http://www.libelium.com/> and <http://www.cooking-hacks.com/>

Mouser Electronics – sells 1 to 1,000,000 of virtually any electronic component ever. Targeted to OEM engineers.

<http://uk.mouser.com/>

Jameco – bay area based wholesaler of power supplies and electromechanical parts

<http://www.jameco.com/>

Farnell- UK based wholesaler

<http://uk.farnell.com/>

pluginwear – Italian based distributor of wearable textile materials

<http://www.pluginwear.com/default.asp?mod=home>

markertek – conductive textiles in quantity and many other professional AV products

<http://www.marktek-inc.com/eeontexconductextiles.htm>

imagesco : stretch sensors

<http://www.imagesco.com/sensors/stretch-sensor.html>

The Extended Now: Resource list for installation and performance.

Parts express – us based audio parts wholesaler

<http://www.parts-express.com/>

Tindie – open source hardware market

First surface mirrors

<http://www.mirotek.com/index.html>

Some specific products

* conductive thread - <http://www.maplin.co.uk/p/silverthread-conductive-thread-10m-n36dd> and <http://www.adafruit.com/products/640>

* resistive thread

* conductive rubber - <http://www.adafruit.com/products/519> 350 ohms / inch > stretches by ~ 70%

* velostat- pressure sensitive carbon film that changes resistance in relation to pressure. combine with woven conductive fabric (1ohm/ft) - use in conjunction w/ velostat for a effect pressure sensor

* knit conductive fabric - stretchy jersey type fabric - can work as a "variable" resistor to sense stretch.

Reading:

technical references and guides

Web sources

kobekant (Hannah perner wilson's resource on e-textile based computing)

<http://www.kobakant.at/DIY/>

Adafruit tutorials : <https://learn.adafruit.com/>

CNMAT (center for new music and audio technology) – has a useful materials resource page describing materials in house <http://cnmat.berkeley.edu/resources>

Reading Capacitor Codes

http://www.ece.ucsb.edu/courses/ECE002/2A_F08Shynk/ReadingCapacitorCodes.pdf

Reading resistors

<http://www.instructables.com/id/How-to-read-color-codes-from-resistors-1/>

voltage divider circuit analysis (many options – all about cit

http://www.allaboutcircuits.com/vol_1/chpt_6/1.html

Books on coding and work with physical sensors.

Learning processing (just updated to v2)

Daniel Shiffman

The Nature of Code: simulating natural systems with processing

Daniel Shiffman

Processing: a programming handbook for visual designers and artists

Casey Reas and Ben Fry

Programming Interactivity

Joshua Noble

The Extended Now: Resource list for installation and performance.

Making things talk: physical computing with sensors, networks and arduino

Tom Igoe

Theoretical reading

Aesthetics of Interaction in Digital Art

Katja Kwastek

A History of Experimental Film and Video, 2nd Ed.

L. Rees

Bodies in Code: interfaces with digital media

Mark B Hansen

Closer

Susan Kozel

Digital Performance

Steve Dixon

Lunenfeld, Peter (ed.). The Digital Dialectic: New Essays on New Media. 1999. Leonardo / MIT Press. Cambridge, MA.

Entangled: Technology and the Transformation of Performance

Chris Salter

Exhausting Dance: performance and the politics of movement

Andre Lepecki

Installation art: a critical history

Claire Bishop

Intermediality in Theatre and Performance

Freda Chapple and Chiel Kattenbelt, eds. 2006.

Good overview of the idea of intermediality

Moving without a body: Digital Philosophy and Choreographic Thoughts

Stamatia Portanova

New Screen Media: cinema-art – narrative

Martin Reiser and Andrea Zapp

Noise: The Political Economy of Music

Jacques Attali

Performance and Technology

Susan Broadhurst and Josephine Machoon

Sensorium: embodied experience, technology and contemporary art

Caroline Jones

Sounding New Media: immersion and embodiment in arts and culture

Frances Dyson

The Extended Now: Resource list for installation and performance.

Staging the Screen: the use of film and video in Theater

Greg Gieskam

Touch: sensuous theory and multisensory media

Laura U Marks

The Way of Acting: The Theater Writing of Tadashi Suzuki

Tadashi Suzuki

Walking and Mapping: Artists as Cartographers

Karen O'Rourke. MIT Press

Notes on additional books to look at:

Composing Interactive Music: Techniques and Ideas using Max

Todd Winkler. 1998. MIT press

Good older Max guide to creating interactive music structures.

Devising performance, a critical history

Deirdre Haddon and Jane Milling. 2006. Palgrave.

The Wooster Group Workbook

Andrew Quick

Sonic Warfare: Sound, affect and the ecology of fear

Steve Goodman. 2010. MIT

Landscape and Power

WJT Mitchell, ed. 1994