creative technology – slogan(s)

focus – to improve/embellish public space with innovative (media/sensor) technology

- science/art-inspired visual effects
- out-of-screen deployment
- environment-sensitive application(s)

metaphor(s) – towards a new curriculum

- a networked world – you make it work [engineering, management] – not network maintenance!
- everything is connected – you make the connections [mediator, management]
- *everything is intertwinkled* (Ted Nelson) – you make it twinkle [the creative track]

student(s) – every student is trained as an artist

- (visual & concept) design
- (technology & application) development
- (aesthetic & intellectual) sensibility

profile(s) – in very scientist is a (hidden) artist

- more in-depth (research-related) technology development
- (proper) intellectual and academic context for innovation

scope(s) – learning goal(s)/approach

- (low-level) basics/technology – to take away the magic
- (high-level) applications/tools – to achieve challenging target(s)

identiy – creative track

- identity – as a group
- portfolio – as individual
- imagination – mixing science and art
- authenticity – as in no bullshit
- craftmanship – in discovering the rethorics of the material

slogan(s) – do you want to make a difference

- technology to innovate social processes
- social processes to innovate technology

control(s) – layered mentorship

- supervision(s) – from multiple perspectives
- (peer) reviews – with mild competitive edge
- (public) exhibition(s) – for external exposure
- (scientific) competition(s) – by demo(s) & paper(s)

course(s) – principle(s)

- canonical example(s) – *game* / *calculator*
- (online) reference material(s) – www.w3schools.com/js / example(s)
- challenging target(s) – heart(s) / labs.google.com (*edu* / *code*)

element(s) – educational mechanism(s)

- (art) inspiration(s) – item(s) of beauty
- (periodic) de-construction(s) – discover (un)truth(s)
- (technical) exploration(s) – trial(s) without error(s)
- (creative) workshop(s) – to boost the imagination(s)
- (special) event(s) – to educate and surprise

learn – to acquire/deepen skills & insight

- craft – drill & repetition
- concept(s) – application(s) & reflection
- target(s) – challenge(s) & context

platform(s) – dynamic (virtual) culture(s)

- software – *architecture vs ecology*
- *technology* – hybrid, interconnected, customizable function(s)/skin(s)
- application(s) – *in a participatory* (playful) *culture*
- (serious) game(s) & entertainment – *programmed content* / script(s)
- *exploratory development* – to discover the potential(s) of technology

discipline(s) – multi/cross-disciplinary team(s)

- new media – design & development
- sensor technolgy – engineering & deployment
- creative application(s) – innovation

interact(s) – interactive entertainment – *facets of fun*

- immersion – *being in*
- *rapture* – loss of *aesthetic* distance
- agency – being in *control*

art(s) – computer augmented artefact(s)

- emotional response – *enrich experience*
- intellectual challenge – simply *avoid boredom*

computer augmented artefact(s)

concept(s) – creative technology

- target(s) – digital, computational & conceptual skills
- topic(s) – invisible computing & digital culture
- course(s) – sensor technology & new (digital) media

target(s) – creative technology & industrial design

- concept(s) – instrumentation, *interaction*, visualisation
- context(s) – home, office & urban environment(s)
- approach(s) – (*computational*) simulation(s) & exploration(s)

resource(s)

This section contains a variety of itmes, including a selection of online tutorials and thesauri. Some examples are given of online museum tours and listings are included of the media art and cultural heritage institutes mentioned in the book. But we will start with introducing briefly with what you need for 3D authoring and rendering, since this is what we have primarily focused on in theis book.

3D authoring & conversion

- vrmlpad – www.parallelgraphics.com/products/vrmlpad
- polytrans – www.okino.com/products.htm
- maya – www.alias.com
- 3dsmax – www.discreet.com
- sketchup – sketchup.google.com/download.html
- flux studio – www.mediamachines.com/products.html

The *polytrans* tool from Okino has been included, since it allows you to convert almost any format into you format of choice, which is a great asset for (re) using models.

3D rendering

- blaxxun – www.blaxxun.com/en/products/contact
- virtools – www.virtools.com
- flux web3d – sourceforge.net/projects/flux
- mediamachines flux – www.mediamachines.com/products.html

As concerns price, VRML-based solutions for authoring and rendering are clearly low-cost, whereas tools such as *Maya* and *Studio Max* require more investment, not only in money but also in learning time. Also *Virtools* is in the higher price range.

tutorials

- html – www.mcli.dist.maricopa.edu/tut
- javascript – www.javascriptkit.com
- php – www.php.net/docs.php
- rdf – www.w3.org/TR/rdf-primer
- vrml – web3d.vapourtech.com/tutorials/vrml97
- java – java.sun.com/docs/books/tutorial
- 3D modeling – www.raph.com/3dartists/tutorials/t-3dsmax.html
- games in VRML – www.3dezine.com/3DEZine/gamestory.html
- ria – www.macromedia.com/resources/business/rich_internet_apps/whitepapers.html

In many cases it is (more) convenient to have working examples at hand. Personally, I advice my students to learn using HTML, VRML, Javascript and the like from one of the online tutorials, which do provide such examples. The *php* documentation is not really a tutorial but does provide useful help and examples.

visual design

- collage – www.artlex.com/ArtLex/c/collage.html
- storyboard – www.thestoryboardartist.com/links.html
- drawing – www.thestoryboardartist.com/tutorial.html

For *visual design* it might be worthwhile to look at some examples, or even take a complete course in drawing.

museum

- van gogh – www.vangoghmuseum.nl
- rijksmuseum – www.rijksmuseum.nl

- canada – www.virtualmuseum.ca/English/index_flashFT.html
- zkm – www.zkm.de
- tate – www.tate.org.uk
- louvre – www.louvre.fr

More inspiration can perhaps be obtained from looking at what musea have to offer. It also gives you an opportunity to update your knowledge of the history of art.

media art

- montevideo – www.montevideo.nl
- V2 – www.v2.nl
- electronic arts intermix – www.eai.org/eai
- cinemanet – www.cinemaneteurope.com
- variable media – www.variablemedia.net
- net art – wwwwwwwww.jodi.org/100cc/index.html
- mediamatic – www.mediamatic.net

Listed above are institutions that play a role in the preservation and dissemination of contemporary media art. Not an institution, but an early pioneer of art on the internet, is *jodi* from *net art*.

virtual tours

- amsterdam – www.channels.nl
- panoramic amsterdam – www.panoramsterdam.nl
- rijksmuseum – www.rijksmuseum.nl/collectie/meesterwerken/?lang=en
- groningen – www.kalamiteit.nl/world/no_cache/museum/vrml/connect.html
- mondriaan – www.artmuseums.harvard.edu/mondrian

Many cities nowadays have virtual tours. And also many musea allow the (online) visitor to have a look at their collection.

cultural heritage

- incca – www.incca.org
- delos – www.delos.info
- echo – echo.mpiwg-berlin.mpg.de/home
- eu – www.iue.it/ECArchives
- cidoc – www.cidoc.icom.org
- collate – www.collate.de
- cimwos – www.xanthi.ilsp.gr/cimwos
- library of congress – www.loc.gov./
- scriptorium – sunsite.berkeley.edu/scriptorium
- tei – www.tei-c.org
- open archives – www.tei-c.org
- topia – topia.telin.nl

Above is a mixed collection of references to organizations and institutions that are in some way involved in cultural heritage projects, either related to traditional art or contemporary art.

thesaurus

- webopedia – www.webopedia.com
- visual – www.visualthesaurus.com
- 3D glossary – www.nvidia.com/page/pg_20010527107687.html
- art & architecture – www.getty.edu/research/conducting_research/vocabularies/aat/

- modern art – en.wikipedia.org/wiki/Modern_art
- (new) media art – en.wikipedia.org/wiki/New_Media_art
- art online – www.art-online.com
- multimedia – www.insead.fr/CALT/Encyclopedia/Media/multimedia.html
- virtual reality – www.insead.fr/CALT/Encyclopedia/ComputerSciences/VR
- gaming – www.insead.fr/CALT/Encyclopedia/ComputerSciences/Gaming
- mathematics – www.cs.brown.edu/people/scd/facts.html
- mpeg – www.m4if.org/mpeg4
- wikipedia – en.wikipedia.org/wiki/Multimedia

There is a wealth of online information sources, including glossaries and thesauri. Beware, not all of them are properly authorized. Nevertheless, it might be interesting to note that the online version of this book is referred to in the *wikipedia*, for the entry *multimedia*.

games

- gamasutra – www.gamesutra.com
- gamedev – www.gamedev.net
- developer – www.gdmag.com/resources.html
- and more – www.lostlogic.com/postnuke
- games at school – www.freewebs.com/schoolgamemaker
- gamemaker – www.gamemaker.nl/
- game learning – www.gamelearning.net
- scripting – htpp://www.lua.org
- open source – www.delta3d.org
- free source – www.thefreecountry.com/sourcecode/games.shtml

For games, there are several popular sites providing information about new upcoming games, as well as developer's resources, including software available for download.

A recommended open source game engine is *Delta3D*. This package contains a variety of open source software, well-integrated due to the efforts of a dedicated team at the Naval Postgraduate School in Monterey, CA/USA.

serious games

- play2learn – www.play2learn.nl
- nitrogenius – www.serc.nl/play2learn/products/nitrogenius
- at school – rla.oakland.edu/∼ist_699
- primary games – www.primarygames.com
- games at school – www.freewebs.com/schoolgamemaker
- arcade – www.educationarcade.org
- never winter – nwn.bioware.com

Serious games are a new brand of games. Not really new in terms of technology, but new with respect to focus and intent.