computational aesthetics

or: what the heck is “digital media”?
painting

brushes: tools

solution in which paint pigments are bound: medium

paints, canvas, paper: also medium (materials)

painting as a kind of practice: also a medium (field)

finished painting: a work
computer: tool or medium?
work (form of reception)
first approximation of a definition of computer art: works created using computer hardware and software, with varying forms of output.
TOOLS: computer hardware & software

MEDIUM: computer hardware & software & DATA

DISPLAY/INTERACTION computer hardware & software (& sometimes data)

aesthetics
second approximation of a definition of computer art:

works created using computer hardware and software, manipulating data and expressing the results as varying forms of output.
hardware + programming + data

leading to various forms of output:

1. stuff we already do and can now do faster or more efficiently but not much differently:
   - video editing
   - photography

2. stuff we already do and can now do in a profoundly transformed way:
   - lifelike machines / automata
   - responsive installation
   - telematic and net art
   - social media
   - immersive games
3. stuff we really haven’t done before, though there are precursor forms:
   - generative art
   - database art
   - artificial life art
   - virtual worlds
   - hacktivism
Some of the things that computer artists examine and question in these kinds of works:

- the concept of REPLICAION without degradation
- the implications of Responsive systems
- what we mean by the term lifelike
- our fascination with rule systems
- the locus of authorship and agency
- the appeal of randomness
- game and play spaces as speculative fictions
- what it means to conceptualize art in terms of data
- the network as a domain of social power
a brief history of automata

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• automata had both religious (temple) and secular uses
• powered by forced air ("pneumatica") or steam
• generally of human or animal form
• idea of showing the gods operating in the human realm
The device, corroded by seawater; one of the few complex technological devices to survive from ancient Greece; had astronomical function.

Left: X-ray of the mechanism.
Above: Modern reconstruction.
Left: Temple automata, libation pourer and rooftop dancer.

Above: Revolving singing bird. Note the use of some of the 6 ‘simple machines’ of ancient Greece: wheel/axle, pulley, screw, wedge, lever, inclined plane.

“Pneumatica” ca. 3rd cent. B.C.E.
Left: Alexandrian ornamental fountain with singing birds and turning owl.

Above: Spouting dolphin, Italian theatrical device, ca. 16th cent. C.E.
Above: Diagram of a musical automaton consisting of 4 musicians in a boat

Left: A sketch for a drink-pouring automaton
Above: 17th century German elephant clock from Augsburg.

Left: A modern replica of al-Jazari’s 12th century elephant clock, in Dubai.

http://www.youtube.com/watch?v=doYPp-gaJ0o
Turriano “monkbot”, ca. 1560

http://www.radiolab.org/story/140632-clockwork-miracle/
Jacques de VAUCANSON (1709-82) was one of the great inventor-artists of the 18th century. Like Heron of Alexandria and Al-Jazari, he made automata, the three most famous of which are a flautist, a drummer, and most of all a “digesting duck”. Vaucanson’s central goal was imitation not just of the superficial appearance of life (how it appears, or mimesis) but of the biological functions of life (how it works, or simulation).

He also invented a mechanical loom that used perforated cards to control the loom’s operation. Twenty years after his death, another inventor, a weaver named Joseph-Marie Jacquard, discovered Vaucanson’s card-controlled loom in storage and used it as a prototype to develop a new version that still bears his name: the Jacquard loom. Each position in one of the loom’s punch cards corresponds to a hook in the machine that can be either raised (hole in card) or not (no hole in card). This in turn changes the position of the warp. In other words, it is machine controlled by a program stored on cards in binary code.
Jacques de Vaucanson (1709-82)

Left: Engraving of Vaucanson’s Tambourine Player, Digesting Duck, and Automated Flute Player.

Above: Photograph of either Vaucanson’s duck or a 19th century replica.
Left: Detail of engraving of Vaucanson’s Digesting Duck on its plinth.
Vaucanson’s Digesting Duck

Inner mechanism of Vaucanson’s duck
The automaton was “used as a heuristic device to illustrate the nature of the body, the state, and even the entire universe constructed by an engineer-God, functioning as the central emblem of the mechanistic cosmos of the classical Enlightenment.”
Pierre Jacquet-Droz’s trio of automata, the draughtsman, the musician and the writer (1768-74).
drawing by Jacquet-Droz’s “Draughtsman”

Above: Droz automaton drawing, ca. 1772.
Left: Neoclassical drawing of same period.

http://www.fi.edu/learn/sci-tech/automaton/automaton.php?cts=instrumentation
drawing by Maillardet’s “Draughtsman”
drawing by Maillardet’s “Draughtsman”
The first (ambiguous) claim made by a machine to being an author.
The Mechanical Turk (late 18th c.)

Left: the Mechanical Turk, constructed by Wolfgang von Kempelen (1734-1804)

Above: an inaccurate 18th century diagram of the Turk’s inner workings
The Mechanical Turk (modern replica)

http://www.youtube.com/watch?v=RdT4yG8wczQ
Amazon Mechanical Turk (early 21st c.)

https://www.mturk.com/mturk/welcome
Lifelike machines

- **intermediate** between humans and the gods (Greece)
- celebrate an **orderly** universe (Europe, Islam)
- **replicate** life functions rather than **represent** life (Vaucanson)
- attain some **identity** as “authors” (Maillardet)
- become a means of making labor **invisible**; conceal the **human inside the machine** (Mechanical Turk)