Empirically Grounding the Evaluation of Creative Systems: Incorporating Interaction Design

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Opinions / People

- **Economists: 3/2**

- **CC researchers: > 3?**

Theory

Computational Creativity is "*the performance of tasks [by a computer] which, if performed by a human, would be deemed creative.*"
Wiggins, 2006

Theory

Computational creativity *"sees the construction of working models as the most convincing way to drive home a point"*
Cardoso, Veale, and Wiggins, 2009.

Musical Metacreaiton

2009 "Human musicians routinely jam with cybernetic musicians."

2019 "Virtual artists in all of the arts are emerging and are taken seriously."

2029 "Many of the leading artists are machines."

**2099** "The reverse engineering of the human brain appears to be complete."

Ray Kurzweil, *The Age of Spiritual Machines* (1999)*.*

Musical Metacreaiton

"Iamus is a landmark in the sphere of computers and music, since what it writes cannot be differentiated by music written by a human being". Francisco Vico. Iamus project.

From interview with BBC. Jan 3rd 2013.
http://www.bbc.com/news/technology-20889644
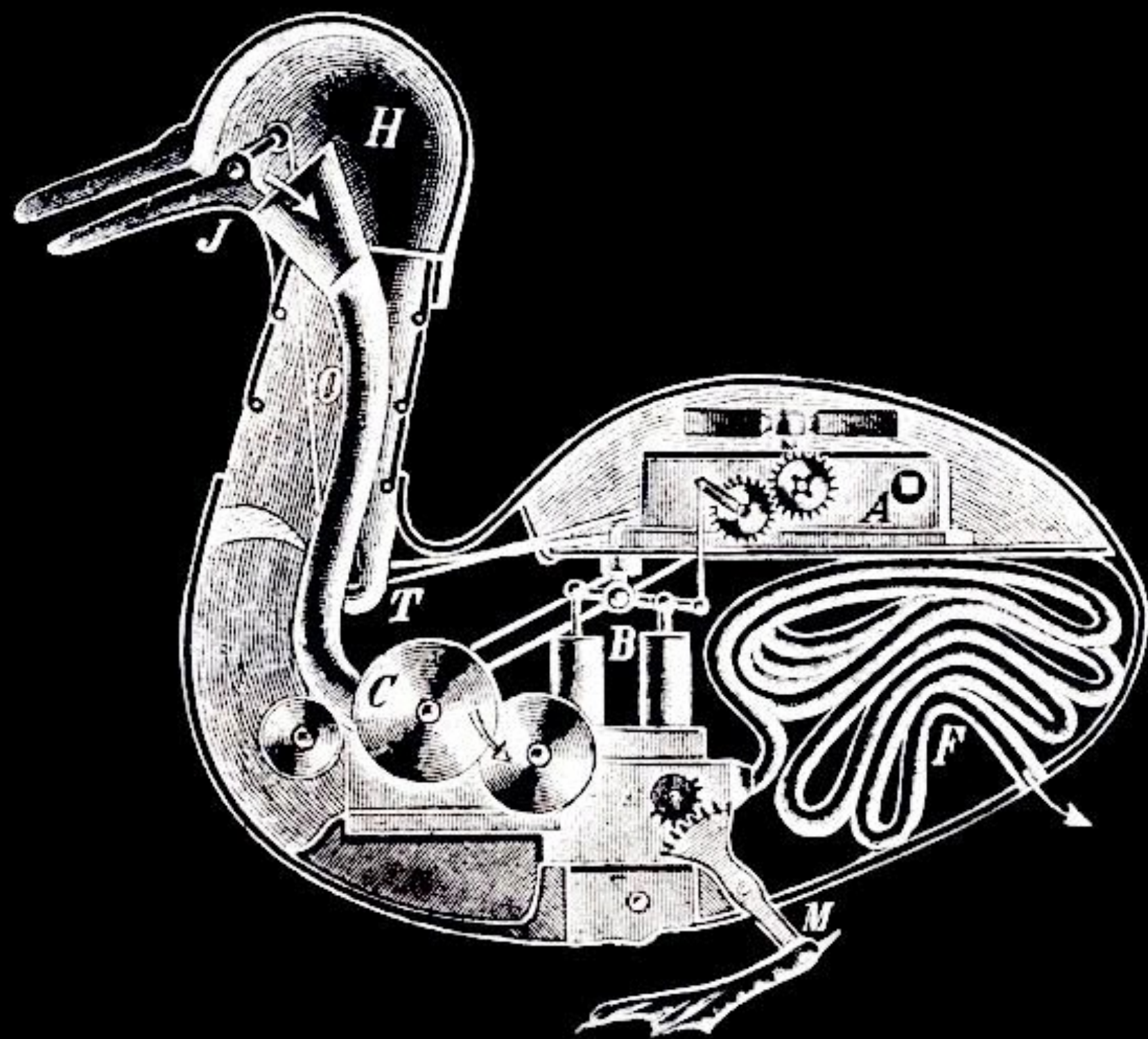
Empirical Grounding

Problem:

- How to indicate incremental improvements

- What methods *work* and how do they work?

Empirical Grounding

Interpretative concepts:

- 'Art expresses emotion' (the 'too hard' box)
- Poetry is very 'human' (adj)
- People have a kind of synesthesia

(in casual discussion).

Empirical Grounding

"soft" v "hard" science

Empirical Grounding

"[Some] areas are given the highly flattering name of hard science, because they use the firm evidence that controlled experiments and highly accurate measurements can provide, …[whereas]…soft sciences, as they're pejoratively termed, are more difficult to study for obvious reasons… You can't start… and stop [experiments] whenever your choose. You can't control all the variables; perhaps you can't control any variable. You may even find it hard to decide what a variable is."

Diamond, 1987, p. 35.

Empirical Grounding

"soft" v "hard" science

or

"flexible" v "rigid"
levels of operation

Empirical Grounding

Q: Which disciplines demonstrate good practice in dealing with those 'flexible' levels of operation?

Empirical Grounding

"If you want to understand what a science is, you should look in the first instance not at its theories or findings, and certainly not at what its apologists say about it; you should look at what the practitioners of it do."

Clifford Geertz (Social Anthropologist), 1973, p. 5.

Computational Creativity

"The definition of creativity is a deep pit of academic oblivion."
Tony Veale

"We need to talk about Creativity."

anon

Computational Creativity

Creativity

The textbook definition:
*the creation of **novel** and **valuable** things (perhaps **surprising**).*

Computational Creativity

There is a Social-Individual
Confusion

**main thrust
of the paper**

Clarify the relationship between *things being created* and *people being creative*.

Computational Creativity

Creativity

A better

The textbook definition: types of

the creation of *novel* and *valuable* things

(*perhaps surprising*).

The creation of
new types of things.

Types of Creativity

Generative	Adaptive
NO "VALUE" No need for cognition. Whenever anything comes into existence, generative creativity has occurred. Includes evolution by natural selection, social processes.	VALUE Requires cognition: goals, planning, design. When an agent sets out to solve a problem and comes up with a novel solution. "Normal" human creativity.

Types of Creativity

Generative	Adaptive
Evolution	Problem solving
Rock and Roll	John Lennon

Provocation

This framework helps highlight the pressing issue that
we don't really know what art is.

Evidence

- Hargreaves and North (1999): social functions of music.
- Salganik, Dodds and Watts (2006): winner-takes-all in artistic preference.
- Newman and Bloom (2012): Preference for originals over copies.

Evidence

Newman, G. E., and Bloom, P. 2012. Art and authenticity: The importance of originals in judgments of value. *Journal of Experimental Psychology: General* 141(3):558.

"The possessions of celebrities, such as President Barack Obama or George Clooney, lose value if their physical contact with the celebrity is undermined, as when the object is sterilized."

(with reference to Nemeroff & Rozin, 1994; Newman et al., 2011).

Implications

- Things get created without a "creator".

- Human artistic creativity has a *habitual* dimension.

- Value has social origin.

- Creativity turns to dust (the "deep pit").

What to do?

- Draw focus from "*is this system creative*?" questions.

- Rethink computational creativity evaluation in terms of the *study of interaction*.

- (Study models of computational creativity at the social level).

Interaction

- Evaluating creative systems must be done in context.

- The context is a "network of interactions", an ethnographic reality.

- Perceptions of creativity provide one data point.

- => Interaction design.

Interaction

=> Interaction design.

- Provides methodologies for dealing with "soft science".

- Situated in ethnographic reality, respects the uncertainty surrounding art.

Interaction

Occurrences of "interaction"* in ICCC proceedings:

- 3 out of 41 papers in 2013
- 6 out of 46 papers in 2012

* in the sense of interactions between humans and computers.

Interaction

"The aim…was to show how to make precise some factors which are of interest when assessing a potentially creative program, in order to illustrate a range of possibilities which would-be assessors of programs could select from, add to, or modify in a systematic way."

Ritchie, 2007, p. 90.

Interaction

Creativity Support tools. Examples:

DiPaola, S.; McCaig, G.; Carlson, K.; Salevati, S.; and Sorenson, N. (2013): *Adaptation of an autonomous creative evolutionary system for real-world design application based on creative cognition.*

Interaction

User experience

Less about efficacy with respect to function than a host of subjective qualities to do with interaction more generally, such as **desirability, credibility, satisfaction, accessibility, boredom** and so on.

Rogers, Preece, and Sharp, 2007.

Interaction

Cybernetics

\ˌsī-bər-ˈne-tiks\ - the science of communication and control theory that is concerned especially with the comparative study of automatic control systems (as the nervous system and brain and mechanical-electrical communication systems)

Merriam Webster Dictionary online
http://www.merriam-webster.com/dictionary/cybernetics

The Genie Metaphor

R. Plotkin, The Genie in the Machine, Stanford Uni Press, 2009

Automated creative systems act like *genies*:

You state a wish > the genie grants the wish

The Genie Metaphor

"Any sufficiently advanced technology is indistinguishable from magic"

Clarke's 3rd law

Actually a gradual progression in the history of computing, e.g., *compilers, live coding*.

Conclusion

- Pay more attention to "soft-science" methods.

- Recognise "generative creativity".

- => Draw on and *develop* "Interaction Design" methodologies.

- (And put *"is this system creative?"* questions on hold).

Thank you!

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