

# Understanding Digital Literature

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**What is  
“digital literature”?**

# Fingers are “digits”



But it's not ASL literature

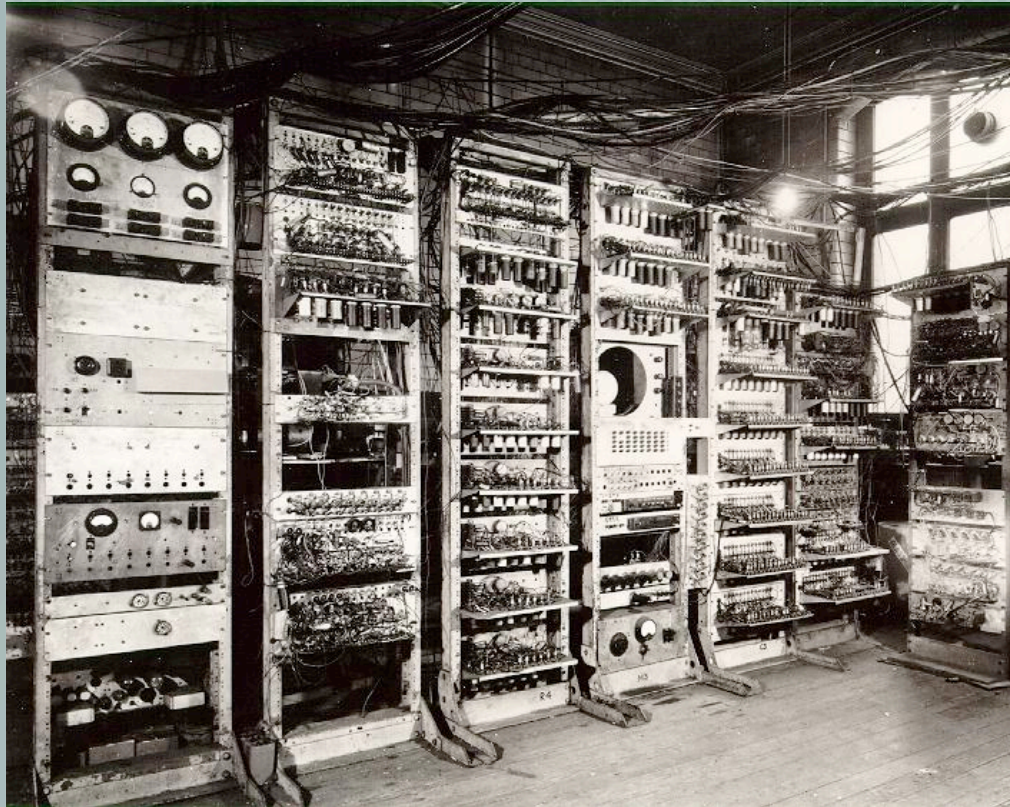
# Numbers are “digits”



But it's not numerical  
literature

Illegible blob  
Legless eggshell oozes oil  
Elegize his loss  
—Amos Latteier

# It's this "digital"



[ World's first stored-program electronic digital computer

Manchester Baby / Mark 1  
(left-hand side)

**Digital literature requires  
digital computation**

# The first piece of digital lit?

— [ Alan Turing, inventor of the “Turing Machine,” major contributor to breaking the WWII Enigma code, author of Mark 1’s programming manual, gay and out.

— [ Christopher Strachey, worked with Turing in early 1950s, also gay, produced what are probably the first pieces of digital art:

— a program that played tunes (“Jingle Bells” on radio, 1951)

— a love letter generator (first piece of digital literature?)

# ... but not discussed as lit

— [ Generator has been discussed from a queer studies perspective, but not as literature. Perhaps because the output isn't great:

— Darling Sweetheart,

You are my avid fellow feeling. My affection curiously clings to your passionate wish. My liking yearns to your heart. You are my wistful sympathy: my tender liking.

Yours beautifully, MUC

— [ But also, perhaps, because the output is the wrong place to look.

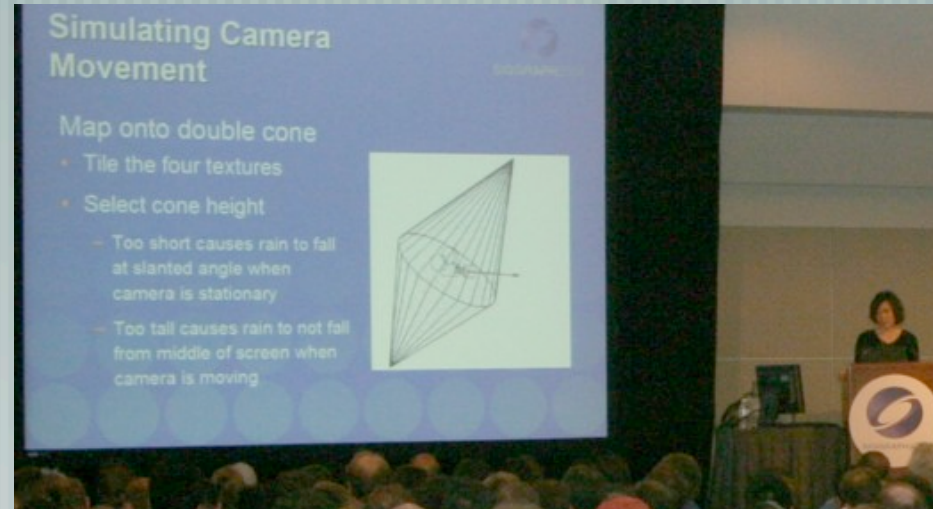
# Computer scientists != writers

- [ Turing and Strachey are famous for designing processes. That's much of what computer scientists do. The output doesn't tell us the process — it doesn't reveal the part that interested them, the part for which they used a computer.
- [ If we want beautiful text, we want a writer. Faulkner wanted *The Sound and the Fury* printed in four colors of ink. (We have a letter he wrote about it from around when Turing was working on the Enigma code.)

**What's a  
computer for?**

# The more familiar: graphics

At SIGGRAPH, computer scientists show rendering, animation, and user interaction systems. Innovation at the process level.



At SIGGRAPH, the biggest portion of the art show is prints, on paper, hung on the wall. Innovation at the surface level.



# ... and so with literary work

— [ Computer science work in digital literature innovates at the process level, often without surface text generation as a research topic:

— Believable characters

— Story generation

— Style-preserving natural language generation

# Writers != computer scientists

— [ Literary work in digital media is mostly, on a process level, “trivial.” There’s nothing about the way the underlying processes operate that’s particularly literary — it’s mostly on the surface:

— Animated Flash poems

— Node-link hypertexts

— Email novels

**But aren't we  
forgetting something?**

# Literary processes

— [ Writers have a history of designing and executing processes with literary logics:

— Oulipo

— Burroughs

— Cage

— [ And some of the literary work done in computer science contexts (e.g., lyric virtual reality) may involve processes that are quite complex (graphically, otherwise) but literarily “trivial.”

# Literary “process intensity”

— [ Chris Crawford, game designer and design theorist

— Process intensity is the degree to which a program emphasizes processes instead of data. All programs use a mix of process and data. Process is reflected in algorithms, equations, and branches. Data is reflected in data tables, images, sounds, and text. (1987)

— [ Rather than think of computer scientists vs. writers, we could think of works that emphasize processes vs. text/media.

# Literary processes & data

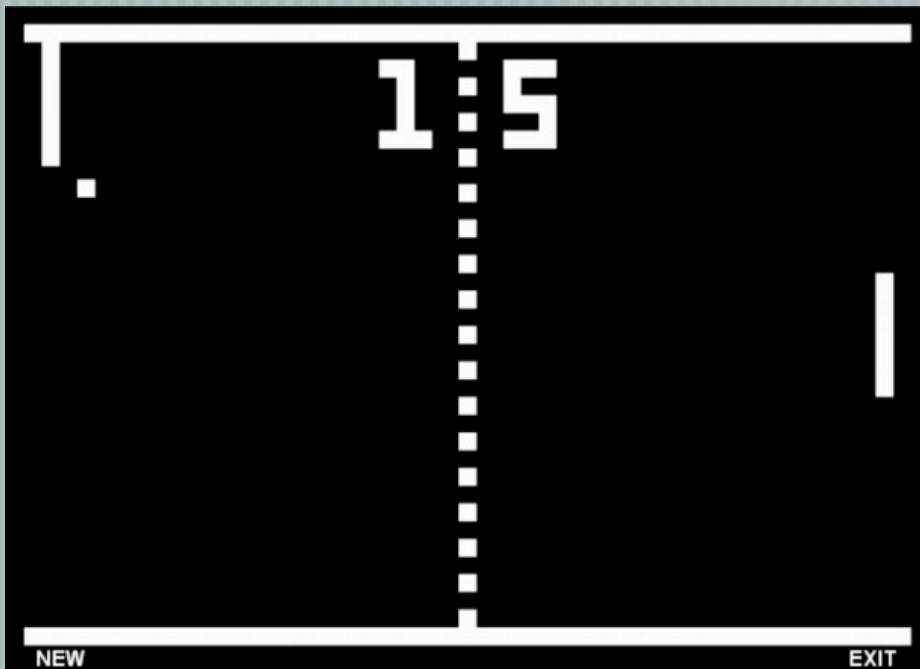
— [ Also, the possibility of attention to both process and data.

— [ And acknowledging that, so far, data-intensive digital literature is generally more successful as literature. (As with Strachey and Faulkner.)

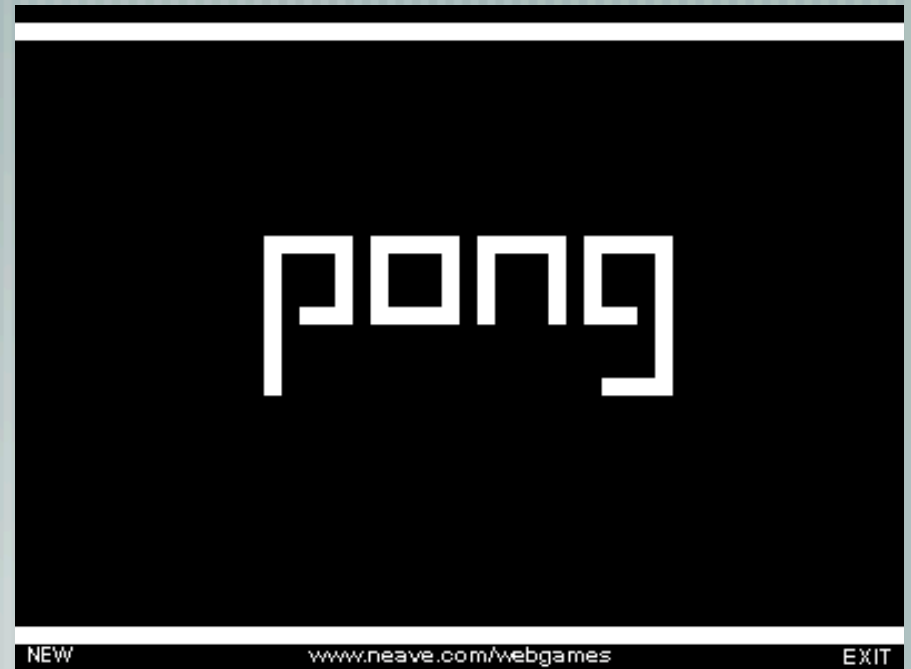
— [ Now, is that the frame we need to understand digital literature?

# What's the difference?

Returning to graphics, what's the difference between



this



and this?

Both were created by the same process, with the same data.

# The “Turing Test”

— [ Returning to Turing, the “imitation game” begins with a man and a woman each claiming to be a woman under questioning via teletype. (It’s textual, linguistic, in 1950.)

— [ Then the computer takes the man’s role — of contesting for the woman’s identity. (The queer studies angle.)

— [ Playing this game replaces the question, “Can machines think?” (The AI angle.)

— [ Playing this game requires interaction.

# Beyond “Turing Machines”

— [ Turing Machines are a common way of thinking abstractly about processes... but they don't account for interaction:

— Claim: Interaction-machine behavior is not reducible to Turing-machine behavior.

— Informal evidence of richer behavior: Turing machines cannot handle the passage of time or interactive events that occur during the process of computation.

— Formal evidence of irreducibility: Input streams of interaction machines are not expressible by finite tapes, since any finite representation can be dynamically extended by uncontrollable adversaries. (Peter Wegner)

# Distinctions between processes

— [ Which means we need to understand not just processes, but the role of processes. To start, we need to distinguish...

— [ (1) between (a) digital literary works for which computation is required only in the authoring process and (b) those for which it is also required during the time of reception by the audience;

— [ (a) includes Strachey's love letter generator, computer-generated books of poetry, etc. (b) includes literary uses of Caves, web browsers, cell phones, game consoles, etc.

# another distinction

— [ We need to understand distinctions...

— [ (2) between (a) those works in which the processes are defined in a manner that varies the work's behavior (randomly or otherwise) and (b) those that contain nothing within their process definitions that leads to variation;

- (a) includes Strachey's generator, interactive works, etc.
- (b) includes most Flash poems, email novels, etc.

# another distinction

— [ (3) between those that vary (a) without input from outside the work's material and (b) with input from outside;

— [ (a) includes Strachey's generator, and most poem and story generators, while (b) includes pieces that change based on the day's news, or user interaction, or other inputs.

# a final (initial) distinction

— [ (4) between those that vary with input (a) that does not include humans, aware of the work, among its sources and (b) that includes human input.

— [ (a) includes pieces that vary with network behavior (Carnivore clients, Ping Body), or the weather (Earth), etc; while it is (b) that includes popular forms such as hypertext fiction (Victory Garden), interactive characters (Eliza), and interactive fiction (Zork).

**So, have we  
got it now?**

# Another difference

How do we understand the difference between



this

**And Then . . .**

... we come around the corner  
into a village



and the assembled **villagers freeze**  
because  
they are in the "middle" of "something"

**There Is:**

- a) a bonfire
- b) the men all standing on one side,  
the women all standing on the other
- c) four rabbits  
tied to four stakes  
wearing **tiny** wedding gowns

and this?

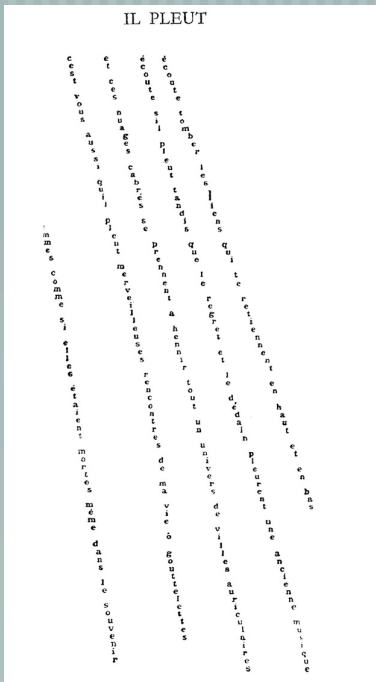
(Dracula and Blue Company are both epistolary novels.)

# Computation as context

- [ To understand what makes an email novel digital literature, we can't look at the text/media or at the work's processes.
- [ The work still requires digital computation, but as context.
- [ We need to understand this to grapple with digital literature that is "artifactual" (presented as computer artifacts) and/or engages the net art community (e.g., blog fiction).

# Another difference

How do we understand the difference between



this



and this?

(Il Pleut and Text Rain are both falling letters.)

# Computation in context

— [ One difference between *Il Pleut* and *Text Rain* is interaction.

— [ But the interaction mechanism in *Text Rain* is one's body. If our understanding of digital literature overlooks this, we're failing to grasp the work.

— [ When we understand that the processes of digital literature happen in context then we can engage digital literature that's connected to installation art (e.g., Bill Seaman's), locative media (e.g., Teri Rueb's), and performance (e.g., *Rest/Less*).

# Another difference

How do we understand the difference between

```
ZORK I: The Great Underground Empire
Copyright (c) 1981, 1982, 1983 Infocom, Inc. All rights reserved.
ZORK is a registered trademark of Infocom, Inc.
Revision 88 / Serial number 840726

West of House
You are standing in an open field west of a white house, with a boarded front
door.
There is a small mailbox here.

>open mailbox
Opening the small mailbox reveals a leaflet.

>read leaflet
(Taken)
"WELCOME TO ZORK!"

ZORK is a game of adventure, danger, and low cunning. In it you will explore
some of the most amazing territory ever seen by mortals. No computer should be
without one!"
```

this

```
>connect guest
Okay,... guest is in use. Logging you in as 'Green_Guest'
*** Connected ***

The LEGO Closet
It's dark in here, and there are little crunchy plastic things under your feet!
Groping around, you discover what feels like a doorknob on one wall.
Obvious exits: out to The E&L Garden

>out
The E&L Garden
The E&L Garden is a happy jumble of little and big computers, papers,
coffee cups, and stray pieces of LEGO.
Obvious exits: hallway to E&L Hallway, closet to The LEGO Closet, and sts
to STS Centre Lounge
You see a newspaper, a Warhol print, a Sun SPARCstation IPC, Projects
Chalkboard, and Research Directory here. Amy is here.

>say hi
You say, "hi"
Amy says, "Hi Green_Guest! Welcome!"
```

and this?

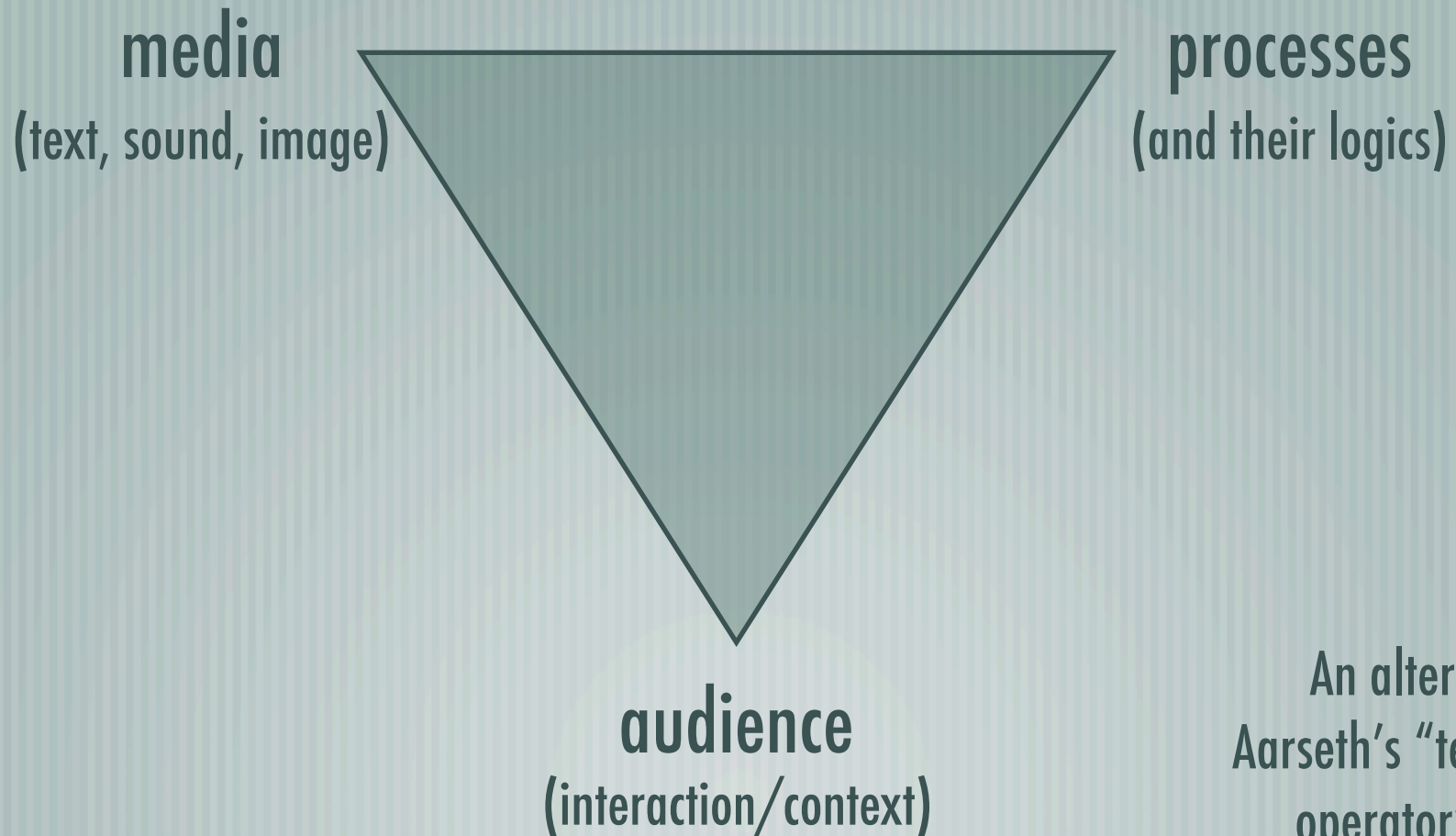
(Zork and a MOO are both explorable textual spaces.)

# Input from other humans

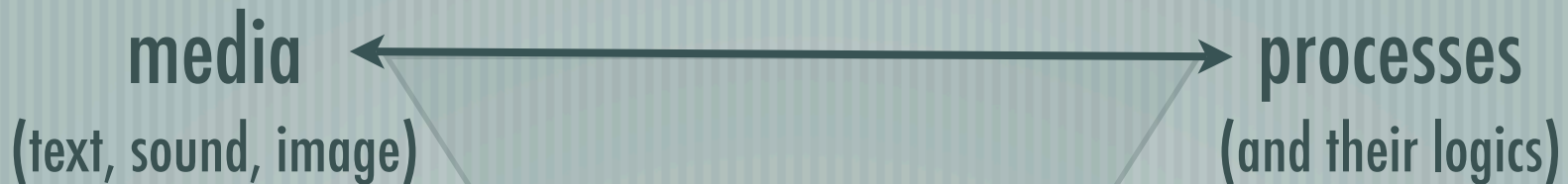
- [ What appears on screen might look the same in an interactive fiction work and a MOO (and in the single-player and networked version of a role-playing game).
- [ Similarly, the context in which we experience these works won't help distinguish between them (usually a PC).
- [ But if we don't understand the (massively) multi-participant aspects of some networked experiences then we will fail to grasp work ranging from "event teams" to alternate reality games.

**Which boils down to...**

# Understanding digital lit



# Understanding connections



The famous Doctor script was only one of those available for the Eliza system. As Janet Murray points out, it was successful because the rules and texts written were a good match for the capabilities of the system

# Understanding connections

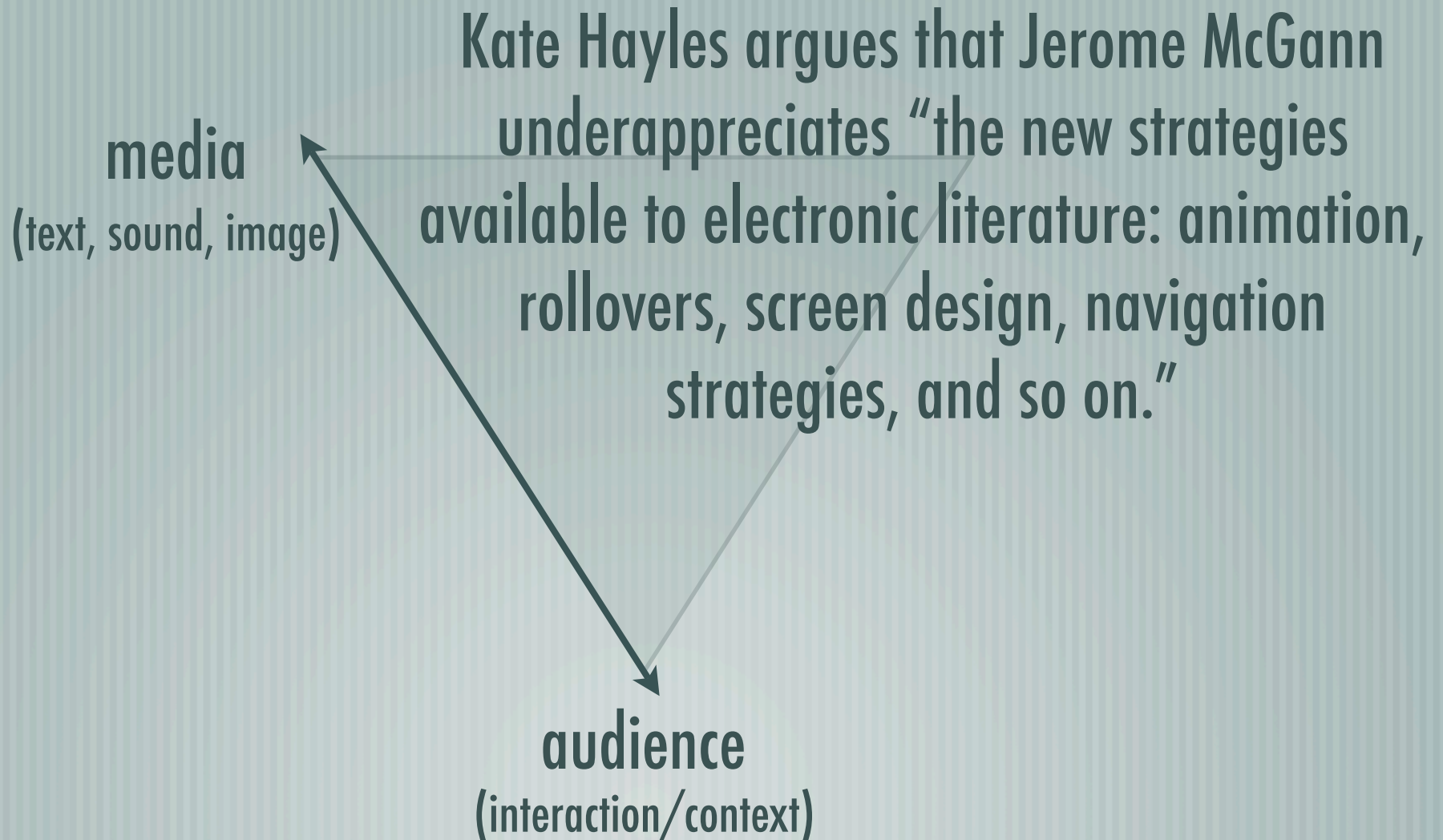
As Michael Mateas points out, the most successful interactive dramas (and related games) balance audience desires created by dramatic probability with support for actions that impact the work's processes in these directions.

**processes**  
(and their logics)

**audience**  
(interaction/context)

A diagram consisting of a triangle with a light blue fill. The top-left vertex is connected to the text 'processes (and their logics)' by a dark blue arrow pointing towards the top-right. The bottom vertex is connected to the text 'audience (interaction/context)' by a dark blue arrow pointing towards the bottom. The top-right vertex is connected to the text 'audience (interaction/context)' by a dark blue arrow pointing towards the bottom.

# Understanding connections



**What's needed  
pedagogically?**

# The hard part

media

(text, sound, image)

In the humanities we don't have much experience talking about processes. And in computer science most of the talk is about issues like efficiency – it's not that helpful for interpreting the literary aspects.

audience  
(interaction/context)

processes  
(and their logics)

# Engaging computer science

— [ Espen Aarseth's *Cybertext* is one of the most respected books on digital literature. Engages processes from a humanities POV.

— Writer-created processes are described (e.g., *10<sup>14</sup> Poems*) rather than reading surface text.

— Computer science processes are ignored (e.g., *Tale-spin*) in favor of reading surface text examples.

— [ This isn't because CS process descriptions are unavailable.

# Procedural literacy

— [ One approach, with a long history, aims at procedural literacy:

— Perhaps I may have been misunderstood as to the purpose of my proposed first course in programming. It is not to teach people how to program a specific computer, nor is it to teach some new languages. The purpose of a course in programming is to teach people how to construct and analyze processes. I know of no course that the student gets in his first year in a university that has this as its sole purpose.  
(Alan Perlis, 1961)

# Procedural literacy

— [ Michael Mateas teaches a procedural literacy course aimed specifically at digital media practitioners and theorists:  
“Computation as an Expressive Medium.”

— By procedural literacy I mean the ability to read and write processes, to engage procedural representation and aesthetics, to understand the interplay between the culturally-embedded practices of human meaning-making and technically-mediated processes.

— [ Uses Processing to start, moves to raw Java later in semester.

# Beyond procedural literacy

— [ Yes, abstract procedural literacy is valuable.

— Understanding processes, being able to interpret with/out access to code.

— Being able to communicate about, and collaborate on, the design of processes.

— Being able to design processes.

— [ But it's not enough.

# Those despised specifics

— [ Perlis and Mateas both dismiss students learning the specifics of particular languages and development environments.

— But there are important parts of digital culture we can't understand without them.

— What makes virtuosic code writing? Why the demoscene? Why 1-room Inform pieces? Why a Chess program in Inform?

— [ Luckily, there's no way to get procedural literacy w/o specifics.

# Plus some computer science

- [ Perlis and Mateas both want to bracket CS as a discipline.

- But digital media is built on CS research results.

- And the research is often ongoing.

- Most digital media students can't even form a web search for the ongoing CS research related to their area of study.

- [ We need a way for DM students to learn some CS vocabulary.

**My plans for the  
next few years**

# Two projects

- [ One presenting the broad field of digital literature, building up the model presented in the first part of this talk, surveying work mostly from a digital fiction theory/practice point of view.
- [ A second combining procedural literacy material with (a) some engagement with specifics of coding practice and (b) background in related computer science history and vocabulary.

# Thanks

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**PS –**

**I also make digital lit**

