Links: Exercises In Style

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ABSTRACT

New media were meant to augment our abilities and to liberate our understanding. We dreamed of fast access to unbounded libraries, of university-level courses delivered at minuscule cost to remote villages, of access to tools. We envisioned new literary forms and a new birth of freedom of expression unencumbered by the cost of chopped trees. Instead, we created systems that asymmetrically advantage liars and privilege cruelty.

CCS CONCEPTS

• Human-centered computing[Hypertext / hypermedia • Human-centered computing]social media • Social and professional topics[Social engineering attacks]

KEYWORDS

Hypertext, social media, literature, fiction, criticism, knowledge management, history of computing, politics, villainy

1 The asymmetric effects and advantages of new media

How did we come to this pass?

New media were meant to augment our abilities [15] and to liberate our understanding [31]. We dreamt of fast access to unbounded libraries, of university-level courses delivered at minuscule cost to remote villages, of access to tools [39]. We envisioned new literary forms [12] and a new birth of freedom of expression unencumbered by the cost of chopped trees[28].

What we got was Facebook, Reddit and 4chan. We got Jimmy Wales and Milo Yiannopoulos and Candy Crush Saga. We got Gamergate and the GRU. We got Donald Trump.

All this is not entirely our fault, or only our fault. But it is our fault; our new media ecology is the world we have made [8], and it is far, far from the world of which we had dreamt[29]. Our predicament arose, I believe, because the twentieth century discovered a set of beautiful, difficult, and powerful ideas — and we handed those ideas to knaves, fools, and villains. The same ideas were available as well to dedicated scholars, thoughtful policy-makers, and brilliant artists, but our world is not always a place of perfect symmetry and the systems we built seem often, in practice, to favor the abusive and to privilege the villain.

This asymmetry is arguably the defining property of our new media ecology.

Once we discussed hypertext rhetoric; that conversation stopped, not because we knew the answers, but because it seemed that the answers didn't matter, that links were a merely incunabular form, a step on the way to the holodeck [27] [7]. More recently, thoughtful consideration of link rhetoric has seemed irrelevant, indeed obscene, because the consequential uses of the Web today involve ignorant armies spreading brief, mendacious memes and anti-Semitic vitriol at the behest of totalitarian states [9].

In these desperate times, I propose to examine the asymmetries of new media that appear to benefit villainy, and then to examine ideas and designs that could instead offer asymmetric advantage for accurate observation, precise reasoning, eloquent presentation, and sustained virtue. The link is the most important new textual mechanism since the medieval invention of the comma: we ought to learn to use links well.

1.1 Locating Meaning

Where, precisely, do we find the meaning of a text? Following the Exercises de Style of Raymond Queneau [34], Stacey Mason and I have been exploring the many ways in which prosaic passages may be linked.

If Queneau begins:

> Some of us were traveling together. A young man, who didn't look very intelligent, spoke to the man next to him for a few moments, then he went and sat down.

we know exactly what he means. Or do we? The title of this exercise is *Litotes*, a rhetorical term for ironic understatement. Perhaps not looking "very intelligent" is meant to suggest its opposite? If so, "a few moments" might describe an interminable interval, and the simplicity of "he went and sat down" might describe action intended (but failing) to be performative.

Locating meaning was a central project of 20th century modernism. In literature, we had Hemingway and Hammett, Joyce and Proust; in architecture, Louis Sullivan and Mies; in

scholarship, the New Criticism and the social sciences. Student engineers and computer scientists are, indeed, the last true believers in the New Critical conjecture that all pertinent meaning can be found in the text itself, that writing and reading are a process of encoding and decoding mental states so as to minimize distortion and impedance. Neural networks can, in fact, be trained quite readily to perform textual tasks that we might have thought would require rich contextual knowledge: to identify a Twitter user's socio-economic status from a selection of their brief utterances [1], or to determine which young musicians are most likely to receive a recording contract from their travel itineraries [2].

Important ideological foundations of the Web are rooted in modernism. When Nelson says that "everything is intertwingled," he asserts that things and concepts are themselves inherently interlinked, that the links inhere in the things and are not merely added by one person or another for their own arbitrary or private purpose [29]. A later generation would ask whether "everything is intertwingled" is not merely a declaration by imperialist weblords that everything is ripe for their colonization.

Similarly, when Engelbart argues that augmenting human intellectual capacity would be desirable and achievable, he assumes that "intellect" is an observable phenomenon that can be augmented, rather than (say) the reflection of divine grace bestowed on flesh [3]. Notably (and, perhaps for us, fatally), Nelson's Xanadu is deeply concerned with flows of credit, credibility and copyright but assumes that, for the most part, writers don't want to deceive and readers don't want to be deceived; Nelson did anticipate clickbait [30] but not the wingnut echo chamber. Engelbart's agenda of augmented experts bootstrapping the creation of even better tools to reach transcendence (or the singularity), similarly, echoes related aspirations in revolutionary modernism — aspirations that also found expression in racial theory and the second world war.

1.2 The Truth Problem

After the war — and arguably because of the war — the High Modernist perspective on the text was shown to be too narrow and too simple. Readers bring a lifetime of experience and a wealth of knowledge to the text, and use all that experience and knowledge to construe its meaning. We do this all the time; when Hemingway writes [16]

> "Oh, Jake," Brett said, "we could have had such a damned good time together."
> Ahead was a mounted policeman in khaki directing traffic. He raised his baton. The car slowed suddenly pressing Brett against me.
> "Yes," I said. "Isn't it pretty to think so?"

this seems completely straightforward, uncomplicated, unadorned. Yet we need a lot of knowledge to understand it. When the car's slowing presses Brett against Jake, we know (for example) that the two were sitting close beside one another,

more closely than the geometry of pre-war Parisian taxis strictly requires. We know, too, why a young woman might sit so closely to a young man. We know that "pretty" is not a word an American man like Jake would choose out of habit or carelessness.

That the text cannot be fully disentangled from the reader seems, in retrospect, an obvious consequence of toleration. How can we know the dancer from the dance? The embrace of this consequence was a great project of the long 19th century. But if we cannot show from the text whether a church should be governed by cardinals, or presbyters, by the King, or by no one, if truth is no longer either revealed or unitary, then the status of truth becomes precarious. By the late 20th century, it seemed for a time that the very idea of historical truth was an illusion. That knowledge is situated, narrators unreliable, that discourse is a weapon to which Power exposes the bodies of her subjects, became the iterated understanding of the late age of print[1]. The ultimate resolution of these debates depended on the growing realization that, if all truth were socially constructed and subject to problematization, the memory of The Holocaust was equally subjective. This was, for scholars, a bridge too far: it's one thing to question the reality of the Peace of Nicias or the Fall of the Roman Empire [41], but to sanction Holocaust-denial when one had lived through the Holocaust (or knew people who had) was intolerable [14].

Again, essential intellectual currents that shaped our digital world stem from these sources, though that fact is seldom discussed. The functionalist, minimalist Web aesthetic associated with Jakob Nielsen [33], for example, rests on the understanding that signs on the Web — the color of links, for example — are mere social conventions. For Nielsen, it scarcely matters whether links ought to be be blue: links today are blue, users expect them to be blue, and so it is best to build upon that familiar convention. Similarly, the Information Architecture movement [35] strove to rein in the creatives, subordinating design to clarity, complexity to sincerity [5]. It doesn't matter how deeply things are intertwingled: what matters is what we can observe: how many ads we serve and how much product we sell.

This seemed innocuous enough when constrained to the field of designing web pages, but the roots of our current predicament are already clear. If everything (even "truth") is to serve the site's corporate ends, our natural destination is Breitbart and Stormfront — sites that invent stories resembling news in order to sell more ads and to inspire political followers. If everything is a game (or can be gamified), we arrive at Gamergate: harassment turned an entertaining collective pastime. If measurable outcomes are what matters, why not steal some passwords and use our site to disclose our opponents' email? Why not invent colorful (though untrue) stories in order to own the libs?[9]

1.3. Irresponsible

The universal concern in designing our new media ecology was fear that our media would be subjected to the control and

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[1] There are always exceptions. The sciences were largely exempt: if there is no objective world, science has nothing to do. Military history could fall back on battles, places where things clearly happened, things that mattered within the bounded scope of the military.

censorship of the state. MIT's Media Lab, for example, constantly assured us that

> *The Internet provides a worldwide channel of communication that flies in the face of any censorship and thrives especially in places like Singapore, where freedom of the press is marginal and networking ubiquitous. [28]*

This comforting notion was always untrue: two years later, China would build its great firewall. Yet it was widely accepted and, for a time, seemed a reasonable bet. The seeming threat was government regulation, and the chosen antidote was anonymity — anonymous bulletin boards, anonymous chat rooms, anonymous weblogs: a little encryption and a few passwords could, perhaps, keep the State at bay. If on the internet no one knew you were a dog, they couldn't throw you in the kennel.

This defense against state actors was always inadequate: all it takes, for example, for even a feeble state to unravel an entire network of anonymous weblogs is for its police to identify a single person who knows some of the weblog writers. Suborn them, either through bribes or torture, and entire network is yours [13; 36].

Yet the attack to which the web is now threatening to succumb — or to which it has already fallen — was not the power of State surveillance, but the use of anonymity to cloak the operation of intelligence agencies and conspiracies. Wikis, for example, were open to the contributions of all, and in a wiki, every contributor was equal and would be known by their work alone [20]. This worked, more or less, until Wikipedia's alliance with Google gave it sufficient influence to make it an attractive target. Wiki-style libertarian democracy, it turned out, is easily defeated by coordinated attack from intelligence officers, ideally further cloaked by myriad quasi-independent assistants. Editors who object may be shouted down, and extortion will silence even intractable opponents. Control of the platform not only gives the intelligence service control of an information resource; it also provides a useful way to spread disinformation and a platform from which rivals may be harassed.

1.4 Indifferent

As the Web grew to become not only a universal library but the central nexus of information and entertainment for much of the planet, our research became increasingly indifferent to examining how best to understand and to use links. Following the current fashion in computer science, research in hypertext and Web Science focused entirely on measurable phenomena: how much money a site made, or proxies for money like clicks, attention, favorable sentiment, or engagement. These measures abstracted away any real consideration of what a hypertext said or how well it said it.

2. Redressing Asymmetry

This litany of woes is daunting, and the situation is made still worse because many of the problems that arise from irresponsibility and indifference asymmetrically advantage villains. When extracting patterns from large bodies of data, for example, it is an advantage to have more data; those who can use stolen data can expect better results than those who cannot. The benefits that extortion and cruelty provide in online debate accrue to those who can deploy them and are denied to those who will not.[9]

Though new media gives villains and fascists important asymmetric advantages, it also gives some comfort to their opponents. First, though villains can deploy lies without number and can systematically test new lies for efficacy and reach, they remain lies and truth holds a unique position, one that once carried overwhelming authority. It could again; perhaps it still does.

Second, facts have a well-known liberal bias[2]: the arc of the moral universe is long, but it bends toward justice. Our experience shows that the overwhelming majority of our colleagues are not thieves, blackmailers, anti-Semites or Fascists, and that while such folk are distressingly common on Twitter and Facebook, and while we sometimes find such opinions among our neighbors, we seldom encounter them at faculty meetings or scientific conferences. The habits of research, of critical thought, of weighing evidence, of reasoning closely: the whole enlightenment toolkit of science and humanism remains at our disposal and is largely beyond the villain's reach.

Our advantage — if we have one — is that we can create better tools, better texts and better hypertexts.

2.1 Tools for Knowledge Work

We might begin by imagining and building tools that will aid in our work — especially tools that assist us but that villains cannot or will not use to even greater effect.

Scholarship thrives on citation and provenance, on knowing as accurately as we can exactly how an observation was made and precisely who made it. There are millions of lies and only one truth; it behooves those who study the world as it is to know what we know and how we know it. Our fallibility makes this all the more necessary, since we can be misled by mistakes just as by lies.

Provenance was the great concern of Xanadu, a hypertext system in which a text, once written, was immutable[29]. Texts could refer to other texts by transcluding them, and the reader could locate the original source and its full context with complete confidence in its authenticity. This alone goes a great way toward preventing the spread of fraudulent news: any reader can easily trace the source of an alleged quotation and can see at once whether that source could be expected to have actually observed what they report. Xanadu's centralized architecture offered security from spoofing and counterfeiting as well, although Xanadu might have been vulnerable to state-level subversion.

Convincing argumentative text, however, is not simply a curated string of syllogisms supported by verifiable quotations[17]. We might be able to write that way, but this is not how we write now, or how we have written. Moreover, villains may use citation in isolation to conflate truthiness — the appearance of evidential reasoning — with truth. Villains can, for

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[2] https://www.nytimes.com/2017/12/08/opinion/facts-have-a-well-known-liberal-bias.html

example, offer unimpeachable evidence of several facets of an assertion in order to confuse the audience about the deception that lies at its core.

In contrast to Nelson's universal literary machine, Engelbart placed great faith in creating tools that would use links to augment our ability to learn, to reason, and to design still better tools. Eastgate's work on Tinderbox pursues this agenda, seeking to make everyone's everyday knowledge work more effective[4]. A constructive hypertext system like Tinderbox facilitates the discovery of the emergent structure of difficult problems, problems that people explore over a span of months or years. Starting a research project, we can seldom anticipate the structure of our result: we can, at best, create a structure from which an answer will eventually emerge. Because that structure may change as our understanding grows, it is important to avoid premature formalization and to allow the work to adapt as it grows. A database needs to be well designed from the outset; in research, we seldom know enough at first to know just how to begin.

Spatial hypertext is a key tool for expressing relationships between notes that, at present, we understand incompletely or imperfectly. Early hypertext systems [21; 38] sought to keep ideas linked together by using link types [40] to describe the relationship. Here again, however, we encounter the problem of multivalence: two things may be related in a host of ways. Some of those relationships may only apply in certain contexts. Some relationships might seem sufficiently far removed from our practical concerns that it is not worth our time to express them. Not knowing what relationships might prove useful next month or next year, writers are tempted to omit them. Not confident in their understanding the subtleties of the system of link types, much less the actual relationship among new and perhaps incompletely-understood ideas or observations, writers come to rely on generic connections that defeat the purpose of link types. Spatial hypertext expresses relationships through the placement, size, shape, color, and other visible properties of a note.

Finally, let us consider the design of our tools. Since the advent of personal computers, software design has been deeply concerned with the experience of new users. After all, new customers are novices and the ecology of software sales depends on new customers; software designed to be sold to corporate managers tends to privilege the needs of those managers, and software designed to be sold directly to those who will use it tends to privilege the immediate needs of the prospective purchaser.

Managers want control, consistency, and workplace surveillance; these are the areas in which hypertexts sold to managers, such as course management systems, have sought to excel. Prospective customers want to be confident that they will be able to use the tool, and for decades almost everything in the design of hypertexts and electronic books for consumers has been subordinated to "usability," to the interests of the prospective customer [32].

Shallow tools that anyone can apprehend and master quickly are ideal for villains and state actors, each of which has ready access to quantities of unskilled labor. Today's social media tools provide asymmetric advantage to paid minions: legitimate users

care deeply about the matters they discuss and pay a substantial emotional cost when required to defend their beliefs or their friends. Win or lose, minions get paid. Rule-abiding users have one account; minions have many. Voluntary users can be persuaded to leave the platform with ease, while minions will remain as long as they are paid to persist. Each counterfeit post and each specious product review, moreover, makes the platform less trustworthy and sows discord and distrust among its users; these effects themselves may benefit state actors who sponsor those minions.

If we are to find an asymmetric advantage that favors enlightenment values, that advantage must likely be sought in deep tools — tools that are powerful and perhaps necessarily complex. A point-and-shoot camera is easy to use; the additional degrees of freedom afforded by a professional camera require understanding of optics as well as manipulating settings, dials and lenses, but can create images the simpler camera cannot. In the same way, not every task can (or should) be reduced to the touch of a user-friendly button.

In particular, we might consider abandoning our ancient quest for user interfaces that do not demand a grasp of fundamental elements of computing. Concepts like indirection, modularity, recursion, constraint, inheritance and composition are not trivial or friendly; it takes weeks or months for our best students to master them. Once mastered, these concepts help those students accomplish what they could not achieve without them. (That the concepts are themselves beautiful is not to be despised.) Yet we have worked hard to hide those concepts, and the need to master them, from those who are not students of computing. This is an error.

2.2 Literary Machines

Our primordial vision of the Web held that it would be a universal library, a way to give everyone access to the resources of the arts and sciences and the tools of scholarship [42]. Though it was recognized from the start that this access would sometimes have embarrassing consequences [19], the vision was buoyed by an underlying faith that, given reflection and contemplation, most people would find understanding [3]. Access to information [39] seemed the remedy to propaganda and ignorance, and the initial architecture of the Web and blogosphere was not inconsistent with that goal.

What tools can we bring to oppose propaganda and cant?

- Depth, letting us master the material rather than polling experts and accommodating, through links, varieties of background and temperament.

- Permeable texts, letting us see the paintings we are discussing, translate passages we don't understand, review the raw data, or reframe analysis.

- Reputation and responsibility, allowing us to give our trust to those who have earned it and withhold it from those who have deceived us.

Replacing the blogosphere with Facebook and Twitter improved its usability for casual readers while removing almost every trace of depth, permeability and responsibility. Social media disfavors depth; depth sells no ads and links lead people away from our

next advertisement. Permeability, too, tempts readers to engage elsewhere, not with our next ad. In the service of anonymity and a simulacrum of privacy, social media platforms happily surrendered themselves to trolls, lobbies, and spies who were working to deceive readers and disrupt societies; the platforms were happy to oblige the villain because villainy attracts clicks.

2.3 Writing With Links

Writing with care and skill can express what otherwise cannot be said. Here, too, the enlightenment may find an asymmetric advantage.

Skillful selection of the boundaries of the writing space, of the links among them, and of the links within them all influence our experience of the hypertext. Much of our literature (*pace* [25]) assumes that our concern is simply comprehension and usability, and our goal is to perform almost as well as paper. We can do far more[11].

One of the oldest and simplest controversies of new media asks how best to divide a notionally-continuous text into lexia (or pages, or writing spaces). Should a hypertext aspire to seamless continuity in support of the perfluent narrative dream, or should it expose its structural members[37]? If continuity is desired, is that best achieved by making transitions more efficient or by fluid animation of the transitions [43]? If we wish to emphasize the discrete charm of the hypertext unit, how big should the lexia be? In particular, should lexia acknowledge the size and nature of a screen that had (in those days) perhaps 512×348 pixels? Or should the unit be larger than the screen, privileging scrolling within the page and linking outside it?

Let us begin, following Queneau[34], with a mundane narrative[22] .

> *I crossed the street to the convenience store. The rain soaked my boots. I found the last pint of chocolate chip in the freezer. The clerk tried to pick me up. I said, No thanks. He gave me this creepy look. I went back to the apartment, and finished it all in one hour. Alone at last.*

How might we divide this passage? We might, perhaps, simply divide by sentences.

> *I crossed the street to the convenience store. → The rain soaked my boots.*

We might divide the story instead into dramatic beats[23]: the journey to the store, the unpleasant encounter, the return to isolation and despair.

We might instead isolate the protagonist's throughline, treating the rest as annotation:

> *I crossed the street*
> *I found the last pint*
> *I went back to the apartment*

We might instead isolate the antagonist's throughline, reducing the protagonist's role (for the present) to annotation.

> *The clerk tried to pick me up.He gave me this creepy look.I had gone across the street to the convenience store.The rain had soaked my boots.A pint of chocolate chip was all that was left in the freezer.I said, No thanks.*

We might call attention to the narrator's underlying predicament by offering diegetic links:

> *I looked through the window at the convenience store.*
> <u>*Cross the street.*</u>
> <u>*Call Naomi instead.*</u>
> <u>*Not that she'll answer.*</u>
> <u>*Find that bourbon.*</u>

Greater scope for skill may be found, of course, when working with richer topics in a larger frame. Yet even here, precise boundary choice and accurate link placement [11] can prove powerfully expressive. We have, in recent years, almost entirely ceased to consider the craft of hypertext as a pursuit worth exploration or a discipline worthy of mastery, yet this, too, is a discipline where we ought to have a profound advantage over the villain. Alcibiades may offer fun and thrills, but Democracy holds that more sober counsel will ultimately prevail.

2.4 A Better End

We write precisely and deeply because we aspire to convince people, to find what is true and to share that truth and by doing that to render simpler service in our common need. Villainy's focus on deception and deceit keeps the villain focused on the humanity of their audience. We sometimes forget. We have known since antiquity that truth is effective, but truth must be assisted by clarity, by graceful expression, and by concessions to human frailties, to the limits of patience and attention that human audiences necessarily impose.

Actual language, including actual hypertexts, seldom if ever means one thing: multivalence is not a vice[10]. When we try to ignore this — when our research studies only comprehension or when our systems generate text from trivially intentional models — our writing is "on the nose" and our audience mistrusts us.

Nothing teaches us to write with links more effectively than striving ourselves to write with links — not mere exercises, but challenging work that matters[6; 18; 24]. Our disciplinary focus on evaluations and our urgent, if unfruitful, desire to be a science can distract us from this obvious need. It may matter little whether the work we compose is good or bad; much can be learned by striving and studying a craft, even if we do not in the end master it.

Nor should we dismiss the arts — narrative, painting, dance — as playthings for children or mere entertainment. Rhetoric explores how we may make an argument that is compatible with human limitations, but it is Clio, the muse of narrative, who instructs us in addressing people as they are: impatient, hungry, distractible, and always eager to induce a causal explanation for any observed set of facts. Our long exploration of nonlinear narrative is not merely a Bohemian prank or academic toy, but rather an exploration of emotional and intellectual engagement in a world where, we now understand, neither the text nor our experience are fully determined[6].

This is hard work, which villains dislike. Art takes time and life is short; villains want a fast buck and a quick payoff. Computer Science generally and Human-Computer Interaction specifically have separated themselves from serious consideration of the arts in new media, thereby abandoning one of our precious advantages over our adversaries. That we cannot immediately prove what is good need not lead us into assuming

that we need not consider goodness, nor should we confine our scholarship to the measurement of those phenomenon most convenient to our current instruments.

2.5 Making cruelty less fun

Organizations that train people in fighting share a constellation of surprising qualities. They often require students to dress in arcane uniforms, and those uniforms tend to be simple, unsuitable for other wear, and to be based on the clothing of peasants or other individuals of low status. New students are expected to learn complex rituals which seem to have little relationship to fighting. Students are frequently required, moreover, to display respect for and submission to instructors and more senior students. We see these in martial arts studios, in police academies, in military training facilities. Why is learning to how to bow or how to salute important?

Some people want to learn about violence because they like to hurt people. Long experience has shown that a number of these people are also deeply conscious of status and anxious regarding their own status: they don't like to dress up in silly outfits. Many are angry; they don't like being told what to do, and they dislike pointless and ritualistic distractions from the delights of hurting people. They dislike, too, being at the bottom of a hierarchy: if there must be hierarchies, they prefer to be at the top. These mechanisms exist, in short, to make training unattractive to people who ought not to be trained in violence; there may have been martial arts societies that lacked these safeguards but, over time, society has not permitted them to continue.

How might we make new media less attractive to those who enjoy cruelty?

First, our platforms can promote responsibility by making it possible to punish the irresponsible. Wikipedia, for example, requires new users to make a modest number of useful edits before they qualify for an account name, and then they must make a larger number of useful edits before they can edit controversial pages. These barriers are very modest, yet they do serve to deter some forms of bad behavior: people don't want to start over and casual users cannot easily set up dozens of fake accounts. (That the barriers are insufficient to deter attacks organized by states, organizations, or even dedicated villains is, unfortunately, a cause of lasting mischief to Wikipedia and allows Wikipedia's use as a platform for defamation and extortion.)

Second, punishment cannot be the province of the platform owner alone, because the platform often benefits from cruelty. Bitter arguments build engagement and engaged users see more ads and write more posts. Nazis and racists may be bad for society but they are a dedicated audience, and they, too, buy soap.

Former media ecologies sanctioned liars by making their propensities known and by recalling their misdeeds whenever they appeared. The curated blocklist is a step toward this: during the original Gamergate emergency, a list of several hundred troll accounts was shared among targets of harassment. This was a blunt instrument, catching some innocent accounts as well, yet the alternative is to allow villains to deprive any target they like of the ability to read or write social media, simply by flooding their account with drivel. A better solution might be a marketplace in curated blocklists, competing on precision and recall and earning payments from grateful customers that would finance further refinement. Had a list of Russian troll accounts been available in 2016, the world might be a better place today.

3   The better angels

In his essay on "electronic literature after the fall", Stuart Moulthrop was, I think, the first of the hypertext pioneers to fully accept the desolation of the Web[26].   Yet even he, uncharacteristically, misses the enormity of our situation: it is not the realization that the Web has been seized by the military-entertainment complex that troubles us, but the realization that we have systematically designed and engineered our new media for villainy.

Much of our current research aids villains more than it aids us. Automated sentiment analysis can reveal to our adversaries inchoate desires that they can use not only for their profit but also for our destruction. That we can extract from Web histories a collection of women who are pregnant — some of whom do not know they are pregnant — is a marketing opportunity. That the same technology could be used to identify women who might soon want an abortion before they are pregnant — indeed before they have sex — and convey that information to anti-abortion activists and zealots is to automate for base ends what once was reserved to angels.

Today, platforms benefit from cruelty and profit from lies. Yet, our research papers often claim to be motivated by a desire to reduce the labor costs of the platform owners. This is perverse and also, often, dishonest: our chief interests are to understand computation and to understand ourselves, to let machines do what once only people could attempt.   We should understand and embrace our true desires and cease to pretend that we are all working for Pharaoh.

The core challenge for hypertext and the Web has always been the embers of the Two Cultures problem, the tension between art and science. Computer science has been anxious to protect its status, and those parts closest to the arts and to industry, disciplines like ours where computation meets minds, have been deeply affected by that anxiety. We must put this behind us. Writing well is an art. Systems for writing are engineered — made by us and for us, not born or ordained. To understand writing is to understand signs and to comprehend communication,

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