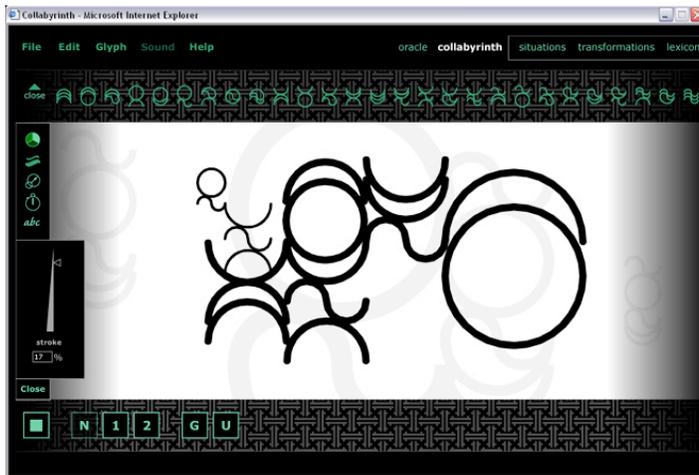


# From Interface to Interspace: LiveGlide and the 3<sup>rd</sup> Dimension

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**ABSTRACT:** The Glide project is an ongoing series of explorations into the new possibilities for writing and for language itself enabled<sup>1</sup> by the computer. Glide is a visual language, a system of discrete signs or glyphs that can link and morph dynamically. Glide signs carry significance and behave semiotically. Current research moves the writing space from planar inscription into the 3<sup>rd</sup> spatial dimension. Some implications of this added dimensionality are examined using a theoretical framework derived from N. Katherine Hayles recent work, *Writing Machines*, [5] which foregrounds the importance of materiality in the production and reading of technotexts.



The Glide Collabyrinth

**KEYWORDS:** Writing technology, visual language, material metaphor

## INTRODUCTION

In the narrative world of *The Maze Game*, [12] Glide takes several forms: as a secret, gestural language; as a physical maze on which a game is played; as a written language for making poetry and philosophy; and as a computationally assisted oracle. Outside the narrative, Glide functions as a model, a would-be language, a “highly abstracted version” of a language, “based on

theories about what ‘worlds of experience’ are like.” [4]: As such, it can be viewed as a strictly delimited system, a set of simple forms with which to experiment. But language, especially language about language, resists simplicity. As a model, Glide faces two worlds simultaneously: the ‘real world’ and the ‘narrative world.’ Glide is already an interface, or, more properly, Glide models the interfacial or mediating nature of language, the sense in which language *itself* is the modeling machine that generates all models. What began, just sentences ago, as an effort to describe, metaphorically, a two-sided mirror-sandwich with (a model) language in between, rapidly ran to the self-reflexive, a move which marks any effort to model language, to use language to talk about *itself*.

This confounding in one object, Glide, of a narrative and a theoretical discourse, lends itself to a literary theory informed by science, as found in the works of N. Katherine Hayles and David Porush. Porush uses metaphors drawn from science to talk about this hybrid discourse:

In brief, one of the most important consequences of this postmodern shift is a reevaluation of the relative veracity, or epistemological potency, of literary discourse versus scientific discourse. To put it another way, in my view there is another synthesis consequent upon Prigogine’s theory: a collapse of the epistemological value—though not stylistic or generic distinctions—of scientific over fictive discourse. [9]

Scientific discourse has had great success in describing the experienced world in its aspect as material ‘stuff’ accessible by the body’s senses and their myriad extensions. Literary discourse describes with equal vigor the ‘non-stuff’ of mind, imagination, dreams, emotions: all that is ‘immaterial’ or ‘subjective’ in our experience, accessed by the ‘non-senses.’ The effort to describe a linguistic system such as Glide that confronts both discourses with a different model of language *itself* unearths epistemological quandaries that go beyond the choices made in situating a discourse. Epistemological challenges acknowledged, it is nevertheless hoped that modeling new ways of expressing and utilizing linguistic forms with Glide can provide abstractions that can be generalized to other potentially semiotically charged systems growing at or outside the boundaries of natural language.

## THE MATERIAL METAPHOR

The spatially dimensional aspects of regulation and organization of the Glide linguistic system are described in light of what N. Katherine Hayles calls in *Writing Machines* the “material metaphor.” [5] Hayles stresses the essential importance of understanding not only the text (in the broader Barthean sense) of the literary production (print or electronic) but equally the materiality of the medium of production, in this case, “the symbol-

processing machines we call computers.” [5] Hayles continues, “To account for this traffic I propose material metaphor, a term that foregrounds the traffic between words and physical artifacts.” [5] Hayles describes the computer as an inscription technology and makes the claim that

the physical form of the literary artifact always affects what the words (and other semiotic components) mean. Literary works that strengthen, foreground, and thematize the connections between themselves as material artifacts and the imaginative realm of verbal/semiotic signifiers they instantiate open a window on the larger connections that unite literature as a verbal art to its material forms. To name such works, I propose “technotexts,” a term that connects the technology that produces texts to the texts’ verbal constructions. [5]

After a few hundred years of dominance by one species of writing machine—the book—we are in a Cambrian explosion of new species. First we experienced the electromagnetic proliferation of new media possibilities, then the digital computer, and now the cross-breeding of the two. The computational platform is evolving rapidly. Emergent forms of literature, (A)life, and language issue from the technotextual environment. The life-forms and life-cycles of species of media and genres of technotexts created in this evolutionary abundance are prone not only to rapid mutation or ‘generational upgrades’ (the language equally of 1<sup>st</sup> and 2<sup>nd</sup> generation electronic literature and 1<sup>st</sup> to n<sup>th</sup> generations of processors) but to sudden mass extinctions. Both Bruce Sterling’s Dead Media Project [13] and Tolkeinesque pronouncements of the passage of the “Golden Age of Hypertext” are inventory reports from the fossil factory. This swarming media ecology is clearly not for the faint of heart; the temptation to retreat to the relative safety (!) of printed words on paper is sometimes irresistible. And just as we attained some level of comfort with keyboard, mouse, and desktop metaphor on screen, lulled by successive re-mediations into the illusion that we’re dealing with a more flexible typewriter and a vertical piece of paper, *how we write*, in terms of the physical acts by which we maneuver the devices of our inscription technologies, seems on the edge of radical change.

#### HOW WE WRITE

Consideration of *how we write*, in the sense of bringing new genres, means, and multi-sensory components (new *materials*, in both the substantial and insubstantial meaning of the word) introduces a dizzying variety of semiotic objects and systems, in addition to the written and spoken words of natural language, to the technotext. These additional materials and means include the specialized writing *in* the environments of computer programs (Flash, Photoshop) and the writing *of* computer programs that then, behind the scenes (or screens) write our technotexts. This teeming, unstable evolutionary soup shows no sign of settling into a stable set of genres,

means, and components. These accelerated Darwinian survival stresses deeply affect *how we write* as a subjective experience. The date-stamps of the shelf-life of any given technology have a chilling effect on expectations of immortality. The clear trend toward fluidity (if not meltdown) in formerly less fungible notions of authorship, collaboration, intellectual property, and obsolescence contribute to the angst of the shredded remains of the solo artist as romantic ego. To ignore the materiality on either side of the technotext is to lose, literally, our grounding, or what there is left of it in this shifting terrain. And it may be to miss a key point: in the anxieties of multiple online identities, flickering signifiers, and obsolescence, not only of our works but of our theories about them, there are at least some signs of re-embodiment on the horizon, an invitation to—quite physically—dance with our machines.



LiveGlide: the 3D interspace.

*How we write* involves a physical relationship with inscription technologies. Hayles defines an inscription technology as follows: “In order to count as an inscription technology, a device must initiate material changes that can be read as marks.” [5] The three-dimensional interspace is already long with us in arcade and computer games, and game-systems. New input devices for gamers such as variations on the dataglove are beginning to take hold in the mass market.<sup>2</sup> How our bodies and minds participate in new ways with the new input devices is explored in the 3D LiveGlide interface. We are exploring a variety of input devices: a joystick, a P5 gamer’s dataglove, and, most recently, a small MIDI board with four mode buttons and eight sliders to inscribe three-dimensional morphing Glide signs in a three-dimensional space of inscription. The choice of input device is not an expression of gratuitous gadget fetishism but, in fact, a search for a more sensual and intuitive

approach (though still distressingly awkward) to inscribing the Glide forms as three-dimensional objects traveling through a world-space. The joystick and data-glove devices *potentially* bring, through mapped gesture, the act of Glide-writing full circle to its gestural origins in the fictional world of the The Maze Game. [12] The reality of an inexpensive sensor system (the P5 dataglove) that still confines the hand to a small area is far from achieving a flowing gesture. The joystick gives a more intuitive driving sensation, and grabbing and moving a phallic shape back, forth, and around embeds a certain sensuality of its own. The aesthetic is probably more appropriate to the masturbatory jerks of 1<sup>st</sup> person shooter games than Glide gestures. The MIDI board with its delicately controlled multiple sliders whose sensitivity can be tuned as well as mapped to the user's choice of visual qualities (elements of Glide writing) is the most successful experiment to date. The sliders *glide*. The shifting of input device in the act of writing may affect cognition as well. Writing natural language by voice (speech to text) is still a Holy Grail of technological freedom, not yet perfected, but seeping into use. Freeing one's hands from the keyboard has the additional implication, foregrounded in Glide, of freeing writing from the alphabet. This move (whatever its implications in what Leonard Schlain details [11] as the long war between word and image) is suited to the non-phonetic Glide system of signs. The glyphs have no referent to a spoken language; they *may* be ideographic. David Armstrong and other theoreticians of signed languages [2,3] explore what happens to our brain/mind circuitry when language is gestured into being. These and other cognitive implications are only mentioned as other pathways to explore. *How we write* with new inscription technologies may be moving us beyond remediation of existing writing practices into new territories of meaning-making. If we inscribe our marks with less physical restrictions, and more sensuous expressiveness, new cognitive pathways could be opened.

#### WORK/PLAY ON BOTH SIDES OF THE INTERFACE

To understand the “non-triviality” of the effort necessary to traverse the ergotic cybertext [1] [5] (where reading takes on the dimension of navigation, the steering or *kyber* of the text) an examination of the materiality on both sides of the interface—that of machine and that of embodied “user” or “interactress”—is, once again, helpful. In addition to the multi-sensory perceptual processing occurring in the brain/mind of the user of (motion, color, sound, etc.) of the multimedia technotext, the user performs further additional mental work in being called upon to make choices of direction/sequence. She is often called upon to engage the text beyond narrative, poetic, and or expository modes (as in “serious hypertext”) into one or more dimensions of game/play. The engagement can be competitive—including the experience of playing *against* the author who has provided her with the puzzle of figuring out how the technotext *works* (considered by some the frustrations of

the text, by others the learning curve, yet others, not merely the foreplay, but part and parcel of the technological main event). She can be found playing—with or against—the machine/interface, as in Stuart Moulthrop's “Hegirascope” [8] or Talan Memmott's “Lexia to Perplexia” [6] where the habitual need to consume all the words of a text (like all the food on your plate) is exposed. In both pieces, the reader tries to gobble words before they—or the choice of next course—are obscured or snatched away, by an invisible timer or sometimes by (oops!) an inadvertent or unintended gesture of the mouse. In works such as Nick Monfort's Winchester's Nightmare, [7] she is more explicitly playing in a computer game genre—the adventure game. In the environments of electronic technotexts, circa 2003, the interactress is frequently more physically active than the book reader whose main movement is of the eye; less active than an arcade dancer<sup>3</sup> or a Nintendo player. The trend in technotexts (in the broadest sense, including immersive, sensor-based interactive spaces) is clearly in the direction of more motion and more physical involvement as sensor systems, wireless devices and wearable computing of all sorts free us from fixity in front of screen and keyboard, just as the Walkman and the cell phone have added degrees of freedom to our speaking and listening. This physicality on both sides of the interface, is leading to a more and more intimate coupling between body and machine, especially as machine and body inter-adapt. The handheld phone becomes a hands-free headset; one learns a certain *sotto voce* trick to have a private talk on a cell phone in public. The underwater telephone (yet more mobility) pioneered by France Telecom [16] bypasses the ear, conducting sound through the bones of the teeth. Our most ubiquitous technotexts—the streams of email—can arrive now on the mobile phone. Phone-blogging—the ability to weblog not only from a laptop in a wireless environment but from a cell phone (which can also take pictures)—is opening the door further to a radical democratizing of journalism.<sup>4</sup>

Three-dimensional LiveGlide explores the possibilities not only of writing but of reading/navigating in the 3<sup>rd</sup> dimension. To play with or watch the Glide glyphs in two or three dimension is one level of engagement afforded by the interactive playspaces. To make the intellectual effort to learn the language as a language, to create and/or read Glide texts as meaning-generating symbolic forms is quite another “ergodic” task. Part of what makes the amount of work expended in an ergodic text “trivial” or “non-trivial,” is the relative visibility or invisibility of the interface<sup>5</sup>, a condition which is not a permanent quality but which changes through use. The interface of print on paper in the physical artifact of the bed-and-bathtub-compliant book has long since become invisible, in the same way the rather more complex interface of the automobile becomes invisible once learned and habitually used. The axis of keyboard-mouse-screen and the conventions of browser clicking, linking, and navigation have become invisible as well—for most. This invisibility

has to do with the nature of conscious attention. The learned interface recedes to the background of focal awareness.<sup>6</sup> Language-as-interface between world and human mind is a non-trivial piece of learning, for child or adult. Once learned, it becomes relatively invisible. And few things are more enticingly opaque than an undecipherable text, once recognized as holding meaning.<sup>7</sup>

### DIMENSIONS OF DIMENSIONALITY

The unifying vision (inseparable from the material metaphor) of the Glide project today, moving into the 3<sup>rd</sup> spatial dimension, can be expressed as a search for increased dimensionality in language that can offer new symbolic tools for human communication, different means of making meaning, perhaps new channels through which we can tell others what we've seen, felt, and known or tried to know. The Glide interactive applications, or playspaces, invite the user to create and interpret technotexts. The Collabyrinth and the Oracle [13] are environments in which the user can experiment with Glide writing and reading in two dimensions.

The nature of the medium of the computer as simulation engine is essential to understanding the genesis of Glide's technowriting, its evolution from two to three dimensions, and its expansion into the time dimension. Hayles states,

In the new millennium, the digital computer has emerged as the most powerful simulation engine ever built. Computers are much more than hardware or software. In their general form, computers are simulation engines producing environments, from objects that sit on desktops to networks spanning the globe. To construct an environment is, of course, to anticipate and structure the user's interaction with it and in this sense to construct the user as well as the interface. When the simulated environment takes literary and narrative form, potent possibilities arise for reflexive loops that present the user with an imaginative fictional world while simultaneously engaging her with a range of sensory inputs that structure bodily interactions to reinforce, resist, or otherwise interact with the cognitive creation of the imagined world. The MINDBODY is engaged, not merely mind or body alone. Hence the force of material metaphors, for they control, direct, and amplify this traffic between the physical actions the work calls forth and structures, and the imaginative world the artifact creates with all its verbal, visual, acoustic, kinesthetic, and functional properties. [5]

The computer as a simulation engine suggested, then enabled, an environment in which the dimensions (scope, aspects) and spatial dimensions of language itself could be explored. To talk about writing in the 3<sup>rd</sup> dimension is to speculate about a possibility for which no symbolic system in use can serve as a comparison. Our writing systems—those in use and those for which examples have

survived—are inscribed in linear sequences (right-left or up-down straight lines, or the occasional circle or spiral) on essentially flat (or flattened for reading, as the Chinese scroll) two-dimensional surfaces (stone, bone, clay tablets, papyrus, paper, and the electronic “desktop”). The first Glide experiments were two-dimensional, with linearly drawn glyphs on flat surfaces. Immediately, the ease of moving the symbols around in a vector graphics program on a computer screen, in addition to the simplicity of the strokes that combined into glyphs led to a freedom that first stacked glyphs in vertical lines, but soon expanded their connections to the sides. Once links were formed, vertical, horizontal, and diagonal pathways were visible. The symmetry (and mirror-imaging) of the shapes lacks a bias for left/right or up/down, allowing the eye to flow with equal ease along all paths, once one has released the bias of alphabetic writings. These characteristics (multiple paths, linkings) invite the descriptive vocabulary of hypertext. Thinking about Glide as a hypertextual language, and finding parallels in hypertext theory has generated valuable insights, especially as to the nature and semantic possibilities of the link. Adding the time dimension to these spatially two-dimensional forms occurred when the gestural origin of Glide in the narrative context of The Maze Game, connected with years of work in the multi-sensory dimensions of the medium of the computer. Multimedia's developed vocabularies and techniques of morphing, ‘tweening, color-cycling, scaling, rotating, skewing, and zooming, used in animations, simulations, geometric and mathematical modeling and transformations, fractal generation, and wave-form production, made the move of morphing one sign into another, moving them across the screen, and dynamically changing their visual properties (scale, stroke width, color) a spontaneous gesture. Wondering about the *meaning* of this move—what does a transforming sign mean, and how did it achieve that meaning—unfolded in the writing of the novel, in working with my programmer collaborators in designing and building the interactive environments, in theoretical reading, and in using those environments in repeated cycles of writing and reading the shifting glyphs.

The move to the 3<sup>rd</sup> dimension involves a further departure from writing as we know it. In the LiveGlide interspace, the inscriptions of this three-dimensional writing are objects—three-dimensional forms inscribed in a three-dimensional world-space. Using a joystick, data-glove, or MIDI board shifts the physical action of writing to the gestural with greater degrees of freedom of movement. Movements of the hand are mapped to movement through the world-space and also controls meaning, in choice of glyphs and other visual properties. Freedom from the keyboard makes the abandonment of the alphabet explicit. The dance with the machine is more, or differently, sensual. The forms, once written, can be read. Reading is navigation, re-tracing the path of inscription, moving *around* the forms, or moving the forms *around*. One can place oneself inside or outside the

inscription (1<sup>st</sup> or 3<sup>rd</sup> person viewpoint). The visual qualities can be changed in the act of reading, which is akin to adding layers of interpretation, or different “readings.” Any reading, with its unique set of qualities, can also be saved, and “re-read.” Reading becomes explicitly performative; LiveGlide as a technology of inscription is an instrument to be played. The forms can appear on a gradient from invisible to completely opaque. They can, in the act of writing, double back on themselves, interpenetrating themselves in sinuous knots. This translucency and permeability of forms increases the perception of depth and multi-layeredness; LiveGlide explicitly transgresses the opaque whiteness of a page crossed by marching black figures. The starkness of black and white can be further transgressed by rippling color. The place of inscription is no longer a surface, but a volume; not a wall, but a world. In moving from two dimensions to three, LiveGlide leaves interface for interspace, the tunneling forms in search of further dimensions.

#### ENDNOTES

1. “Enabled,” glosses over the actual process; as anyone seriously engaged in the techno-mud-wrestling that it takes to learn complex programs, much less create one’s own specialized widgets can attest. In machine relations, as in love, power struggles are usually present.
2. As a teaser, The game Black and White, with which the P5 bend and sensor technology (brought to you by a company fittingly called Essential Reality) has been linked, places the player in the viewpoint not merely of macho dude with big bad guns to shoot but “sets players in the role of God, ruling over lands populated with villagers of potential worshippers. Players must first win the belief of villagers by impressing them with miracles and godly acts. Later, they will provide him with a personal pet; an emotional creature that has a life of its own, but wants more than anything to please its master. The player must rule as a benevolent or malevolent god. Whichever path he chooses affects his creature, his subjects and even the landscape of his kingdom.” [17] The hand of the player (encased in technology) is represented in the three-dimensional game world as the (humanoid) hand of God. Additionally, the hand’s visual representation changes from glowing to scaly, depending on whether you lean toward benevolent or malevolent godliness.
3. One more example of increased physicality and mobility in our machine/human relations can be seen in the current generation of arcade games where the players are using their full bodies in a dance on plates on the floor as their interface to the computer game. The beastie-boys and girls no longer slouch. They romp and stomp, dancing with the avatars on screen, proclaiming yet another possibility for transforming how we navigate through a narrative three-dimensional world.
4. I can post my eye-witness war reports directly to the WWW, even adding movies from a mini-cam on a keychain. The materiality of the medium makes all the

difference as to who can write, when, from where, and to whom. Control of information (by a government, for instance) is far more difficult when the communications (of phones and computers) have escaped the wired infrastructure. Peace protest actions mobilized by small, fast-moving and organizing groups connected by wireless communications are confounding police efforts to contain their agile civil disobedience.

5. Again, the variety of input devices goes beyond the keyboard-mouse-screen axis to the touch-screen, the PDA stylus, cell phone text messaging, and the tablet PC.

6. The movement is from work to play. “Hegirascope,” once the rhythms of dynamic changes are adjusted to, is a completely different experience than the first sense of an out-of-control wild ride. (That initial “out-of-control wild ride” is a feature, not a bug in light of the total experience of that work.) The wild ride also features in arcade games, and in online role playing games (RPGs) as one fights to stay alive while learning the rudiments of game-play.

7. The Phaistos disc, Linear A, the Easter Island script (Rongo-Rongo) and the Voynich manuscript are examples of yet-undeciphered scripts into which much effort has been toward translation.

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