Timelines provides perspectives on HCI history, glancing back at a road that sometimes took unexpected branches and turns. History is not a dry list of events; it is about points of view and differing interpretations.

Jonathan Grudin, Editor

Kai: How Media Affects Learning

Jonathan Grudin
Microsoft Research | jgrudin@microsoft.com

The following discussion occurred in the online Virtual Academy of Technology and Science. Kai and Randi, student and mentor, conversed as their avatars strolled through a lightly populated town.

Kai: I read a great review by Jim Holt of Nicholas Carr's book on how the Internet is trashing our brains [1].

Randi: I saw Carr's earlier article, "Is Google Making Us Stupid?" Does Holt agree?

Kai: Not at all! Holt presents Carr's arguments, followed by relevant experimental data. Carr's conclusions aren't supported. Quite the contrary, in fact.

Randi: The contrary? Holt says that the Internet is making us smart?

Kai: Well, he does conclude that it might make us less creative, but I didn't follow that argument. And Holt admits that technology has unanticipated consequences, reminding us that "Socrates, in *The Phaedrus*, warned that the innovation of writing would lead to the atrophy of human memory."

Randi: Did Holt say that, or did Carr?

Kai: Holt. Maybe it was also in Carr's book. Socrates's warning is well-known.

Randi: Yes, but the common view is not always correct. Have you read Plato's *Phaedrus*?

Kai: No.

Randi: Well then. Socrates—or Plato, really—had concerns about writing, but not about its effect on memory. And his thoughts are relevant today as we think about the effects of digital technology.

Kai: Is *Phaedrus* online? [*He gestures at a tower of virtual shops.*] Could we duck in there and pick up a copy?

Randi: There are translations online, but I have a real-world translation. Hold on while I grab it [2].

The avatars stop moving. As he waits, Kai observes that they have reached the edge of the commercial and residential district. Suddenly, Randi's avatar waves an arm.

Randi: I'm back.

The avatars resume their stroll, walking into a lightly wooded countryside.

Randi: Plato wrote *Phaedrus* about 30 years after Socrates died. So the dialogue between Socrates and Phaedrus, with no other witnesses, wasn't a transcript of a conversation; it was carefully constructed. Back then, the boundaries separating fact and fiction, or explanation and allegory, were fluid or nonexistent. In fact, the morphing of history into myth is a topic the two men discuss.

Plato founded the first educational academy in the western world. He was interested in finding new ways to communicate effectively. In *Phaedrus*, Plato weaves a dazzling shower of ideas and illustrations into a short, coherently structured account, laced with irony and dry humor that feel fresh today. Inspired by the real Socrates, Plato felt that ideas are provisional, open to challenge and refutation. He consistently promoted the dialectic method for acquiring understanding, but his writing is less consistent about specific knowledge. His view was that little is fully knowable.

Kai: Very well, but what does Plato say about writing?

Randi: In the dialogue, Socrates first anticipates Woody Allen's "I am at two with nature" by saying that he prefers to stay in the city, but that he is "like a hungry cow before whom a bough or a bunch of fruit is waved. For only hold up before me in like manner a book, and you may lead me all over Attica, or anywhere else." How negative is that?

Kai: It doesn't sound negative.

Randi: And then, when Phaedrus is about to summarize a speech he just heard a man named Lysias give, Socrates correctly surmises that the scroll half-hidden in Phaedrus's cloak is a copy of the speech. He asks Phaedrus to read it rather than rely on his memory, explaining "as long as Lysias himself is present," by which he means the scroll.

Kai: Really?

Randi: And later Socrates says, "It's not speaking or writing well that's shameful; what's shameful is to engage in either of them badly."

Kai: Okay, so if Socrates thought writing is cool, what's all this about writing eroding memory?

Randi: The main focus of the dialogue is not writing; it's about the costs, benefits, and meaning of love, and culminates in conjectures about the origin and meaning of life, consciousness, and our divided natures. Finally, though, Plato has the two men discuss theories of rhetoric, education, and the search for knowledge. Socrates reviews the skills of an accomplished orator. The final skill is the orator's need to understand listeners and grasp which specific rhetorical approaches will work with specific listeners. Plato, creator of the first academy, emphasizes that different strokes are needed for different folks.

Kai: Interesting, Randi, but what's the point?

Randi: When the two men have exhausted the topic, this exchange occurs:

Socrates: Well, then, that's enough about artfulness and artlessness in connection with speaking.

Phaedrus: Quite.

Socrates: What's left, then, is aptness and ineptness in connection with writing: What feature makes writing good, and what inept?

Kai: Finally we're getting to the argument about memory!

Randi: Yes, now Socrates launches into the often-cited story, albeit somewhat equivocally:

I can tell you what I have heard the ancients said, though they alone know the truth… In the Egyptian city of Naucritis, there was a famous old god, whose name was Theuth; the bird which is called the Ibis is sacred to him, and he was the inventor of many arts, such as arithmetic and calculation, geometry and astronomy, as well as the games of checkers and dice, and, above all else, writing.

Randi (continuing): Theuth described his inventions to Thamus, another god who was king of Egypt at the time. Thamus liked much of it, but when Theuth said that writing "will make Egyptians wiser and give them better memories and wit," Thamus replied,

O most ingenious Theuth, the parent or inventor of an art is not always the best judge of the utility or inutility of his own inventions to the users of them [3]*… This discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories… (Writing) is an aid not to memory, but to reminding, and you give your disciples not truth but the semblance of truth; they will be hearers of many things and will have learned nothing; they will appear to be omniscient and will generally know nothing; they will be tiresome company, having the show of wisdom without the reality.*

Kai: So all scholars who read many books are tiresome company?

Randi: Keep in mind Plato's provisional, inquisitive approach. Plato wrote books, including this one [4]. In this dialogue, Socrates says that it's better to speak directly to someone—or in his words, to "write in the soul of the listener"—but he also acknowledges that books can "store up reminders for himself when he reaches forgetful old age"; books can aid posterity—"everyone who would follow in his footsteps"; and books can preoccupy him when there are no souls to write on, "when others turn to different amusements, watering themselves with drinking parties and everything that goes with them."

Kai looks around. In the forest, between them and a nicely textured stream, butterflies rest on a deer that grazes a few yards from a seven-meters-long, three-meters-tall animated ad for a virtual tattoo parlor.

Kai: Drinking parties! Let's return to town and find a pub. But first tell me, were Socrates and Phaedrus uneasy about writing, or not?

Randi: Yes, but not because of its effect on memory. Listen to this:

Socrates: I cannot help feeling, Phaedrus, that writing is unfortunately like painting; for the creations of the painter stand there as if they are alive, and yet if you ask them a question they preserve a solemn silence. The same is true of written words. You would imagine that they had intelligence, but if you question anything that has been said because you want to learn more, they continue to signify just that very same thing forever. When it has been written down, a discourse roams about among those who may or may not understand it, and it doesn't know to whom it should speak and to whom it should not. And when it is faulted or attacked unfairly, it has no parent to protect it; it cannot protect or defend itself.

This is the heart of it, Kai. The art of rhetoric in education, Plato says, is for the instructor to understand a student and create a conversation on that basis, encouraging the student to question and answer. The conversation between old Socrates and young Phaedrus is a perfect example!

Kai: I see. A written text cannot be interrogated. It can't be reshaped for different readers, or defend itself against attack.

Randi: But Plato knew this was complex. Socrates says that Pericles was the greatest orator. But Pericles's famous speeches addressed the Athenian assembly; they weren't shaped for individuals. And Plato's book wasn't just written as a memory aid for himself. He brilliantly structured it to address the very weaknesses of writing that he identified. *Phaedrus* doesn't present only one view of the costs, benefits, and meaning of love; it presents three. The
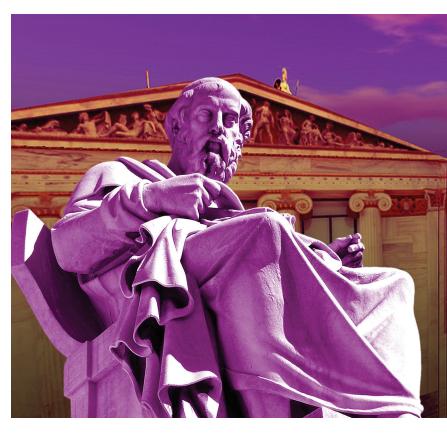
young man first reads Lysias's case. Although Lysias's speech was written down, it is subject to questioning and critique by Socrates, with Phaedrus there on its behalf. Then Socrates presents a stronger, though not inconsistent, argument. Then he expresses a change of heart, and launches into a longer, more elegant, and deeper analysis that reverses the argument in the first two treatments. Plato thus presents multiple views of the topic in the form of a dialogue with much questioning. This tour de force is structured to overcome the very weaknesses in writing that it enumerates [5]. And, of course, over the centuries educators have sought ways to engage students that transcend rote reading and memorization.

Kai: Interesting. It's also interesting that digital technology can address the weaknesses in writing that Plato or Socrates raised. Digital technology enables people to communicate with authors, interrogate texts, and engage in discussions with other readers. It enables authors to revise and easily create alternative versions of a text. And if the author is unavailable, other people can come to its defense.

Randi: Good point.

Kai: Who would have thought that ancient Greece would come up in a discussion of computing 2400 years later?

Randi: Ironically, *Phaedrus* questions the value of historical inquiry. Near the end, the focus shifts to the human condition: where our consciousness or souls came from, how to understand our often divided nature, and what might come after death. Plato often alluded to the blend of history and mythology of the time, supporting logical arguments with illustrative allegories. He wrestled with

conflicting versions of stories that had been reshaped as they were handed down, a process to which he was contributing by creating fictional dialogues based on the real Socrates, edging Socrates himself into a Greek pantheon of mythical figures and gods who may have had historical bases. But he expresses weariness with historical analysis. Let me read you one last passage.

Kai: Please do!

Randi: At the beginning of the dialogue, Phaedrus led Socrates to an idyllic river bank, a peaceful location for reading and discussing, and this exchange followed:

Phaedrus: Tell me, Socrates, isn't it from somewhere near this stretch of the Ilisus that people say Boreas carried off Orithuia?

Socrates: So they say.

Phaedrus: Couldn't this be the very

spot? The stream is lovely, pure and clear: just right for girls to be playing nearby.

Socrates: I believe that the spot is not exactly here, but two or three hundred yards downstream, where one crosses to get to the district of Agra. I think there is even an altar to Boreas there.
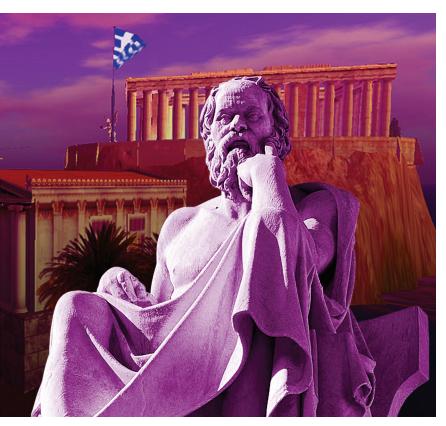
Phaedrus: I hadn't noticed it. But tell me, Socrates, in the name of Zeus, do you believe that that legend is true?

Socrates: The learned are doubtful, and I should not be singular if, like them, I too doubted. I might have a rational explanation that Orithuia was playing with Pharmacia, when a northern gust carried her over the neighboring rocks; and once she died that way, she was said to have been carried away by Boreas. Or was it, perhaps, from Areopagus? The story is also told that she was carried away from there instead. Now, Phaedrus, such explanations are amusing enough,

but he is not to be envied who has to invent them; much labor and ingenuity will be required of him; once he has begun, he must go on and give a rational account of Hippocentaurs and the Chimera; and a whole flood of Gorgons and Pegasuses and other monsters, in large numbers and absurd forms. Anyone sceptical about them, who wants to explain them away and make them plausible by means of some sort of rough ingenuity, will need a great deal of time. But I have no time for such things; shall I tell you why? I must first know myself, as the Delphian inscription orders; to be curious about that which is not my concern, while I am still in ignorance of my own self, would be ridiculous. And therefore I do not concern myself with them; the common opinion is enough for me. For, as I was saying, I look not into them, but into my own self.

Perhaps, Kai, we too should ask ourselves: Why exert labor and ingenuity to piece together a history of digital technology? Accounts of the same events differ, and much rough ingenuity is needed to fill in the gaps. Would it not be better instead to seek to know ourselves?

Kai: Perhaps we need not choose between those two options.

Randi: How so, Kai?

Kai: Digital technology is an endlessly malleable medium. Almost anything is possible. But not everything that we could build, do we build, and not everything that we do build, will we use. Human nature, behavioral and social, isn't so malleable. It evolved to its present form over millions of years. Our nature will constrain how we use technology. For example, through digital technology we can make

ever more of our activity visible to others; what will we choose to do? Our ancestors lived for millennia in close-knit groups with no privacy, and as technology encroaches on it, perhaps we'll discover we need less of it than we thought. Alternatively, we may work to find ways to preserve or increase it. Another example: Technology increasingly allows us to communicate rules, detect violations of rules, and even enforce compliance. Yet, as Dumbledore informed Harry, knowing when not to follow rules can be the key to success. Will we prefer the simplicity of enforcing rules uniformly, even at a cost in efficiency or effectiveness?

Randi: I see. Through attention to the many choices we make and the many paths we do not go down, we will come to know ourselves.

ENDNOTES:

1. The book is *The Shallows: How the Internet Is Changing the Way We Think, Read, and Remember.* The review is found at http://www.lrb.co.uk/v33/n05/jim-holt/smarter-happier-more-productive.

2. Translations of *Phaedrus* by Benjamin Jowett (1892) and Harold Fowler (1925) can be downloaded from multiple sites on the web. Quotations here are from a recent translation by Alexander Nehamus and Paul Woodruff in John M. Cooper (Ed.), *Plato: Complete Works,* Hackett Publishing, 1997, except in a few places where Jowett's style was appealing.

3. Thamus anticipated software development in formulating this advice.

4. Plato was dismissed and his work lost in Europe, where his student Aristotle was favored, but thankfully his work was admired and preserved in the Middle East.

5. Plato did, however, have ideas that he would not write down, apparently fearing that they would be unfairly criticized in his absence. Aristotle mentioned that Plato's "unwritten teaching" differed in particulars from his writings, but Aristotle was not specific, perhaps out of deference to his teacher.

ABOUT THE AUTHOR
Jonathan Grudin (http://research.microsoft.com/~jgrudin) is a principal researcher in the Adaptive Systems and Interaction group at Microsoft Research. Randi and Kai are fictional characters; any resemblance to living people hopefully won't be noticed.