acm forum

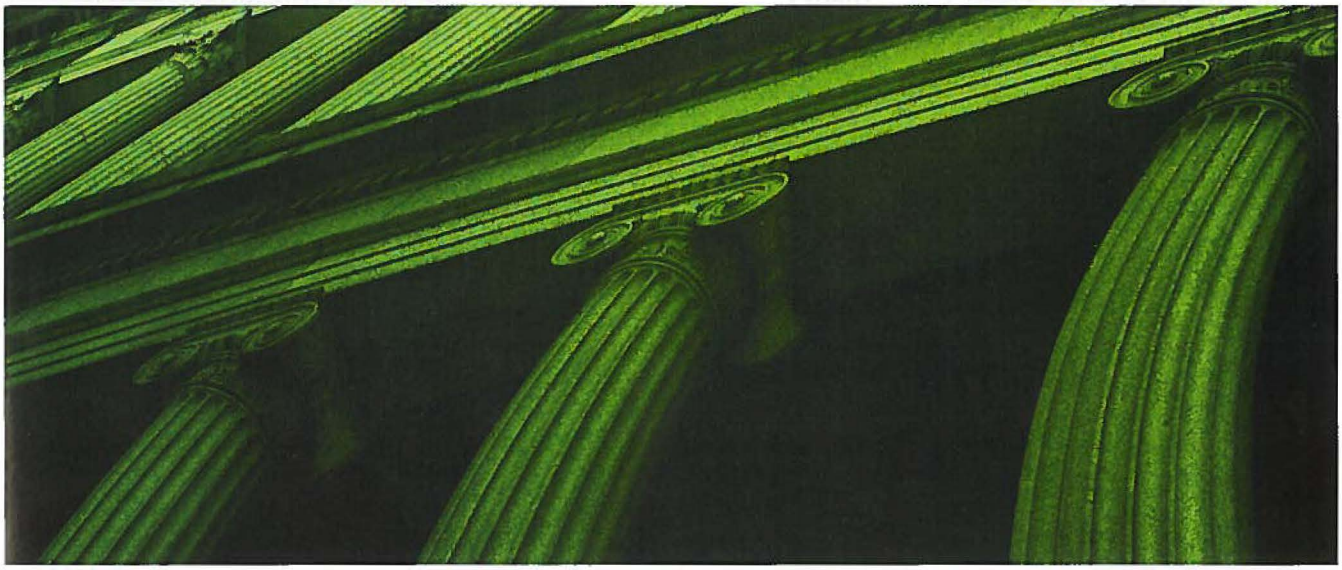

Photo illustration: Robert Vizzini

Battling Plagiarism

In his editorial ("Plagiarism in the Web," Dec. 1995, p.29), Peter Denning tells the story of Mr. X, who plagiarized scholarly articles by collecting them via ftp and publishing them as his own. The presence of digital libraries and new software developed to automatically control for plagiarism are tools to help sift through already published material to detect and prove plagiarism.

I would like to recount an incident that shows the value of computer technology in battling plagiarism in a much smaller, but probably more common setting.

Two years ago, two colleagues and I taught an introductory IS class in the night school of a well-known university. A number of the students did not take the class because they were interested in the subject, but because the class was classified as "science" and therefore provided a relatively easy way to collect the necessary science credits for a post-graduate degree.

A term paper about uses of information technology was part of the requirements for the class. When the students turned them in, our suspicion was aroused, since both the language and technical content of some the papers was considerably above what what the students had previously produced.

We singled out about 10 papers for investigation (out of a total of about 40), and checked them against databases such as ABI/Inform and Lexis/Nexis. The result proved our suspicions for some of the students; their papers, along with printouts from the databases, was turned over to the Academic Disciplinary committee. Six students were expelled. The school, to its credit, did not try to sweep the issue under the rug. At the beginning of the next semester, new students were required to sign a paper that they had read and understood the school's policy on plagiarism.

We made some observations from the incident:

- Checking for plagiarism through use of online databases was easy and efficient. It took about eight hours in total to check the papers and document the plagiarism.
- Lexis/Nexis proved to be particularly useful for proving plagiarism, since the database contains many articles in full text form, and the software

allowed searching for full sentences. Thus, we could take a particularly cleverly worded string of buzzwords and instantly find the article it was lifted from.

- Cases where the students were expelled were clear-cut; the students had sent in whole articles, or the whole paper consisted of unattributed quotes. There were some borderline cases, where students had copied paragraphs from an article or unattributed summaries from ABI/Inform. Overall, we chose to err on the side of caution, being lenient in what we considered to be plagiarism.
- Even though use of online databases was a significant part of the course, it did not seem to occur to the students that copying from the databases or published literature could be traced.
- Lack of language ability seemed to be a strong motivator for plagiarism: Most of the expelled students had English as a second language.
- Students were generally aware they were doing something wrong, but did not think it would have consequences. We got the impression that this kind of behavior was relatively common, but that most teachers lack means to effectively check for plagiarism.
- There were some lighter moments: One student tried to defend himself saying that where he came from (a foreign country) this form of plagiarism was common and accepted. A telephone to that country's Embassy produced an educational representative who in unequivocal terms informed the student that such was not the case.

Lastly, though detecting and proving plagiarism is considerably easier with electronic databases, the human issues are as unpleasant as ever. Getting expelled from the school was a considerable embarrassment for the students, and economically disadvantageous for some of them. Although my colleagues and I are glad we went through with the case, we do not remember that particular course with pleasure.

Espen Andersen
Arlington, MA

Thanks

While looking forward to each new issue of *Communications*, I must admit to putting more than a few of them aside over the years with the belief that I wasn't able to grasp what I had just read, nor could I imagine an application in my work area. Yet, over the last few years I've noticed I am increasingly finding more to read that is of interest to me in each issue. I particularly commend you on including the article, "Using Design Patterns to Develop Reusable Object-Oriented Communication Software," by Douglas Schmidt (Oct. 1995, p. 65).

I thought Schmidt's article was well written, very clear, and very interesting. I found his ability to pack incredible vocabulary and meaning into complete, coherent sentences to be at once amazing and fun to read. Also, the work is quite current, both in terms of Object-Oriented Analysis and Design concepts as well as the newer area of Design Patterns, and I very much enjoyed the discussion on REACTOR and the issues of using it on different platforms. I'd like to see more articles like this in future issues of *Communications*.

Keep up the good work!

Garrett Hildebrand
Irvine, CA

Meet the Participant-User

In her introduction to "Representations of Work" (Sept. 1995, p. 33), Lucy Suchman hesitates in her invocation of anthropological methods in HCI; she suggests Morten Kyng's "emphasis on end-user cooperation in system design will likely strike many readers as an unrealistically stringent requirement . . ." To the contrary, I was struck in reading these articles by how much further we need to go in involving users in the development of human-computer interfaces.

Anthropologists and ethnomusicologists in recent years have worked as participant-observers, participating in the day-to-day activities of a culture so that they may know it from the inside. In developing the emerging field of Interface Studies, I seek to *engage the participant-user*. We can meet the users in life and empower them with extensible interfaces. As the role of computers in society has expanded, we can extend our view from representations of work to include representations of play and other rituals. By opening our perspective, we can create more deeply satisfying interactions among humans and machines.

Andruid Kerne
New York, NY

Digital Village

It has been many years since I have been actively involved with ACM, although I have remained a regular reader of ACM's publications. I became a member in 1958, and was the founder of SIGOPS, primarily because of my interest in online time sharing. Since 1975, I became active in the world of voice communications, primarily in the areas of voice messaging and automated call processing. Hal Berghel's excellent initial "Digital Village" column ("Maiden Voyage," Nov. 1995, p. 25) has stimulated my interest.

What I found missing from the article were explicit references to the potentials and issues for enterprise "digital commerce" in the Digital Village, as opposed to interpersonal social intercourse and information retrieval. Within that context, "non-real time" and

multimedia communications will have dramatic implications for the consumer public that is the subject of great speculation in the world of business. Changes are starting to take place on the World-Wide Web in how advertising, sales promotions, and customer support are implemented over the network, and how caller assistance can be effectively provided by enterprise call centers to "multimedia callers" (as opposed to traditional telephone voice callers), for real-time conversations, messaging, and callback modes.

I look forward to future articles on the Digital Village and would be interested in contributing to the concepts and issues associated with the points mentioned.

Arthur M. Rosenberg
Santa Monica, CA

Digital Village looks like it will be a very useful addition to an already excellent publication. The village analogy is a comfortable one and makes great sense within the context of the article. Having said that I think Hal Berghel approach is symptomatic of a general cyber-related malaise that may actually be a barrier to understanding and maybe the evolution of all the multivariant stuff we lump under cyberspace. Yes, there is definitely a sense of community, a "culture" and many compartmentalized sets of commonality amongst the inhabitants or users of cyberspace.

But it is not a village. It has no physical dimension to speak of and it has not a lot more than disembodied largely text-based communication. Sure we've got lots of images and sounds on the Web, but suggesting that constitutes a village is like saying TV is the real world.

The point is that this great and wonderful cyberspace is cyberspace. It's new, it's different, and it needs new approaches for us to really begin to understand what it is as a human phenomena. Treating it as an analogue of the idealized village while comfortable and reflective of cyberspace's best characteristics is limiting and just plain incorrect. We don't need a new paradigm to understand and embrace it; it is the new paradigm.

Hope that's helpful. I wholeheartedly agree with Hal's optimistic and positive view on the potential for cyberspace.

Toby Eduardo Redshaw
Hong Kong

Issue on Ethics

Computer science professionals are trained to use precise definitions, careful consideration of all possible foreseeable results, and quantifiable estimates of outcomes. It's hard for us to take "Ethics" seriously if we see it presented using poorly defined and emotional words, argument by analogy, and consideration only of the few intended, rather than the many actual consequences. These modes of discussion may be useful for lawyers as combatants, or for lawyers and judges trying to implement an ambiguous legislative design, but they are inadequate tools for someone making design decisions.

The articles on Ethics and Computer Use appeared to leave out, (but CS course content on ethics should certainly include): a) 20th century philosophers' work carefully defining just what information is carried by the use of words like "rights" and "responsibilities"; b) evolutionary observation that the most important consequences of an act are those that feed back to affect the probability of future similar acts; c) the engineering view that undesirable functioning of a system is most productively addressed by finding and changing that which will give good results with minimally difficult changes, rather than by assigning "blame" or four different kinds of responsibility; and d) the experimental view that if you have only a poor idea of the likely consequences of a decision, it may be positively worthwhile to implement different versions to find out how well different approaches work in practice.

Thomas W. Moran
Saratoga, CA

Iridium Project

As a veteran member of ACM who also teaches forecasting, I started reading the Technical Opinion by Wang and Kettinger (Oct. 1995, pp. 119-122) with some interest.

My immediate concerns are the following:

- The "actual" data in Figures 2 and 3 appears to be given for years that are still in the future.
- The origin of the "time" variable is not given. By putting the stated formula and parameter values into a spreadsheet, I found that "time" appears to be "calendar-year 1974," so that 1985 gets a time value of 11. This gives the stated forecast values for subscribers in 2015 and cells in 2020.
- The difficulty in obtaining convergence of SAS PROC NLIN to parameter estimates is suggestive that the formulation of the forecasting model is badly scaled. I have authored two books in which many pages are devoted to such troublesome matters.
- There are no measures of variability given for either the parameter estimates or, more worrying, the forecasts themselves.

There are other S-curve functions that could have been tried here. A general issue in forecasting is the difficulty of selecting an appropriate model form from a family of likely candidates. I urge my students to try several—if they generally give similar forecasts, then at least we have not been victims of some peculiarity of a particular form. Of course, a better approach is more profound

analysis and the construction of models based on understanding of the phenomena of interest.

John C. Nash
Ottawa, Ontario

Wang and Kettinger made two mistakes regarding the use of satellites for cellular communications.

The first is with regards to geosynchronous satellite orbits. A geosynchronous orbit is not the same thing as a geostationary orbit. Geostationary orbits are 22,300 miles above the equator, and the satellite appears to remain in the exact same place at all times. Geosynchronous orbits exist at multiple altitudes, and only require that the satellite be at the same place at the same time everyday. The Iridium Project cannot use geostationary orbits due to coverage and time-lag problems that cannot be avoided.

The second is in regards to frequency use. A nearly vertical pathway between transmitter and receiver allows for a large amount of reuse of the electromagnetic spectrum through the use of a directional antenna. This option is not available to current cellular systems, since the cell tower responsible for any particular location can be in any direction along the horizon, forming a ring around the user.

John L. Edwards
Annapolis, MD

Wang and Kettinger state ". . . Motorola's Iridium project plans to launch 66 geosynchronous satellites to cover the globe. There are two major drawbacks of the satellite approach.

First, the sky is crowded. A satellite needs to be in orbit 22,300 miles above the equator to rotate geosynchronously with the Earth.

Well, as far as I know, the Iridium project plans to launch its 66 satellites into Low Earth Orbit (LEO) which is from 400 to 600 statute miles in altitude and has never had any plans to use a geosynchronous orbit. If they did use a geosynchronous orbit, they certainly would not need 66 (down from 77 initially) satellites but your cellular phone certainly would need a hell of a battery.

Emmet C. Quill
Rapid City, SD

Wang and Kettinger introduced the Iridium project as using geosynchronous satellites, which is not correct.

The goal of Iridium project is providing a uniform wireless services regardless of a user's location, especially in the sparsely populated areas where the cellular services are not accessible from a subscriber's hand-held telephone.

In such a case, the subscriber will be connected to a closest satellite among the 66 low-orbit satellites at an altitude of 780 kilometers (420 nautical miles), then the call may be transferred to other satellites until it is passed to a gateway station on Earth [1]. Those 66 lightweight satellites will be in the six orbital planes of 11 satellites each, building a sky-based cellular network, not land-based [1, 2].

The authors' first point that the sky is crowded is not yet true for this kind of low-orbit satellite, since there are still some space allowance. For example, Microsoft is planning to launch 800 satellites to construct its own network.

There are some reasons that geosynchronous satellites are inappropriate for this kind of personal communication. One is that, as the authors pointed out, the strict limitation of the number of seats in the geosynchronous orbit does not allow cramming that large number of satellites.

And the users would have to carry quite a big transceiver unit with a high-power supply, the best one will have to be at least the size of a briefcase. Also, the round-trip delay time is about 50 times longer than with low-orbit satellites.

References

1. Nellist, J.G. *Understanding Telecommunications and Lightweight Systems.* IEEE Press, p. 127.
2. Rymer, J.R. How distributed objects will manage a network in space. *Distrib. Comput. Monitor,* (Apr. 1995), 31.

Yoohwan Kim
Cleveland, OH

Response

We are glad to see our article has attracted so much interest, and look forward to correcting any misunderstandings or inadequacies. The following responses address Mr. Nash's concerns:

- Were we projecting based on future data?

No. It appears that somewhere during the publication production process of this manuscript, the two diagrams were rescaled to fit the page and in doing so, altered the diagrams to make it appear we were using data from the future. However, as was clearly stated in the article, the data used was for the period of December 1984 to June 1994.

- Was there a convergence problem?

No, not according to the SAS output. The statistical results of our SAS output states: "Convergence criterion met." Thus, there was no difficulty in convergence of the three parameters; parameters were not badly scaled. We recognize that improper initial values could lead to parameters failing to converge, but this was not the case in our study.

- Should additional forecasting models be tested?

(Continued on page 18)

Ideally, yes. We understand there are many forecasting methods and that the logistic model used in this study is just one of many. We also understand the importance of trying other methods as Nash has indicated. However, as the objective of this study stated, we limited the scope of our research to extending Gurbaxani's BITNET growth projections to the growth of the cellular industry (*Communications*, Dec. 1990, pp. 65–75). Therefore, we use the exact same S-shaped logistic modeling method employed by Gurbaxani to empirically examine and forecast future cellular growth. This studies use of the S-shaped logistic model provides a valuable starting point in forecasting this industry's growth. We encourage others to employ alternative models in future research to test our results and extend this work. We also plan to follow this line of inquiry.

In regard to Kim, Quill, and Edwards' comments, Motorola's Iridium project goal is indeed to launch 66 satellites in the low earth orbit, not the geosynchronous orbit as indicated in the article. A misinterpretation of reference material led to this incorrect statement. We appreciate the corrections made by those who caught this point. However, while this misstatement needs to be corrected, the reference to the Iridium project was only an ancillary example and in no way should be viewed as distracting from the objective of the article which is to predict the growth of cellular communications by applying a logistic model to growth in cellular technology usage. While not significant to our findings, we regret the mistake and appreciate the opportunity to clarify it. As to Edwards second point concerning frequency reuse: as the articles states in that section, we were discussing "the future of cellular technologies" (p. 121). We did not contend that microcell technology was available on a wide-spread basis at this time. ◻

S. Michael Wang and Bill Kettinger
Columbia, SC