

speakout

Why must computers make us feel blue, see red, turn white, and black out?

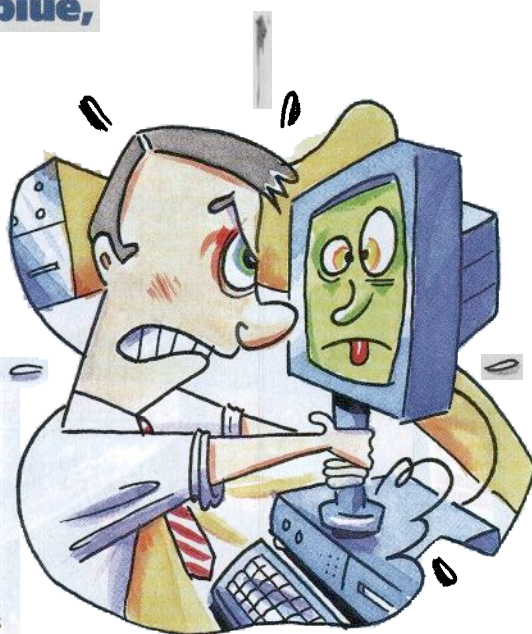
EDMUND RONALD
& MOSHE SIPPER

Why do we sometimes feel the urge to throw our computer out the window? Because we are human and we feel. We don't (always) think or reason. Rather, when that demon in the machine really acts up, we may simply feel a compelling urge to throw the box-plus-demon out the window, and be done with it.

Humans and computers are two alien races that often fail to communicate smoothly (or at all), despite one race having created the other. In their wisdom, computing professionals have not failed to note this alienation problem. Entire fields—such as software engineering and computer-human interaction—have sprung up over the years to amelio-

rate this unfortunate alienation. To make clear that this is a serious business, our fellow professionals coined the term "user," just as doctors refer to those to whom they minister as "patients." However, if they ignore the feelings of their supplicants, both doctors and computer designers may be failing to take seriously enough their respective workplace oaths.

Over the past decades, as computers have moved from clean rooms to messy offices (and even messier living rooms), there has been a growing insistence on user-friendliness. Ah, what a euphemism for oftentimes surly, unfeeling behavior. How would you feel if a close friend



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Scope:

The purpose of this bi-annual symposium, following in the footsteps of seven previous ones, is to promote research activities in various areas of manufacturing systems automation by providing a forum for the exchange of ideas, presentation of technological achievements, and discussion of future directions.

The topics of interest include, but are not limited to: mechatronics, robotics, autonomously guided vehicles, sensing and signal processing, manufacturing process control, planning and scheduling for manufacturing, flexible manufacturing systems, principles of agility in manufacturing, communication networks and software systems, reliability, reconfigurable manufacturing systems, malfunction analysis, concurrent engineering, evolutionary computation, and advanced computer integrated manufacturing.

Paper Submission:

All papers should be written in English. Both long and short papers will be considered. A long paper is defined as less than 6-8 proceedings pages and a short paper is less than 4 pages (about 1000 words per page). Long papers are reviewed as full manuscripts including abstract and keywords. Short papers are screened by a 600-1000 words summary with keywords. Papers should be submitted to the Co-chairs of the Program Committee: Professor Steven Y. Liang, G. W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0405, USA, Phone: 1-404-894-8164, Fax: 1-404-894-9342, e-mail: steven.liang@mc.gatech.edu, or Professor Tatsuo Arai, Department of Systems and Human Science, Graduate School of Engineering Science, Osaka University, Machikaneyama, 1-3, Toyonaka, Osaka 560-8531, JAPAN, phone: 81-6-6850-6365, Fax: 81-6-6850-6341, justas_pc@arai-lab.sys.es.osaka-u.ac.jp.

Deadline for paper submission: November 30, 1999

Paper acceptance notification: February 15, 2000

Camera-ready manuscript due date: March 15, 2000

The Program Committee also solicits proposals for invited paper sessions, panel sessions, and tutorial sessions. These proposals should be submitted by October 1, 1999 to the Program Co-Chairs.

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replied in a loud voice, "Core Dumped," when you, say, asked her out to a movie? But that is often the perceived response when a user, quietly performing a task, asks something of the computer that the machine takes to be inappropriate. The clinical term "user" evokes an image of a dispassionate, rational being—a Mr. Spock who is never offended, upset, or peeved when the computer does not behave as it should.

But when Captain Kirk converses with Computer, his emotions do come into play. Surely, any truly human user will display irritation, frustration, fear, and anger when confronted with a recalcitrant machine. So let us boldly go where no system designer has gone before and investigate these feelings. And above all, remember—it is *perfectly all right to have them*.

Irritation. We all have our pet peeves. Why must I go through seven voice menus when calling up the automated flight-information service, just to end up hearing a laconic "Error, please start over" message? Why does the automatic teller machine take so long to dispense the stupendous sum of \$40? Why has it taken

me three years to discover that I can save a file at a keystroke, without going through four menus?

We often find ourselves irritated by minor details of this kind, which evoke in us the WWW feeling: Why?! Why?! Why?! Why has no one cared enough to address these irritants and fix them?

"This world is a comedy to those that think, a tragedy to those that feel."

Horace Walpole,
wit and novelist, 1717-97

Frustration. In an article on hardware design, Maurice Wilkes of Cambridge University, England, an early pioneer in computer design who developed the Electronic Delay Storage Automatic Computer, or Edsac, in 1946, wrote:

"Hammers and saws are tools that can be taken for granted. Everybody knows what their capabilities are as well as their limitations. The user can have confidence that, if properly used, they will not break. Few software tools are as robust as a hammer or a saw, or even an electric drill."

We agree: computers are neither hammer, nor saw, nor electric drill, though these are sometimes the tools we wish to use on them. User frustration has become an unavoidable aspect of computerization. The discovery of a psychological fatigue analogous to carpal tunnel syndrome may be just around the corner.

Cosmetic changes by means of user interface design will not make fundamental hardware and software inadequacies disappear. Why must we type with a keyboard that is a relic of the days of the typewriter and therefore unfit for human hands? Who in his right mind can expect the mouse to be a jack-of-all-trades drawing device, allowing us to draw, cut, and paste, with the naturalness of paper, pencil, and scissors? Why are some typesetting software packages (such as LaTeX) unwilling to accept the user's wish to place her figure exactly *there*?

As human users, we usually possess an intuitive, natural way of executing a desired operation; unfortunately, the software and hardware at hand often force us to act in twisted, unnatural ways. The user's will is more often than not the computer's won't.

Fear. Many people are afraid of flying, and with just cause—after all, airplanes

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from time to time do crash. Well, so do computers, and they do it more often. And we hold that *collapsophobia*—"fear of imminent computer crash"—is always in the back of our (user) minds.

There are at least two levels to this syndrome: *accidentophobia* and *catastrophophobia*. Accidentophobia is the anxious feeling one has when working with "delicate" software that often decides to take a nap when you're going through the most creative five minutes of your life. Some programs and operating systems are known to crash gloriously, and with them you often find yourself working on the edge, gingerly stroking the keyboard, while continually expecting (thanks to past experience) a nasty rendezvous with the tarmac.

Catastrophophobia is the sum of all accidentophobias—it is the ever-present feeling that with one unfortunate key-stroke you will wreak havoc upon a lifetime of work. Are we dealing with user-friendly or user-hostile? Friendship is about trust and confidence, whereas we dare any reader to come forth and proclaim her complete and utter confidence in her boxy amigo.

Anger. How many times, after a trying period of sweat and anxiety in front of your computer, have you sought a close encounter with the creator of that torture machine, and evoked images of various medieval torture devices of a very specific nature? Computers do not (yet) program themselves, nor do they self-construct (though somehow they manage quite nicely to single-handedly de-program and self-destruct). There are humans behind the scenes, known as software designers and hardware engineers. Oftentimes, we find ourselves foaming, with our froth directed at this faceless mob.

Or, this mob does have a face: of your boss (or her boss, or his boss, or her boss, ad infinitum). Organizations tend to force unwanted software upon their employees, in which we have no say at all—we are mere users! Coerced by system designers and by the bosses to do the unnatural, how can the user not end up being angry? And irritated, frustrated, and fearful. Before you know it, you're screaming at the top of your lungs: "I HATE COMPUTERS!"

Surely, all kidding aside, the issues presented here merit attention by computing professionals—after all, why not hold the industry responsible for its handiwork?

There is a breath of fresh air, though. It comes from the games industry: people actually like game computers. Why? The people in question are usually not adults but kids and teenagers. And they are the toughest clients to cater to—if they don't

like a game, they simply trash it. Certainly they won't buy a more advanced version.

Games, at their most fundamental, provoke emotions; good games provoke positive emotions, such as exhilaration, triumph, contentment, and success. The games industry is well aware of this and works arduously to produce the friendliest software and the niftiest hardware.

But for the mainstream computer user, what are essentially easily corrected peeves persist because packaged software has distanced the user from the producer, rendering minor customization cumbersome. What's more, frustration is heightened by the monopolistic standardization of a small collection of obsolescing packages, which leave no space for new user-interface requests, and which the user is forced to employ even when more adequate tools exist.

As for fear, products inducing accidentophobia or even catastrophophobia are simply inexcusable. Systems crash often, and sometimes stay permanently grounded, leaving their users to cry in vain. Can we not expect computers to take off with the same ease and grace with which they crash? Software companies maintaining the products of the day have tremendous inertia. Their patronizing attitude, financially rewarding though it is, ultimately stokes discontent. Faced with a de facto monopoly of hardware and software, the user ends up with a rainbow of feelings. But fear not, dear user, and take comfort in the words of the famous 1939 song:

"Somewhere over the rainbow
Way up high,
There's a land that I heard of
Once in a lullaby."

And how does one get to this promised land? Well, perhaps we should follow Thomas Jefferson's advice, given in a 1787 letter: "A little rebellion now and then is a good thing." ♦

Edmund Ronald is an affiliate researcher at the Center for Applied Mathematics of the Ecole Polytechnique, in Paris. His interests include the philosophical underpinnings of artificial life and communication in collective robotics.

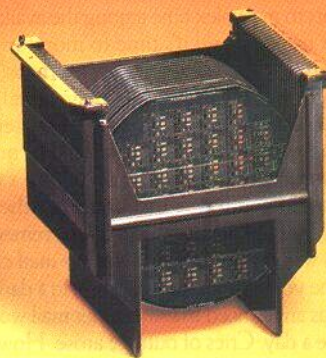
Moshe Sipper is a senior researcher at the Swiss Federal Institute of Technology in Lausanne, Switzerland. He is the author of *Evolution of Parallel Cellular Machines: The Cellular Programming Approach* (Springer-Verlag, Heidelberg, 1997), and close to 70 scientific articles concerning adaptive computing and bio-inspired systems.

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