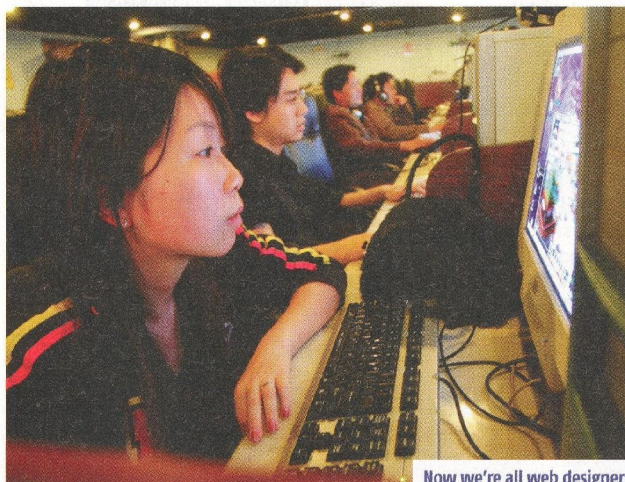


Sites that grow to look the way you like...

SITES that evolve as if they were living organisms are making their way onto the internet.

This ability to adapt without human intervention allows sites to stay up to date with changes in their users' tastes and can result in designs that are more user-friendly than anything a human designer is likely to come up with. Evolving sites might also allow web designers to home in on the features that work best for users.

Evolutionary algorithms are already helping engineers to design super-efficient aircraft wings and boat hulls by selecting the best features of "parent" designs (*New Scientist*, 28 July 2007, p 26). Now Matthew Hockenberry of Creative Synthesis, a non-profit organisation in Boston, Massachusetts, has adapted the technique to develop evolutionary



software that alters characteristics of web pages, such as their colours, fonts and hyperlinks.

He took a blogging template from the Wordpress site and added software that varies these traits, according to what seems to grab people's attention as revealed by where users position their cursor. Hockenberry used mouse-tracking software developed by Ernesto Arroyo of the Massachusetts Institute of Technology, to monitor and record the cursor's position.

He then asked 24 people to use

his template to create blogs. The bloggers were free to set up the design of their blogs as they liked, but once the blog went live, control of the design was out of their hands.

The software treated each feature as an organism vying for attention. It randomly mutated some features of the page when it was refreshed. After evaluating what seemed to work, it killed the traits associated with lower-scoring features and replaced them with those from higher-scoring ones. For example, if a

link in the Arial font kept being ignored, the software would switch it to, say, Helvetica, if links in that font were getting more attention.

The initial designs can be tough to look at. "We see a lot of terrible designs for the first 100 or so generations," Hockenberry admits. But the pages gradually morph to meet the consensus of users' preferences.

Gregg Vanderheiden of the University of Wisconsin-Madison, says sites that cater to people with disabilities would benefit from evolving pages. "If visually impaired people used this, it could evolve to display fonts larger than the designer had intended," he says.

Evolutionary computing researcher Charles Ofria of Michigan State University in East Lansing says the idea might remove the need to constantly test websites on users in the way that companies like Amazon, Google and Facebook now do. "With the computer doing the evolving, it can be continuously changing," he says.

So far, the software evolves sites according to a consensus of viewers' taste, but Hockenberry says it could be possible in future for sites to tailor themselves for individual users. **Michael Reilly** ●