

Where are the women in open source?

IMAGE COURTESY: JAMES DUNCAN DAVIDSON/OREILLY MEDIA

Are sexist attitudes turning women away from Linux? **Rebecca Smalley** investigates.

"If we can't even figure out how to bring women into computer science, how are we ever going to get ethnic minorities and the physically challenged more involved?"
Barton Massey, assistant professor, Portland State University

"Whether it's biological, social or a mix of both, why try to fix something that isn't broken? This urge to 'social engineer' your fellow citizens into being more what you want them to be is what needs to be fixed, if you ask me."
Arker, posting on LWN.net

Open source is a good news story, an example of how software can be free, collaboration can be innovative and computers can benefit society. Office politics and corporate glass ceilings are marginal, and your race, religion and gender can be invisible and irrelevant. To quote Al Yankovic, it's all about the Pentiums.

And how liberating that is for programmers! "In a distributed, collaborative environment, it's the work and the quality of the code that matters," says Jim Jagielski, core developer and secretary of the Apache Software Foundation. "The ASF is a true meritocracy." Thanks to the internet, everyone is free to tinker the hood, help fix bugs or submit code and

ideas. The best rise to the top, but even novices can feel involved. Several women have come to prominence: Allison Randal, ex-president of the Perl project, Danese Cooper of Intel and the Open Source Initiative, Mitchell Baker, president of the Mozilla Corporation, and more. Linux project leaders say a contributor's gender isn't an issue; often, they're not even aware of it. "I know some women who are mistaken for men and the other way around based on their first names. I'll gladly take changes from anyone," says Greg Kroah-Hartman, full-time hacker of Linux kernel.

Yes, open source is a wonderful world. But at heart, it's a man's world.

The other half

The proportion of women either working in or studying IT in the UK and US is estimated to be between 8% and 20%. Less than 10% of software developers at Microsoft are women – this is pretty dire, but the situation in open source is far worse.

FLOSS surveys carried out in Asia, Europe and the USA in 2002, 2003 and 2004 suggest less than 2% of people active in the community (as opposed to desktop Linux users) are

female. In a presentation given on women in Debian this July, Magni Onsoien and Erinn Clark reported that women accounted for just 4% of people posting on Gnome mailing lists, 1% on Gentoo mailing lists and 0.82% on the Debian-devel list.

Projects are overwhelmingly male creations. "We've only had two women fully engaged in the PHP project, only one of whom was actively contributing code," says Andi Gutmans, co-architect of PHP. In *Apache* there are "a handful"

aren't contributing equally with men.

It's not as if people are calling for more pink desktop themes, that's for sure, though Theresa Brennan, director of OS engineering at Linspire, comes close. "I think you would see more collaborative and educational software as well as different UI designs and more games targeted for women," she says. "More diversification of open source developers would enable open source to meet the needs of both male and female users."

"WE'VE ONLY HAD TWO WOMEN FULLY ENGAGED IN PHP" ANDI GUTMANS

of women, says Jagielski; in *Samba*, it's "zero, I'm afraid", says Jeremy Allison.

Ask people if it matters that women are so invisible in open source, and the answer is almost always an emphatic yes. Ask why it matters, and people struggle to express their gut feeling in pragmatic arguments. Many contributors don't have a clear idea of how open source would be different with more women on board, they simply feel it isn't right that women

Mostly, the motivation to get more women involved is moral and indignant. In the words of Debian contributor Fernanda Weiden: "We have a community of volunteers teaching the world how to develop technology in a different way, and at the same time a community in which women – more than 50% of the total world population – don't participate."

Still, there are pragmatic arguments, not least that with so few women

participating, there is simply a smaller pool of people to help power the open source movement and make up the ICT workforce. A report published earlier this year, for example, predicted that the target of 3% of EU GDP being generated by R&D can't be reached without more women scientists. "Certainly we're always short of contributors," says Allison Randal, "and doubling the number of potential contributors would be a good thing."

Natural selection

So what's going on? Where are the women?

Well, plenty of people will tell you where the women are: women have children to look after. Women have the washing up to do. Women have got a life. Women don't like tinkering with software. Women are better at managing or multi-tasking than staying up all night coding...

And these people aren't all men. Even female academics and hackers will tell you at least part of the problem is about the differences between men and women. Danese Cooper says she has plenty of anecdotal evidence, much of it gathered at the recent Women In Open Source debates she has been involved in at OSCon conventions, that the lives some women lead keep them out of Linux. "More than one of the panellists has admitted that their non-traditional family, with a partner doing most of the 'mommy duty,' had undoubtedly supported their open source involvement," she says.

OK, but in an environment shaped by these truisms, it's easy to become comfortable with women in managerial or administrative roles but not in core development. It's accepted that few women code, because as a male user wrote on Groklaw (sensibly beginning his post with "I am not setting this up as flame bait") recently: "I am tenacious at working on a problem with exclusion of all else. My wife can and does manage several tasks with less tenacity."

And from there, it's a short step to generalisations and stalemate. "This whole tired idea is blindly oblivious to the fact that by nature, men and women are different, and there is nothing wrong with that particular reality," wrote one LWN.net forum member. "Why draw up the battles lines when there is nothing to fight

about?" Why? Well, because of people like Fedora enthusiast (and informatics PhD student) Mary Ellen Foster. "It's probably only been in the last few years that I've got more interested in the behind-the-scenes aspect of thing," she tells LXF. "I finally realised that, instead of just moaning about it when things don't do what I want or expect, I could actually help to fix them."

These are the kind of women who need to be welcomed into the community – they've got the bug, and we want them to keep it.

Bully boys

"I do get a lot of assumptions. When I'm online my handle, linuxgirlie, is pretty obvious, but I still get the odd remarks about 'Are you sure?', or even sometimes 'That must be a chatbot'."
Jo Harris, Karoshi co-founder

Some more assumptions: Linux hackers = male geeks. Male geeks = single. Single male geeks = immature around women. Therefore, the theory goes, the reason why women are put off FOSS is that they're constantly being sniggered at or chatted up at conventions and user group meetings by lonely nerds whose most recent, meaningful female encounter was being served by a girl in KFC.

Not so. Face-to-face open source gatherings are on the whole polite and friendly affairs. "I get to Portland LUG meetings once in a great while and regularly attend meetings of the Portland area Linux kernel developers," says Barton Massey, assistant professor in computer science, Portland State University. "I am pleased to say that in the meetings of all these organisations I've been involved with, the tone has been almost entirely gender-neutral and professional. Some of the nastiest, most misogynistic behaviour I've seen has actually been anonymised trolling and slurs in online forums."

Most open source users and developers turn to online mailing lists to post questions and ideas. As we've seen, they provide a relatively anonymous, gender-neutral environment – but the flipside is that people feel free to be more combative, intimidating and sexist than they would be face to face. Flaming, trolls and sleazy jokes are all still common, and a true turn-off to women.

Karine Delvare, a member of the Gimp development team, explains how

easy it is for a woman to turn away from online communities. "I wandered for a while in the #gnome-fr channel," she recalls. "I don't any more, partly because of gender issues. In short: they talked too much about my gender. Not in an offensive way; they were happy to see a woman, but they just couldn't stop talking about that. They never asked about my contributions or technical interests." Delvare is now a happy member of the Gimp IRC channel, where she feels like just another contributor.

The female-unfriendly nature of mailing lists is a bigger problem than it might seem: mailing lists are where all the open source work gets done. So women become mailing list 'lurkers,' invisible from Linux projects. "Right

now we have no examples of women being treated badly – there need to be women involved in the project first," laments Samba's Allison.

Confidence trick

The intimidation doesn't have to be sexist. Sometimes the competitive nature of discussions is enough to deter women. Sure, Linux is a meritocracy – but that means that people hustle to get their ideas heard, and established Linux hackers are not shy in coming forward. "Many geeks seem to have a default email conversational style that amounts to 'I'm obviously right, anyone who disagrees with me is obviously entirely misguided, let me scream at you until you agree with me,'" says Foster. >>

FEMALE ROLE MODELS

This year O'Reilly invited some of the best known women in open source to take part in a panel debate at its OSCon even in Portland. Here are their profiles (from left to right):



Zaheda Bhorat

Manager, open source programs at Google, OpenOffice.org advocate
Academic background: BSc in computer science

What she says: "For me, I didn't have a family, but it got to the point where I didn't have a life outside of work."

Alolita Sharma

Co-founder and CEO of Technetra, FOSS advocate in India

Academic background: Computer science, George Washington University
She says: "The inclusiveness of the open source community represents an ideal which can flatten the barriers to entry and spread the benefits of participation in the worldwide IT revolution."

Allison Randal

O'Reilly editor, board member (and former president) of Perl Foundation
Academic background: Linguistics
What she says: "For every bad story, there are 20 or more good stories of guys who encouraged me, admired my intelligence and coding skills, and treated me with the respect that every human deserves."

Claire Giordano

Senior manager, OpenSolaris
Academic background: Applied Mathematics and Computer Science, Brown University

What she says: "I'm still figuring out my thoughts about the Women In Open Source panel. Stereotyping can be uncomfortable for me. But boy oh boy was it well attended – by men and women alike."

Mitchell Baker

President, Mozilla Foundation
Academic background: Asian Studies, Berkely. Trained as a lawyer at Boalt Hall School of Law
She says: "It matters when you have kids, it really does."

Danese Cooper

Senior director of open source strategy for Intel, and OSI board member
Academic background: French Literature, UCLA
She says: "My school was co-ed, but I was a nerdy girl anyway. I wasn't particularly thick-skinned, in fact just the opposite, so perhaps I did develop some *cojones* later as a young woman."

« This lively, sometimes aggressive atmosphere leads to things like Carla Schroder's "Survival Tactics For Women In FOSS", currently doing the rounds on the female-focused LinuxChix mailing list. But if there were a bigger pool of women to start with, it wouldn't matter that some were thin-skinned or uncomfortable. To find out why there isn't, we have to take a step back and look at the wider world of computer science.

An image problem

"[Girls] have little understanding about what engineers or computer scientists actually do, and some of the people giving them information (parents, high school teachers and guidance counsellors) are not well-informed."
 Cynthia Skier, director of the Women's Technology Program at MIT

Xen, supercomputers, the Xbox 360, *Trout Wars*... Computing might be getting cooler, but try telling that to teenage girls. In a lot of countries, many girls – most of them, according to statistics – just aren't interested. The number of female students in Australia enrolling on courses in IT and telecommunications has decreased to 19% in recent years. Within the IT&T family, computer science courses tend to have even fewer women. At English universities, the percentage of women studying computer science varies between 10% and 15%. And in America, the proportion of women planning to major in computer science has fallen to levels unseen since the early 1970s.

RESOURCES

Mailing lists and forums

Debian <http://women.alieth.debian.org>

Gnome <http://live.gnome.org/GnomeWomen>

KDE <http://women.kde.org>

Kernel <http://linuxchix.org/cgi-bin/mailman/listinfo/kernelchix>

Ubuntu Women forum on <http://ubuntuforums.org>

Project-wide www.linuxchix.org, women@opensource.org

Project-wide www.linuxchix.org, women@opensource.org

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WHAT IT FEELS LIKE FOR A GIRL

Pia Waugh is the vice president of the national user group Linux Australia, a solutions architect for open source software, an advocate and a geek.

"I've been using computers as long as I can remember. My mum was a computer technician, and my favourite photo is one of me on her knee, both of us staring at the computer in deep concentration."

What the photo doesn't say is that she had been building a network and system, walked away for ten minutes and returned to find that I had completely broken it.

My parents were very supportive of their children doing whatever they want. When I was at school I thought there was no inequality. Up to the age of 15 there was only one other person in my class with a computer (a Mac, we fought all the time!). I went into the IT workforce

believing the rumours I'd heard about it being harder for women were untrue, and that it was up to the individual to cast their own destiny.

Then I started bumping heads. I had one gentleman yell at me because I knew technical stuff he didn't, even though I'm "just a woman". I've had several clients ask me when the male technician is coming back, or expect a male to design their project design for them. I haven't had grief from just men, but from men and women alike.

I found a new type of freedom when I found Linux and open source: a community where you are judged on your input, not by how long your legs are, how long your education list is or how much money you have. In only three years of being heavily involved in FOSS, I have spoken at conferences around the



world, learned how to use my technical skills to solve real social problems, influenced politicians, and learned so much about myself and my capabilities along the way. I have also become very proud to be technical, female and strong. Three terms often thought of as mutually exclusive in Australia."

Reena Pau is looking at the reasons for the low numbers as her PhD at Southampton University (where the proportion of female computer science students is around 10%). "A key word coming up is the word 'boring', she says. "There seems to be a lack of understanding that as a computer scientist you still have to work in a team, understand what the client wants and manage projects."

While girls are not encouraged by parents, school and society to get into computing at a young age, FOSS will be denied a stream of interested female newcomers. With a poor perception of computers and few female mentors or role models, no wonder girls find the subject boring.

Some of the most successful women in open source started very early: Allison Randal says she was handed a soldering iron and chip board by her father as a young child. "I've never thought about whether it was unusual for me to be a programmer," she says. Without that kind of support, Pau believes girls lose interest in computers aged around 11. "At that age girls do not want to be associated with what boys do," she says. "They will happily play [computer] games against brothers and dads, but they won't with their friends."

It doesn't have to be this way. In Malaysia, where girls are positively encouraged to take up computing as a career, women outnumber men in most IT-related subjects in universities; in Qatar, it's more culturally acceptable for girls to go into computing than boys,

who are more expected to be a soldier or a police officer.

School's in...

This summer, 40 of the brightest girls in the United States travelled to Cambridge, Massachusetts, where they would spend the next four weeks immersed in electrical engineering and computer science (EECS). They were taking part in the Women's Technology Program, hosted by MIT. Their 11th grade academic records had to be excellent, but interestingly, no prior experience in computer programming was required. This was all about getting girls into computing – an activity they might not have previously indulged in.

"When we get back our exit questionnaires, many of the responses indicate that the students did not expect our program to be as much fun," says Cynthia Skier, director of WPT. "My

hope is that they come away knowing that people in EECS are not glued 24/7 to their computer screens."

Participant surveys like these suggest girls thrive in focused computer clubs and camps. There is also evidence that girls do more with computers and are more confident about their IT ability in single-sex schools than if boys were in the class.

Andrea Stern, a lecturer in information services at the University of Sydney and a former software developer, is a strong believer in the beneficial effects of collaborative working and mentoring for girls. In September Stern oversaw analysis of a three-day Women And Girls In IT workshop hosted by her final year students, where girls dismantled a PC and created a website, as well as working with mentors from the university and firms such as Cisco. In a



Students taking part in the UK's Computer Clubs For Girls programme. The clubs are run after school by teachers or volunteers.

post-workshop survey, 80% of the girls agreed or agreed strongly that they would consider IT a career (from 40% before the workshop), and 90% said they found the mentor sessions helpful.

All over the world more and more projects are springing up to close the gender gap in IT. Not many of these projects are Linux projects, but that's not to say they couldn't be. Barton Massey is seeking funding for an open-source computer science initiative, and is adamant that open source can be used to get girls into computing, because it can provide an enthusiastic, supportive community.

"It's important with something like open source that girls are introduced to it between (if not before) the ages of 11 and 14 so it is part of the common computing knowledge," says Pau. "I think the essence is to get them hooked."

Some of the educational projects are sponsored or organised by

programming seriously as a career.

IBM is involved in several initiatives to increase female participation. The company employs around 330,000 people, and 94,000 of them are female; 43,000 being 'technical' staff. The company sets special store by its commitment to working mothers. And that's important, because a 2003 study by Daniele Meulders showed that drop-out rates of women in science are much higher for women with children.

At the smaller end of the scale, Linspire, which employs only about 85 staff, has five female employees in its engineering department. It has had female interns in the past, and has started to post job vacancies on women-friendly mailing lists. Theresa Brennan says the company plans to do more to attract women to Linux.

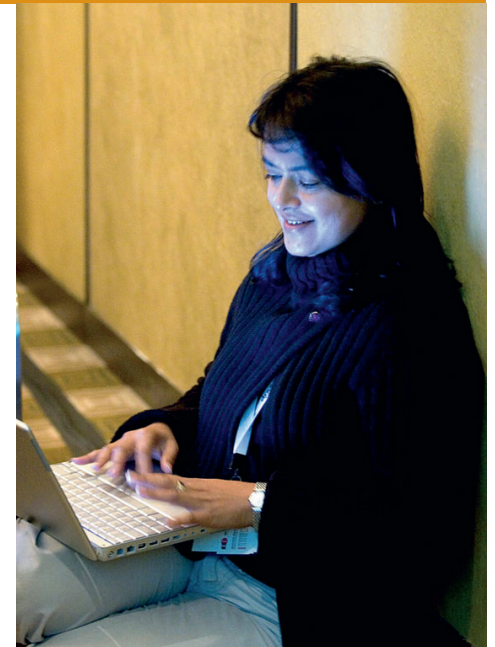
Ghetto or gateway?

All these initiatives can help to bring

Reena Pau's "hooked" enthusiasts the community is providing women's user groups and mailing lists to give them a soft landing on to *terra Linux*. Some are specific to projects, such as Debian Women. Others, such as LinuxChix, cut across projects.

These lists and forums are places where women can post technical questions or problems in a supportive environment, confident that they won't be told to RTFM. There are women who don't need them, and prefer to get stuck in on the main mailing lists, but others find them an oasis. "The most important thing we do is allow people to meet other people with similar interests in Debian in an environment where they know it is OK to ask questions and to make mistakes while they learn," says Helen Faulkner of Debian Women.

Although these lists stress they are women-focused not women-only, not everyone in the community likes them.



Google's Zaheda Borat at OSCon in Portland this summer.

main lists to ask questions or start contributing to projects. "When posting changes or new features, people will criticise the code," admits Kroah-Hartman. "They do this to help teach you and keep the quality of code as high as it is."

People devote their lives to Linux and are passionate about – and protective of – the code. *SQLite* creator Richard Hipp takes this to extremes, contributing 99% of the code with a trusted deputy and rarely accepting code that doesn't meet his standards.

So women (indeed, any Linux newbies) should learn to accept criticism, and try not to take it personally – unless the author makes it personal. For persistent pests, Carla Schroder suggests using mail filters and the **ignore** command in *IRC*. If a particular project or development community proves consistently hostile or unfriendly, women can do as Karine Delvare did and try somewhere else.

The beauty of open source is that somewhere there will be a project that suits your personality, interest and skills.

"If I were to give one piece of advice to any woman interested in getting involved in open source it would be this: ignore what other people say or think," says Allison Randal. "Stop hiding. Reach out and let the world see how amazing you are. You may even surprise yourself!" **LXF**

■ Do you think the community should be ashamed of the low numbers of female contributors? Or are attempts to increase those numbers just "social engineering" as 'Arker' says? Write to lxr.letters@futurenet.co.uk.

"IN AMERICA, THE PROPORTION OF WOMEN PLANNING TO MAJOR IN COMPUTER SCIENCE IS AT 1970S LEVELS."

business, and companies can certainly play a role in persuading female computer scientists to take

more women to open source, but it's vital that when they get here they are given a warm welcome. For people like

HOW MEN CAN HELP

- Stick up for women on forums if they're being abused.

"I help on the kernelnewbies mailing list and give talks and tutorials to user groups on how to become a kernel developer."

Greg Kroah-Hartman



- If you think posting a sexist joke will ease tension on a forum, don't. Generally, any comment that requires "Sorry, couldn't resist ;)" in brackets isn't as funny as you think it is.

- Give your wife the night off the cleaning and looking after the children so she can pay with Linux for a bit. Sorry, couldn't resist ;)

- Involved in a LUG? Try to ensure you hold meetings that are in a safe part of town for women to get to at night,

welcome any women who attend, and brief your male members **NOT** to ask them out for a drink.

- Support open source educational software – find out if your any of your local schools use Linux.

- Try not to indulge in flame wars. Yes, they may be fun, but others can find them boorish or intimidating.

"Teach your daughters to code."
Danese Cooper



- Get involved in an outreach program or after-school project. If the organisers want women as mentors, perhaps you could help out with organisation or raising sponsorship.

Some think they're divisive or sexist. "It's just dumb, it's admitting that [women] are underrepresented and putting them into a separate cabinet because for now they are so small that we should fit them in there," wrote 'Mrtn' on the Ubuntu Women forum recently.

The answer seems to be to ensure the groups don't become ghettos – that they actually lead into real contributing. "I certainly think women should be free to congregate and create safe harbours," says Danese Cooper. "But any community chartered with furthering inclusion and bridging can't afford to be divisive, and in fact needn't be."

Bite the bullet

"Don't wait! Developing open source is an incredibly satisfying and fulfilling pastime and effort. The feedback you get from the community and your fellow developers is something that must be felt to be appreciated."
Jim Jagielski, *Apache*

One of the things such lists could do is to tell newcomers to be prepared for a little turbulence when they enter the