



READ MY LIPS

PROGRESS

Lip-syncing isn't a problem just for pop performers and old martial arts films. Getting the sound and pictures to match is a real difficulty for digital video broadcasters. Because the audio and video signals can go through a different number of encoders and decoders in a viewer's receiver, they can wind up out of sync with each other. Anything more than a few milliseconds is bothersome to viewers, especially if they're watching something with a lot of speech, such as a newscast.

The usual method for checking synchronization requires special equipment and a test signal that interrupts the broadcast. So engineers at Kyungpook National University in Daegu, South Korea, have come up with a way of embedding an easy-to-read test signal that can be run during normal broadcasts. They embedded the test signal in the part of the video signal that is not normally displayed on televisions and, similarly, embedded an audio marker in the part of the digital audio signal used for transmitting in multiple languages. They then came up with a way of measuring the difference between the signals with an ordinary oscilloscope instead of the special equipment, so broadcasters can make adjustments more frequently and for less money.

DTV Lip-Sync Test Using Time-Indexed Audio and Video Signals Without Effect on Program, by Chan-Ho Han and Kyu-Ik Sohng, *IEEE Transactions on Broadcasting*, March 2005, pp. 62–68. ■

as a senior engineer for Siemens VDO Automotive Corp., a subsidiary of the huge German company. But like many U.S. engineers these days, he's more excited about trading a small, shaky employer for a strong worldwide conglomerate than about his pay increase. "I got a little bit of a raise, and the benefits are better," he says.

In general, U.S. engineers are seeing modest salary gains this year, and wage freezes are pretty much a thing of the past. The American Association of Engineering Societies' Engineering Workforce Commission reported that in 2004 U.S. engineers in all disciplines saw only a 1.5 percent gain in compensation after inflation over the previous year. For EEs, any raises came on top of a median salary of US \$99 500, according to the latest IEEE-USA salary survey.

What's more, "the raises are very selective," points out Steven Patchel, high-tech compensation leader in the Santa Clara, Calif., office of Watson Wyatt Worldwide, a human resources consultancy. "A lot of people get nothing or a token raise, while the best performers get an order of magnitude more"—that is, raises of 10 to 20 percent.

Engineers in Western Europe are seeing similarly modest gains. They still earn less than their U.S. counterparts do, though. That's clear to the management of Emulation and Verification Engineering SA (EVE), based in Palaiseau, France, which has a facility in high-priced Silicon Valley.

"In Europe, \$60 000 a year is a good package for an experienced engineer, and \$100 000 is well beyond the reach of an engineer," says Lauro Rizzatti, general manager of EVE-USA Inc., in San Jose, Calif. "But here in Silicon Valley, some engineering specialties average over \$100 000 per year." Despite the high salaries, it's critical for an electronic design automation company like EVE-USA to be in Silicon Valley, says Rizzatti, who notes that raises there are running 2 to 4 percent these days.

Meanwhile, engineers in low-wage countries such as China and India are enjoying the kind of double-digit salary increases their U.S. counterparts last saw during the dot-com boom. The job market in India has been so active that Magma Design Automation Inc., of Santa Clara, Calif., which operates several facilities in Asia, recently had to make a midyear adjustment to what's normally a once-a-year fine-tuning of salaries.

"At the last juncture, we saw increases greater than 10 percent in India," says Camellia Ngo, human resources director at Magma. At the company's other facilities

around the globe, meanwhile, salaries have risen, but "nothing dramatic—4 percent on the very high end," says Ngo.

Expansion by Western companies into Asia doesn't show any signs of a slowdown. "We're expanding in low-cost areas like China and Singapore and doing less hiring in higher-cost areas like continental Europe," says Bill Boyce, vice president of human resources for semiconductor manufacturer STMicroelectronics North America, based in Carrollton, Texas. Salaries are only one factor driving that move, he adds. Pensions and health-care costs are also much lower.

Human resources specialists note that former Soviet bloc countries are also increasingly attractive to companies looking for less expensive technical talent. "Eastern bloc engineers are cheaper than those in the U.S.," says Mike Bristow, manager of compensation and benefits at Siemens VDO Automotive.

Though the U.S. economy is said to be picking up, that hasn't necessarily translated into robust hiring or salary increases. A case in point is the defense industry. By all accounts, business is booming. "Over the last 12 to 18 months it's [become] much harder to find talent," says Jim McNeely, staffing director at defense contractor Northrop Grumman Corp.'s Integrated Systems sector, in El Segundo, Calif. He cites increased defense spending as one of the key factors.

But defense salaries have yet to pick up much steam, with raises of about 4 to 5 percent, only slightly better than those in other engineering fields. On the other hand, companies like McNeely's are giving many more signing bonuses.

Retention bonuses—cash awards meant to persuade key employees to stay with the company—are also reappearing to a small extent. One company that Watson Wyatt's Patchel works with has roughly 8000 engineers, 70 of whom will be offered retention bonuses. "That's not a lot, but last year that 70 was a zero," he says.

Bonuses weren't part of Narney's compensation package when he joined Siemens. But he did get his new employer to provide a relocation package for his 650-kilometer move. Many of the companies he spoke to didn't even offer that. "Not only are they looking for drop-ins, they want one who's across town," says Narney. ■

ABOUT THE AUTHOR

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