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CAD researchers hear professional ethics warning


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SAN JOSE, Calif. — Professional ethics in research, publications, mentoring, and record keeping are an important part of any scientific or engineering field, according to a speaker at the International Conference on Computer-Aided Design (ICCAD) here Tuesday (Nov. 7). But there are "gray" areas where opinions differ, said Frances Houle, research staff member at IBM's Almaden Research Center in San Jose, Calif.

Houle, chair of the 2003 [American Physical Society \(APS\) task force on professional ethics](#), is a chemist, not an engineer. But several hundred CAD researchers crowded into a ballroom to hear her talk, which was sponsored by the [IEEE Council for EDA \(CEDA\)](#).


"Research involves unpredictability and ambiguity, but there are rules," Houle said. In the "black and white" category, she said, are three types of research misconduct [defined by the U.S. government](#). These are fabrication, in which data is made up; falsification, in which data is twisted and manipulated to support a thesis; and plagiarism, in which someone else's work is claimed as your own.

Beyond these obvious forms of misconduct, she said, ethical behavior requires truthful, careful handling and reporting of data; responsible interactions with colleagues; and honesty in publications, which means that one cites prior works, credits all authors, and doesn't issue multiple publications on the same work.

The APS task force that Houle chaired did some surveys, and found that most young physicists learned about ethics from "informal discussions," not classrooms or tutorials. Nearly 40 percent of the junior members of the APS disclosed that they had observed ethics violations. Some voiced concerns about being asked to do unethical things, or not being credited for work they'd done.

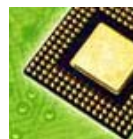
Another "black and white" area, Houle said, is mentoring apprentices. Here, she said, it's important to teach standards for high quality technical work; to discuss ethical behavior; to develop a culture of community; to promote timely professional advancement; and to acknowledge the contributions of everyone.

But there are "gray" areas too, and one of them is documenting



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research. It's clear that all researchers should document their work, Houle said, but it's not necessarily clear how. Other questions include what sorts of records should be kept, what's the best type of research record to keep in electronic form, and what constitutes "original" data.

The responsibilities of co-authors brings up another gray area. Houle said that co-authors have a responsibility to make sure research records are complete, check the results of other authors, completely verify every manuscript that carries their name, and issue corrections if needed. But if you put your name on a paper that turns out to be false, are you as responsible as the person who put the faulty data in? "Not everybody sees it that way," she noted.

To earn the status of co-author, Houle said, an individual should be involved in the generation and analysis of data. But what about a person who secured funding for a project, loaned equipment or code, consulted about a project, came up with the original idea, or is a member of a long-term team with related projects? "These are gray areas. Each community must decide for itself what merits co-authorship," she said.

Houle identified three "seeds" of unethical behavior. These include overconfidence, dishonesty, and career pressure. The latter may result, she said, when a system rewards visibility over quality and provides incentives to cheat.

"This is the beginning of a discussion in our community," commented Andreas Kuehlmann, CEDA's vice president of technical activities. CEDA was [formed in April 2005](#) to create a council that will serve as the focal point for the IEEE's EDA related activities. [ICCAD](#) runs Nov. 6-8, 2006.

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