

Separating Fact from Fiction: A Challenge for the Media

By Jonathan Koomey

“It ain’t what you don’t know that gets you into trouble. It’s what you know for sure that just ain’t so.”

—Josh Billings

One of the less endearing features of the information age is the endless proliferation of attention-getting “factoids” that “just ain’t so.” Take, for example, the amount of electricity associated with accessing the Internet through your smartphone. A recent coal industry-funded study [1] claimed that the iPhone uses as much electricity as two refrigerators when you count the energy needed to make it and to power the “behind-the-wall” equipment to deliver data to the device. Discussion of the original report (“The Cloud Begins with Coal,” which will hereafter be referred to as CBC, written by Mark P. Mills) appeared on the Breakthrough Institute Web site, *Time Magazine Online*, *MSN News*, *The Huffington Post*, *MarketWatch*, and *Grist*, among others [2].

When I heard this claim, it took me back to the year 2000, when Mills and Peter Huber first made the claim [3] that the networking electricity for a wireless Palm VII exceeded the electricity for running a refrigerator (1,000–2,000 kWh, they said, the lower bound of which was a bit higher than the average for U.S. fridges at that time). It did not sound plausible, and so my colleagues and I investigated, finding that Mills and

Huber had overestimated the electricity needed to feed data to a wireless Palm VII by a factor of 2,000 [4].

Around the same time, Mills and Huber also claimed that the Internet used 8% of U.S. electricity, that all computing equipment (including the Internet) used 13%, and that this total would grow to half of all electricity use in the following one to two decades. These estimates also turned out to be too high, with the Internet electricity number overestimated by at least a factor of eight and the total electricity use for computing overestimated by a factor of four [4]–[13].



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Just as happened last time [14], Mills, in the CBC report, has made attention-getting claims that do not stand up to scrutiny [15]. For this latest example, my simple calculations showed that he had overestimated the electricity consumption of iPhones by at least a factor of ten, while at the same time significantly underestimating the consumption of new U.S. refrigerators (he claimed 350 kWh/year, but the average U.S. refrigerator used about 574 kWh/year in 2011, according to Lawrence Berkeley National Laboratory).

The danger, of course, is that policy makers and business planners will be misled by such claims, as they surely were last time, and make consequential mistakes [8]. The bigger story, however, revolves around the credibility of the source and how the media treats him. If scientists make claims that have been shown repeatedly in the peer-reviewed literature to be incorrect, they would normally retract their results and admit their errors. That is how science is supposed to work. If they fail to accept these results and continue to make the same misstatements without presenting empirical evidence to support them, they are effectively ostracized from the scientific community and are not taken seriously again.

Professional reputation is precious and perishable, and those who violate the scientific code of content face intellectual exile. It is very hard to regain your scientific reputation once it is ruined, but the media world is different. Like Mills, many people make incorrect statements but continue to get media attention even after their claims have been soundly refuted in the technical literature (Bjorn Lomborg, famous for authoring *The Skeptical Environmentalist*, is another archetypal example). It should not be that way, of course, but the media often fall into this trap.

CAUSES OF THE MEDIA TRAP

Why do the media give credence to such incorrect technical claims? I can think of at least four reasons.

1) *The newness filter*: Our current fast-paced media world prioritizes

newness of information, with typical news cycles getting shorter and shorter. This bias toward publishing the most recent information as quickly as possible makes it difficult to get attention paid to in-depth refutations, which often take time to produce and many pages to present (by the time they are finished, the issue they address is already “old news”). In addition, there is a structural bias that works in favor of people creating incorrect factoids: It is much easier and quicker to fabricate factoids that look new, novel, and newsworthy than to debunk them (which often requires significant time, technical training, and careful peer review).

2) *The profit motive*: The pressure on news media to make a profit is, in my view, often antithetical to careful reporting on technical issues. Traditional newspapers have been in a death spiral for years, since the cash cow of classified ads has been displaced by vastly more efficient online marketplaces, but most other media have been under pressure as well. There are few dedicated science reporters today because training someone on those complex issues is not cheap, and media organizations just can't afford that anymore.

Financial constraints also result in constant pressure to increase the number of readers or viewers (in large part to attract well-heeled advertisers), which means that news organizations become beholden (or at least more sympathetic) to the status-quo interests who have the money to advertise. While this may not be a concern for some policy issues, any societal problem that threatens major status-quo interests (such as climate change) cannot fail to get short shrift when news organizations are so dependent on advertising from those very interests.

3) *The romance with contrarians*: The environmentalist-turned-skeptic always gets a lot of attention. It is an old and simple story and one that in many journalists' eyes conveys credibility on the source. However, it is also an easy storyline to fabricate, and it is important for anyone

reading work by self-proclaimed environmental contrarians to view their claims with added skepticism.

4) *The quest for “balance”*: The safest approach for journalists reporting on contentious topics is to stick to what different people say about the issue, writing “he said this, she said that.” But what if there is really a right answer, and people making false and misleading arguments are in the pocket of powerful vested interests? This has happened many times before, with



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cigarettes, lead, asbestos, and most recently on the climate issue [16]. The public needs someone (presumably journalists) to report when someone makes claims at odds with the current scientific consensus so citizens can make an informed judgment. Without such information news stories convey *false equivalence* between claims that are technically accurate and those that are not. That omission creates a bias toward preserving the status quo, one not based on evidence but on a cultural presupposition by journalists that “there are always two sides of a story.”

SOLUTIONS

So most media outlets just do not report sensibly about technical topics. What can they do to fix this problem?

First, news organizations *shouldn't* report on technical issues, no matter how delectable the “factoid,” unless the reporter and editor really understand the topic and have talked with the relevant experts. Second, it is important for journalists to understand that on many technical issues, there really are right and wrong answers and that on these issues,

the safe and comfortable path (to create “balance,” also known by many outsiders as “he said, she said journalism”) is a one-way ticket to really messing up the story. It may be appropriate for some political debates to report both sides in this way, but the public need the media to alert them when serial obfuscators are trying to pull the wool over their eyes. Finally, in this complex technological world, we need more journalists who are trained in technical disciplines. How can we hope to address difficult issues such as climate change when many journalists are not able to evaluate technical claims with reliability?

The initial attention paid to Mills' retread claims about iPhones and refrigerator electricity use provides a cautionary tale for a society struggling to deal with complex issues such as climate change in the 21st century. To face this challenge, we need to alter the way media reporting is conducted on technical issues. It may actually take a movement away from for-profit journalism, as some have proposed, or it may require other innovations. I hope we make the necessary changes quickly. On climate, biotechnology, and many other technical topics, there is simply no more time to waste.

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President's Message *(continued from page 7)*

Irvine.) We will hear much more about their work this year.

THE ASIAN EPICENTER

We will continue to grow our presence in Asia. Why Asia? There has been a shift to manufacture in Asia, in China particularly. The Pearl Delta Region in south China (the area around Hong Kong) is the world's hub for CE, with about 70% of the world's CE products manufactured there. The trend is to shift design to this area as well. Korea, with companies such as Samsung and LG, currently dominates the industry. Taiwan has also positioned itself to be a technology leader, and one cannot imagine the computer industry without Taiwanese companies such as ASUS. Of course, there are other players, including Apple, but the epicenter of our industry is in Asia.

One only needs to look at our Society to see the significant contributions made by our Asian colleagues. No other country submits as many papers to our conferences as Korea. Without the input

from Korea, Japan, and Taiwan, we really would not have a Society. China is on the rise, and anybody who has had the opportunity to visit China knows what changes have taken place there. Given this situation, our Society needs to engage with the East. We need to have a strong presence there. We have been fortunate enough to have some very good representation from the East. Our Asia-based board members include Prof. Hase from Japan; Prof. Ko and Prof. Paik from Korea (Prof. Ko was last year's president of the Institute of Electronics Engineers Korea); Dr. Robin Bradbeer, a British expatriate, now retired in Hong Kong; and Prof. Nicholas Vun from Singapore.

As Prof. Hase said, it is imperative that we wake up the "sleeping giant," the United States. The participation of U.S.-based engineers has dropped off considerably over the past years. We are making it a priority to engage with our U.S. members. CE is not dead in America. The United States is still a major center of innovation in our industry. The

CE industry is very fast paced, and it is an industry where innovation is imperative. America leads the way. As a U.S.-based Society, we will put in effort to engage with our members and entice the young professionals to engage with us.

As the new year is starting, I would like to remind our members to renew their CE Society memberships. We are providing a number of benefits that make subscribing to the CE Society a very good value proposition. Perhaps you have a friend to whom you can recommend joining the CE Society? Please do so.

Our award-winning *IEEE Consumer Electronics Magazine*, which is provided to all CE Society members, is worth far more than the membership dues. The interesting articles help keep you up to date with the latest developments in our industry.

I wish all of our members and their families, as well as all our friends, a blessed and prosperous 2014!

