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On Hacking - Richard Stallman

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On Hacking

In June 2000, while visiting Korea, I did a fun hack that clearly illustrates the original and true meaning of the word "hacker".

I went to lunch with some [GNU](#) fans, and was sitting down to eat some tteokbokki (*), when a waitress set down six chopsticks right in front of me. It occurred to me that perhaps these were meant for three people, but it was more amusing to imagine that I was supposed to use all six. I did not know any way to do that, so I realized that if I could come up with a way, it would be a hack. I started thinking. After a few seconds I had an idea.

First I used my left hand to put three chopsticks into my right hand. That was not so hard, though I had to figure out where to put them so that I could control them individually. Then I used my right hand to put the other three chopsticks into my left hand. That was hard, since I had to keep the three chopsticks already in my right hand from falling out. After a couple of tries I got it done.

Then I had to figure out how to use the six chopsticks. That was harder. I did not manage well with the left hand, but I succeeded in manipulating all three in the right hand. After a couple of minutes of practice and adjustment, I managed to pick up a piece of food using three sticks converging on it from three different directions, and put it in my mouth.

It didn't become easy—for practical purposes, using two chopsticks is completely superior. But precisely because using three in one hand is hard and ordinarily never thought of, it has "hack value", as my lunch companions immediately recognized. Playfully doing something difficult, whether useful or not, that is hacking.

I later told the Korea story to a friend in Boston, who proceeded to put four chopsticks in one hand and use them as two pairs—picking up two different pieces of food at once, one with each pair. He had topped my hack. Was his action, too, a hack? I think so. Is he therefore a hacker? That depends on how much he likes to hack.

The hacking community developed at MIT and some other universities in the 1960s and 1970s. Hacking included a wide range of activities, from writing software, to practical jokes, to exploring the roofs and tunnels of the MIT campus. Other activities, performed far from MIT and far from computers, also fit hackers' idea of what hacking means: for instance, I think the controversial 1950s "musical piece" by John Cage, 4'33" (****), is more of a hack than a musical composition. The palindromic three-part piece written by Guillaume de Machaut in the 1300s, "Ma Fin Est Mon Commencement", was also a good hack, even better because it also sounds good as music. Puck appreciated hack value.

It is hard to write a simple definition of something as varied as hacking, but I think what these activities have in common is playfulness, cleverness, and exploration. Thus, hacking means exploring the limits of what is possible, in a spirit of playful cleverness. Activities that display playful cleverness have "hack value".

The concept of hacking excludes wit and art as such. The people who began to speak of their activities as "hacking" were familiar with wit and art, and with the names of the various fields of those; they were also doing something else, something different, for which they came up with the name "hacking". Thus,

composing a funny joke or a beautiful piece of music may well involve playful cleverness, but a joke as such and a piece of music as such are not hacks, however funny or beautiful they may be. However, if the piece is a palindrome, we can say it is a hack as well as music; if the piece is vacuous, we can say it is a hack on music.

Hackers typically had little respect for the silly rules that administrators like to impose, so they looked for ways around. For instance, when computers at MIT started to have "security" (that is, restrictions on what users could do), some hackers found clever ways to bypass the security, partly so they could use the computers freely, and partly just for the sake of cleverness (hacking does not need to be useful). However, only some hackers did this—many were occupied with other kinds of cleverness, such as placing some amusing object on top of MIT's great dome (**), finding a way to do a certain computation with only 5 instructions when the shortest known program required 6, writing a program to print numbers in roman numerals, or writing a program to understand questions in English. (Hacking does not have to be without practical use.)

Meanwhile, another group of hackers at MIT found a different solution to the problem of computer security: they designed the Incompatible Timesharing System without security "features". In the hacker's paradise, the glory days of the Artificial Intelligence Lab, there was no security breaking, because there was no security to break. It was there, in that environment, that I learned to be a hacker, though I had shown the inclination previously. We had plenty of other domains in which to be playfully clever, without building artificial security obstacles which then had to be overcome.

Yet when I say I am a hacker, people often think I am making a naughty admission, presenting myself specifically as a security breaker. How did this confusion develop?

Around 1980, when the news media took notice of hackers, they fixated on one narrow aspect of real hacking: the security breaking which some hackers occasionally did. They ignored all the rest of hacking, and took the term to mean breaking security, no more and no less. The media have since spread that definition, disregarding our attempts to correct them. As a result, most people have a mistaken idea of what we hackers actually do and what we think.

You can help correct the misunderstanding simply by making a distinction between security breaking and hacking—by using the term "cracking" for security breaking. The people who do it are "crackers" (***). Some of them may also be hackers, just as some of them may be chess players or golfers; most of them are not.

Happy hacking.

* Pronounced like stuckbokekey minus the s (with an unaspirated t), if I recall right.

** Going on the great dome is "forbidden", so in a sense it constitutes "breaking security". Nonetheless, the MIT Museum proudly presents photos of some of the best dome hacks, as well as some of the objects that hackers placed on the dome in their hacks. The MIT administration thus implicitly recognizes that "breaking security" is not inherently evil and need not be invariably condemned. Whether security breaking is wrong depends on what the security breaker proceeds to *do* with the "forbidden" access thus obtained. Hurting people is bad, amusing the community is good.

*** I coined the term "cracker" in the early 80s when I saw journalists were equating "hacker" with "security breaker".

The campaign to reclaim the word "hacker" from association with security breaking is doing pretty well, as witness the widespread usage of terms such as "hacklab" and "hackathon".

**** The piece 4'33" is trivial in the mathematical sense. For each "movement", the pianist opens the keyboard cover, waits the appropriate amount of time, then closes it; that's all. It is a musical counterpart of the empty set.

Here are some examples of fun hacks. If they make you smile, you're a hacker at heart.

First, some of mine.

- I learned to use two pairs of chopsticks in one hand, imitating my friend. [Here I demonstrate this.](#)
- Speaking of chopsticks, some kinds of Italian grissini work fine as chopsticks — then, after the meal, you can eat them. I brought a bag of them to Taiwan once just to show them that Italy has chopsticks too.

- [Customer Training College changed to Customer Draining College](#). Sassy, not computer-related.
- In 1981, Newsweek interviewed me for an article on hackers. When their photographer arrived, I decided the article should contain a real hack, so I put on the folk dance performing group's Bulgarian dance costume and held hands with a tentacle-like disused robot arm to give the impression I was [dancing in a line with a robot](#). Sadly, they cropped the photo so that little of the robot arm is visible, and it may not be obvious what we are doing together.
- Photos of some other hacks I've done are [here](#).

An anonymous friend joined me to place the "Barbidall Square" sign on a lamppost at Wellesley College, near the stop for the bus to Kendall Square near MIT. With one single sign we made fun of Wellesley students and of MIT students, in different ways! The sign was removed after a few days, presumably by vandalls.

- In India there is a chain of fine Bengali restaurants called "Oh! Calcutta". The staff, and the clients, have no idea why that expression is notorious. During my 2014 visit to India I decided to educate them by bringing to the restaurant printouts of [the painting](#) itself and a publicity photo from [the play](#). I left a copy of each with the staff.
- Many years ago I had a root canal operation in a molar in the back of my mouth. It was difficult for me to keep my mouth open far enough, and the dentist said this was because I had a rather small mouth.

When it was done, I had him sign a testimonial affirming this fact. I gave it to my mother to show she was wrong about me, all those years when she said I had a big mouth.

- My [puns](#) and [verse and song parodies](#) are also playful cleverness, but the word "hack" does not include verbal wit.
- April fools such as [Yellow Hat GNU/Linux](#) and [Pre-Zen studies](#) are on the border between hacking and wit, because they involve an element of action (fooling someone), not just presenting amusing words.

Other people's hacks.

- Everyone's first hack: walking in the wrong direction on an escalator. That's not the way it's designed to be used, but can you make it work?
- Fighting racism with the hacker spirit: [a coloring book entitled "Some of my best friends are colored."](#)
- Saving Jews from Nazi death camps by [diagnosing them with highly contagious "Syndrome K"](#).

Protecting people from genocide is as serious as a project can be, but there's room for playful cleverness in bending the rules to achieve it.

- I think this [award-winning art project](#) was actually a hack.
- Medicine hackers [distribute instructions for manufacturing medicines](#) to avoid the intolerable prices of the US pharma industry.
- [A robot that climbs windows to deploy a sun shade](#). Pure, sweet, and computer-based.
- [Getting potholes repaired](#) by painting penises around them.
- Making potholes in the streets of Panama City [send tweets asking to be repaired](#).
- [Hoisting Nigerian scammers on their own petard](#). Cunning, mischievous, and not using computers except for email and phone calls.
- [Lady Gaga's](#) approach to clothing seems like hacking to me.
- The band Van Halen put a requirement in its gig contracts to supply [M&Ms with the brown ones removed](#). This was a clever way of determining at a glance whether the people running the venue had really tried to carry out the *other* requirements, which were necessary to avoid expensive damage to facilities.

You could call it a "laziness canary".

- Threatin: [Band Creates Fake Fanbase for Tour Attended by No One](#).

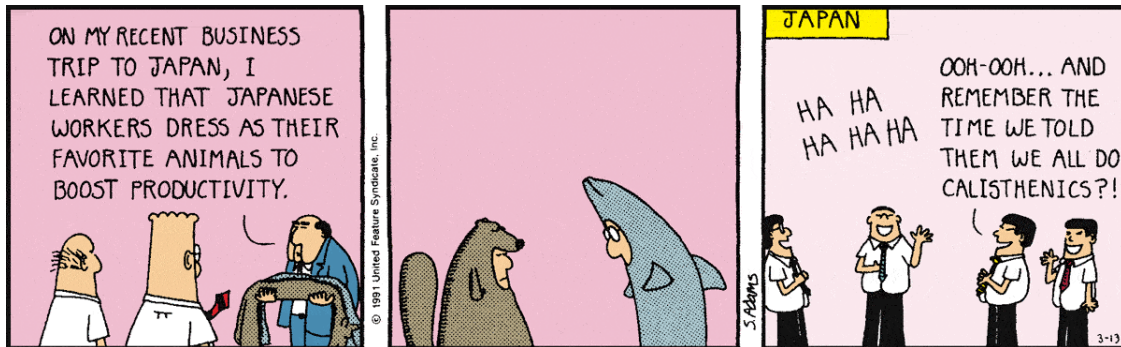
This was quite bizarre, but seems to have caused some real problems for the music venues that were misled.

- The [Piet painting programming language](#) is the most bizarre programming language hack I have ever seen. It is totally unusable if your goal is a maintainable program for practical use, but wow what hack value!

- A charming hack in the [London Underground](#).
- In challenge-level square dance, the caller invents combinations of meta-calls, and the dancers have to figure out very quickly what those calls mean in terms of physical motion. It is not easy, and the set gets messed up from time to time. One caller at MIT around 1980 had a habit of saying "damn it" when that happened.

The dancers were more or less the same group at each session, and being at MIT, they decided to hack the caller: they defined "damn it" as a call, but didn't tell him. They defined the call to mean, "Change places with your corner" — chosen because it would *never* help clean up the mess. Subsequently, each time he said "damn it," he got a puzzling surprise.

- The hacker who made [this poster](#) was arrested for it.
- [Chindogu](#), "unuseless inventions", are subtly absurd hacks.
- Dilbert: [Japanese workers hack credulous US managers](#).



- [TicBot](#) is a conversation hack.
- The ultimate series of hacks with ordinary everyday objects appears in the 1987 film, *Der Lauf der Dinge*, by Fischli and Weiss. (This should not be confused with the unrelated 2006 film by the same name.)
- Although hacking and cracking are conceptually unrelated, occasionally they are found together. This is [hacking that involves some cracking](#).

This hack pointed out the injustice of the laws against "child" pornography, which is good, but doing that by causing other people to be jailed seems wrong to me. (Hacks can raise ethical issues just as other activities do; cleverness and playfulness do not guarantee that one can do no wrong.) It is also foolhardy to taunt a dangerous monster.

- Hacking a Casio calculator with a hard-to-notice second display screen, and internet connectivity, to make it an [ideal device for cheating on exams](#).

I don't approve of cheating on real exams, but the hack is impressive. Besides, if you can design something like this, you can ace your exams honestly.

- A fun hack implemented via cracking: making a TV emergency alert system give warnings about [dead bodies emerging from graves](#).

The security holes that made this possible might be used humorlessly to do real harm, but this hack didn't harm anyone.

- You can make Nike's running-map server [display whatever drawing you like](#) by running on properly chosen streets.
- "Rooftoppers" [scale tall buildings](#) just for the hack of it. I don't share, and can't understand, their desire for risk, but that doesn't alter the fact that this is hacking.
- Acción Ortográfica Quito corrects [punctuation and grammar in graffiti](#).
- A German student filed a freedom of information request to get the questions [for an exam he will have to take](#).
- [Japanese artist Megumi Igarashi](#) is on trial for distributing 3d-printed models of her genitals.

She also built a kayak using that shape. Paddling such a kayak would enable certain fetishists to feel they are really inside her.

- Airline "hobbyists" [hack the rules of frequent flier miles](#) to get lots of air travel without ever needing to pay.

I appreciate the cleverness of these hacks, but repeating the hack every day seems pointless as well as extremely wasteful — like an addiction. Once should be enough.

- [Russian pranksters](#) fooled Elton John by phoning him and pretending to be President Putin.
- Shoppers at Zara stores found clothes with labels saying, "[I Made This... But Didn't Get Paid](#)".
- [Lenny the robo-answerer](#) can waste the time of robo-callers. As on January 2018 you can phone Lenny at +1 347-514-7296.
- A kea (New Zealand parrot) [learned to trigger traps](#) meant to catch stoats. Apparently it did this just as play, because it did not take the bait from the traps.
- A single fake fingerprint can match [20% of all real fingerprints](#), in many fingerprint authentication systems.
- A student housing project in Stuttgart was built by student residents, and the current residents [continue to maintain it](#) and change it.
- An example of using recorded messages to [waste telemarketer's time](#).
- The Satanic Temple is [a hack to oppose creeping establishment of religion](#).
- In the short story, "'Repent, Harlequin!' Said the Ticktockman," by Harlan Ellison, the Harlequin's acts of resistance are hacks. I read it around 1970. Although I did not think of the story often after that, I believe it was an inspiration for my idea of hacking, and the idea of using it for resisting injustice.
- In the movie Brazil, the unauthorized plumbing repairman is a hacker.
- One hacker started taping bananas to walls and selling them as "art" for over \$100,000. Then another hacker [stunned the art world by eating one of these pieces of edible "art"](#).

I have eaten, a few times, in a restaurant in Madrid whose desserts struck me as works of visual art. Not just pretend art, like those bananas, but real art with real beauty. To eat my dessert, I had to overcome my upbringing which taught me that one must not damage an art work.

- *Musicians Algorithmically Generate Every Possible [short] Melody, [Release Them to Public Domain](#).*
- Artist protests using [fake real estate images](#) — and dupes investors.
- [Fake street signs projected onto buildings](#) fool car AI in 1/10 second; humans can hardly see them.
- Berlin artist [uses 99 phones to trick Google into traffic jam alert](#).
- The conman (Trump) was tricked into being photographed with a [humorously altered version of the US presidential seal](#).

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