Open-source software: freedom from ethics?

By Max Bernhard

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Some developers do not want their work to be used for harm, while others think restricting open-source software is contradictory, or at least impractical.

A new open-source licence asks users to respect human rights, but not everyone agrees.

When the US Air Force revealed in December 2019 that it was using the open-source software Kubernetes for its fleet of F-16 warplanes, some programmers took to Twitter to voice their discontent. “Sometimes it’s really hard to justify working as a software engineer to my conscience,” read one Tweet. “Should be clauses in open-source licenses that would disallow military use and government abuse,” said another.

Coraline Ada Ehmke, a software developer from Chicago, has been trying to do just that. In 2019, she created the Hippocratic Licence – named in reference to the Hippocratic oath – a licence that puts ethical restrictions on the use of open-source code.

Open-source software is distributed with a licence that generally allows anyone to use, study, change, or share its source code, without restrictions on how the software is used or by whom. The Open Source Initiative, which governs the most widely used open-source licences, even goes so far as to say that this means “giving evil people freedom, too.” Supporters of the Hippocratic Licence and other ethical licences like it believe it is time for programmers to take a less passive approach.

“It’s time for open-source to grow up and start taking responsibility for how it’s being used. We can’t stick to these [...] libertarian ideals of ultimate freedom, when we exist in a society where the work that we do impacts others, sometimes in devastating ways,” said Ehmke. “I love the way open-source has transformed the world, and I think it has potential to continue. But we have to get our house in order.”

Today most software, commercial or not, relies on open-source code to at least some degree. A 2020 report by Synopsys that reviewed more than 1,000 applications found that 99 per cent contained open-source components. Increasingly, open-source is also used for military applications, the F-16 fleet being only one example among many.

In October 2020, the US Air Force said it used artificial intelligence to control some navigation systems and sensors on one of its U-2 spy planes, marking a watershed moment – most likely the first time AI was used in a US military aircraft. This algorithm, too, relied heavily on open source.

Software and technological advancement were long seen as a booster of democratic progress, and tech workers considered their work to be apolitical. Yet as society becomes aware of the many adverse effects – mis- and disinformation, online harassment, biased algorithms, surveillance – more programmers are starting to think about how their software is used.

Workers at Google, Microsoft and the like can put pressure on their employers to stop using their products in ways they see as unethical, but it is harder for open-source contributors (who often volunteer their work) to reclaim control once their code has been published.

In 2018, some Microsoft employees were outraged when they learned of the software giant's $480m contract to supply augmented-reality headsets, intended for the battlefield, to the US Army. "We did not sign up to develop weapons," they wrote in a protest letter. That same year, the news that Google had partnered with the US military to help develop artificial intelligence for drones led some employees to resign amid widespread protest.

Ehmke said she first created the Hippocratic Licence in October 2019 in response to the campaign #NoTechForICE by immigration rights advocacy group Mijente, which tried to stop tech companies from working with the US Immigration and Customs Enforcement agency (ICE). During the Trump administration, ICE sparked outrage with its inhumane treatment of unaccompanied minors who were sometimes kept in cages, its practice of separating families at the border, as well as violent deportations.

Software engineer Seth Vargo realised that Chef, a company that was using his open-source code, had a contract with ICE, and he decided to remove it from online repositories. "It was an act of conscience. But the open-source establishment denied him the right to control his work," said Ehmke. "Chef said that because they employed him, they own the intellectual property, and all the code was restored in less than a day," she continued. "I was really outraged by the failure of our system to allow a developer like Seth Vargo to take out a stand of conscience against the way his software was being used."

Ehmke wanted to find a way for open-source programmers to deny the use of their work if it was used in human rights abuses and came up with the idea of the Hippocratic Licence.

After launching the licence, Ehmke founded the Ethical Source movement that combines several ethical open-source licences under one umbrella. She said licensing isn't the only way in which she and her collaborators are trying to bring change.

"Licensing is just one prong in our strategy, but we have lots of other things that we care about. We want the entire process to fall into an ethical framework where people are taking responsibility for their impact on society. That goes far beyond the licence that the software is distributed with," she said. "There's this whole notion that technology is neutral. And this is a very, very dangerous idea. Technology doesn't exist in a vacuum. Technology exists within human society. And it's a real shirking of responsibility to say, well, all I did was manufacture it, all I did was create it."

So far, Ehmke's licence has been adopted by several dozen open-source contributors. Many of them share similar motivations for making the change from more conventional open-source licences.

"I don't want to create software for people or corporations who actively destroy our planet and society," said Fynn Becker, a 24-year old front-end developer from Germany who has been active in the open-source community for five years. He adopted the Hippocratic Licence for his projects in light of a growing political far right and ongoing racism, as well as climate change, he said.

"Permissive licences like MIT or Apache originate from a different time. They were great in the early days of open-source, so new projects wouldn't have to deal with legal matters," he said, adding that today he considers them an "easy way out" for programmers who don't think or don't want to think about the ethical implications of their work.

While many companies still enforce licence policies that only allow conventional licences, issues such as biased AI algorithms, questionable labour practices and disinformation on social media have brought ethical aspects of software development into focus, he said. “I don’t see a massive adoption of ethical licences any time soon, [but] I’m glad that people and companies start to think about their behaviour,” he added.

Tarjei Husøy from San Francisco, who is leading a team of software engineers at Medal, a gaming video-clip start-up, shared that sentiment. “Obviously licensing is unlikely to be a silver bullet to solve human rights abuses we see today, but it hopefully is a small change we can make that increases the cost of building tools to assist in such causes,” he said. He compared the effort to software security, saying it was near impossible to build software that is 100 per cent secure, but if programmers make enough of an effort, they could make it uneconomical for hackers to try to attack.

“I hope that having the alternative of picking ethical licences will make people think about how their code might be used. Licensing might not be the solution, but at least for now it helps bring some attention to the problem so that hopefully we can come up with some lasting solutions,” he said. He decided to move his projects to the Hippocratic Licence after hearing that ICE relied on a lot of open-source software for its operations, he added.

The Open Source Initiative indicated in a Tweet that it doesn’t consider the Hippocratic Licence ‘open source’. According to its definition, open-source software “must not discriminate against any person or group of persons” and “must not restrict anyone from making use of the program in a specific field of endeavour.”

OSI co-founder Bruce Perens outlined his criticisms of the licence in a blog post titled ‘Sorry, Ms. Ehmke, The ‘Hippocratic Licence’ Can’t Work’. In it, he called the effort “simplistic and self-contradictory,” and wrote, “the point here is that the definition of what is ethical changes over time, from place to place, and from one individual to the next.”

Another common criticism is that enforcing the rules imposed by the licence might be tricky. Some supporters of the Hippocratic Licence share that concern.

“The issues and controversy around ethical licences come from the enforceability of them. This is one particular weakness of the Hippocratic Licence,” said Filipe Laíns, a developer from Portugal who moved his projects to the licence recently. “I had to remove it from one of my projects because people were scared about the way it is enforced, and [they were] scared to have legal trouble even if they don’t do anything wrong,” he said. He is nevertheless a strong supporter of the licence and hopes that future changes will address the issue.

Luis Villa, a lawyer specialising in open-source licensing, wrote in a blog post last February that even though he supported Ehmke’s work, he advised the company he co-founded not to adopt the licence yet, citing a handful of concerns.

“The clause of the license that references the UN Universal Declaration on Human Rights allows the licensor to terminate a license based on any allegation (even self-made) of a violation. This makes the licensor judge, jury, and executioner because there is no requirement that the allegation be supported or proven,” he wrote.

Still, the way Ehmke was iterating through the licence version made him optimistic that the project could move to a licence that “meets the moral goals” of projects that adopt it, as well as the “pragmatic needs of the many businesses (like ours) that rely on them,” he added. Villa has since contributed to the project. He said he hasn’t had time to review the latest version of the Hippocratic Licence yet, which might address some concerns.

Ehmke and her collaborators have tried to address some of these concerns in the latest version of the Hippocratic Licence, which was released at the beginning of 2020. The first version of the licence was “very primitive,” Ehmke said. One key aspect the group had to get right in the new version was the enforcement mechanism.

She sought help from an organisation called Corporate Accountability Lab, which got her in touch with a legal team. “We were working really hard to conceive of an enforcement mechanism that was fair, and not an undue burden on either party,” she said, adding that human rights legislation across the world is very spotty, which meant they couldn’t trust that courts in a given jurisdiction would rule in a fair way. She said the enforcement mechanism now included in the licence is based on The Hague Rules for Business and Human Rights Arbitration, which were launched at the end of 2019.

Bastiaan Terhorst, chief technology officer at WeTransfer, a Dutch file transfer service that has adopted the Hippocratic Licence, told us most of his employees support the move. “The concerns we see, inside and outside our organisation, are primarily to do with the fact that the Open Source Initiative has not officially approved this licence as an Open Source licence,” he said in an email.

Terhorst says the Open Source Initiative should understand that software isn’t neutral and it should therefore be acceptable to limit the use of software when it is used to harm others. “In our minds, theoretical absolute freedom (which the OSI defends) should not trump the practical real-world harm that is being done in the world with software, at this moment.”

Part of the reason why the Open Source Initiative and proponents of the status quo insist so sternly on their idea of software freedom may lie in the movement’s history.

“There’s a way in which the world of free and open-source software has allowed for very different types of licences, but nevertheless, there’s always been this sort of hesitancy to restrict based on uses or groups,” says Gabriella Coleman, who holds the Wolfe Chair in Scientific and Technological Literacy at McGill University, Montreal, Canada, and has written about the open-source and free-software movements in her book ‘Coding Freedom: The Ethics and Aesthetics of Hacking’. The big change the Hippocratic Licence and other licenses like it bring is that while there are no limitations on persons or groups; they aim to limit a certain type of use, she adds.

When the Free Software Movement and the Open Source Initiative first launched more than two decades ago, programmers were motivated by other concerns. At the time, the main concern was being able to freely build software, access software, and share with others, she says. “I think back then, the concern was what I call ‘productive autonomy’. People involved in the movement wanted to ensure developers and those who potentially can contribute to development or those who could also just use software, were not prevented from doing so. It was a reaction to a very, very aggressive intellectual property system.

“People now think about ‘Oh, wait, who and what do I want my software used for? And by who?’ And there is much more awareness and a reckoning by designers and developers themselves,” she says, adding that given this new reality, it makes sense to see innovation on licences. “In some ways, interventions by the hacker community, whether it was the GPL by Richard Stallman, or what we’re seeing today, are always in response to social conditions and trends. The social conditions and trends and conversations that were happening in the ’80s are different from what is happening today, so it doesn’t totally surprise me that there’s new licences.”

This doesn’t mean that OSI members are all opposed to ethical licences. In 2020, the initiative formally conducted a survey of current, past and prospective members for the first time in its history. The resulting report documented that “a number of prospective and current members called out their disappointment in the OSI’s responses to the ethical licensing movement,” noting this sentiment was especially common among new prospective members.

One prospective member was quoted as saying that “the OSI could be positioned to lead the current discussion around problems of open source licensing, such as unethical use (i.e. human rights violations).” The report states that members sent “a clear message that, while acknowledging and valuing that the OSI is trusted to speak on the community’s behalf, it must also listen to earn and maintain that trust.”

In March 2020, Ehmke herself ran for a board seat in the OSI's 2020 election. While she didn't win a seat, she came in fifth, out of 15 candidates.

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Contact us

Our Offices

UK, Head office

T: +44 (0)1438 313 311

E: postmaster@theiet.org

China

T: +86 10 6566 4687

E: china@theiet.org

India

T: +91 80 4089 2222

E: india@theiet.in

Hong Kong

T: +852 2521 2140

E: adminap@theiet.org

USA

T: +1 (732) 321 5575

E: ietusa@theiet.org

Tom MacWright

tom@macwright.com

Ethics in Geo

This year I was invited to speak at FOSS4G, the premier conference for open source geospatial tech. Then, of course, everything happened and the conference isn't. It's a pity – I was really excited for it and very thankful that the organizers were willing to take a chance on me, despite my several years of remove from the industry. I had chosen a topic that's near to my heart and also might benefit from a little distance. Not being one to leave scraps on the shop floor, here are some of the ideas: on *ethics in geospatial software*.

The only new market is ads

Part of the optimism of the early 2010s in geo was the sense that we might uncover new markets: that the old markets of oil & gas, real estate, military, and government could be supplemented by something new. Maybe individual farmers would benefit from real-time data, or social apps like Foursquare would be map-first. There had to be money somewhere.

Ten years later, the only new market is advertising. Google Maps became a platform for advertising. Everyone else learned that passive location tracking ('telemetry') was a nice complement to their consumer behavioral analysis.

With the exception of high-end niches like hiking maps, consumer geospatial is an ad-supported industry. You can argue about whether ads *can* be ethical, but there's little debate that they currently aren't: targeted advertising is currently as personal and invasive as is legally allowed, and the USA sets almost no limit. All of the data that is collected and 'anonymized' by ad-tech is potentially re-identifiable, as I wrote in 2018, and geospatial is even more-so than most forms.

It's hard to overstate the influence of intelligence & oil in geo

I admire Christopher's openness about this, and have a few minor stories of my own. Here's one of them.

In 2011, I worked on a specification called MBTiles, which stored image files of parts of a map - map tiles - in an SQLite database, which could conveniently be stored as a single file. Basically the problem we were trying to solve was that FAT filesystems had problems storing thousands of files and that writing thousands of files to a disk or transferring them across the web had really high overhead. So we just wanted one file that we could use without unzipping or unpacking: hence, MBTiles. It was a silly solution to a silly problem and it succeeded because we didn't overthink it.

A little while later, the OGC reached out about standardizing MBTiles, or something like it. It was the latter: they wanted something a lot more complicated. I, at 24 and with a serious disdain for meetings, was included in the meetings. The whole direction of the project, what would become GeoPackage, was really hard to follow: the web apps and open source tools that I could imagine had no need for a lot of the things that were passed down as 'requirements' from the people who were footing the bill.

Eventually, there was a proposal for a certain table to be included with some XML data indicating cloud cover, with a PDF linked from some military site. Then folks started referring to imagery from 'the bird.' I was around then I realized we were designing a format for imagery to be sent from drones to soldiers.

A bunch of readers probably called that one. Looking at the list of OGC members, you can see the military industrial complex in full force: we've got the Army, Lockheed, the Australian DoD, DHS, the NGA, and a whole lot of awkwardly-named defense contractors. There are plenty of open secrets about satellite companies with ≥ 50% revenue from defense and agencies running private copies of OpenStreetMap technology to manage their data.

Oil & defense, of course, haven't just been consuming software or taking advantage of our hard work. Our system of projections & datums is largely thanks to oil money - originally the European Petroleum Survey Group - the EPSG in EPSG, and now the International Association of Oil & Gas Producers. Without In-Q-Tel, there's no Keyhole, so no Google Earth or KML. Without dependable intelligence contracts, who knows if Maxar's constellation of satellites would exist. Or GPS.

But the fact that these interests were so involved in the modernization of the field and are now the largest and most profitable contracts to win shouldn't be reason to accept them indefinitely.

Doing things is possible

I think that this is bad: that the military-industrial complex is either straightforwardly bad, or at least not good enough that you should donate your time to them. But we all have been donating our time to them, via open source software.

There are ways to change the status quo. Consider ethos licensing, which has been extremely divisive. But do yourself a favor by reading lawyers instead of commenters: Heather Meeker's skeptical take and Kyle Mitchell's more positive one. Ethos licensing is a way of using the power of copyright to do more than just protect your rights or give them away: it's the idea that you could prevent human rights abusers from using your work via legal means.

It probably won't work, at least how you would hope. We're in the age of legal realism, in which power and money matters more than the letter of the law. And you probably shouldn't call it 'open source' because the OSI, the organization that controls the term (somehow?) says that ethos licensing isn't open source. But using an exotic license would *work* in the case of large companies which have explicit lists of allowed & banned licenses, like Google.

There's a lot more

This is the facet of ethics in geo that's been on my mind recently, alongside the pressing need to recreate from the ground up the American police system. But there is so much more and I don't want to give some blasé 'read critical theory' take here. For starters, there's the representation problem in which maps only show legal and political boundaries and make it easy to forget recently-murdered native peoples. And the terrifying ease of re-identification of most 'anonymous' datasets, something that only a handful of experts know how to resolve.

How about you?

I want to be clear about who this is for. Some folks are working for ethically fishy organizations trying to make them better, and some might be right. Some people need to hold down a steady job because they have a family and a mortgage. Some people just love writing code that will be useful to others.

When I was working in geo, I mainly fit into that last bit: fortunate enough to know I could be making a little more if I risked my ethics but that I didn't need it. The folks in that situation are the ones I judge the most, who are the most similar to me, the ones who have lots of options and knowingly take the one where you're making the world worse. Why?

For the rest of us, the folks who work on open source software or for companies that make software, the question gets harder. Without ethos licensing, anyone can use the things I write. And while once I wondered who would benefit from that technology, now I know: journalists, sure, and neat startups, and some commercial software outfits.

But there's no question of whether parts of the military and the oil industry use open source geospatial software, they do. We can only wonder whether the most reprehensible parts, like Border Patrol, an organization that had one officer or agent arrested per day from 2005 to 2012, are also using it. Our complicity is limited: without intention, sure, but no longer without knowledge. And until we figure out ethos licensing or something similar, there's no way to stop it.

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