Ethics in Technology

Internet Measurements' Ethical Dilemmas and RIPE Atlas

Vesna Manojlovic
BECHA@ripe.net

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Overview

● Part 1
  - Technical is political
  - Moral obligations of scientists, engineers, hackers
  - Our ethics determine our (technical) choices

● Part 2
  - Ethics of Internet Measurements & RIPE Atlas

● Part 3
  - Question Everything!
  - With great power comes great responsibility
  - Beyond techno-optimism, beyond anthropocentrism: re-connect
Main Inspirations

- [ensr] “Philosophy meets Internet Engineering: Ethics in Networked Systems Research”
Ethics in Science & Technology
Ethics (via Latin *ethica* from the Ancient Greek ἡθική [φιλοσοφία] "moral philosophy", from the adjective of ἦθος *ēthos* "custom, habit"), a major branch of philosophy, is the study of values and customs of a person or group. It in simplest terms is the philosophy on how to act. It covers the analysis and employment of concepts such as right and wrong, good and evil, and responsibility. It is divided into three primary areas: *meta-ethics* (the study of the concept of ethics), *normative ethics* (the study of how to determine ethical values), and *applied ethics* (the study of the use of ethical values).
Interdisciplinary (for example, Environmental)

- Social Sciences
- Nuclear
- Life Sciences
- Philosophy / History
- Physical Sciences
- Formal Sciences
- Applied

- Medicine
  (other applied sciences)
- Engineering
- Computer Science
The oath of Hippocrates, which he gave unto his desiles and followers, which professing Physicke and Chirurgerie, is very worthie to be observed and kept faithfull, of euerie true and honest Artist, although he himselfe were but a heathen man, and without the true knowledge of the huing God, yet for his noble and excellent skill in Physicke and Chirurgerie, he ought not to be forgotten of vs his posterity, but to be had in honorable remembrance for euer.
Classical Sciences Ethical Dilemmas

• Medical sciences
  - Hippocratic Oath, Nuremberg trials

• Technical sciences
  - Nuclear bomb & energy / Russel-Einstein Manifesto
  - Engineering ethics

• Environmental sciences
  - Silent Spring / animal rights
Technical is Political

• The machines, structures, and systems of modern material culture are judged for their:
  - contributions of efficiency and productivity,
  - positive and negative environmental side effects,
  - the ways in which they can embody specific forms of power and authority.

• Technological ideas and technological things are not politically neutral: routinely, they have strong, built-in tendencies. Technological advances are usefully considered not only from the lens of how they work, but also why they came to be as they did, whom they help, and whom they harm. [r]
Programming is Political

• Language is political
• Artefacts are political [art]
• Transcription / translation is political [p]
• Crypto is political [r]
• Code Is Politics [how]

• “The Personal is Political” [feminism]
Modern Sciences Ethical Dilemmas

• Artificial Intelligence

• Nanotech

• Cryptography
  - Cyberpunks

• Cyberspace Manifesto

• Human Rights in Internet Protocols
Internet Ethics: FLOSS, Hackers, Cryptographers
“Free Software” Values

• Individual freedoms
  - to use the software as you wish ;
  - to study the program and how it works (perusing its source code)

• At a collective level:
  - the freedom to distribute exact copies of the program, so you can help your neighbor ; and
  - the freedom to modify the source code and distribute these modified versions under the same conditions.

• https://gnu.org/philosophy/free-sw

• Open Source vs Free/Libre Software?
Everybody needs a hacker
Hackers Ethics

Levy's Hacker Ethic

• Access to computers should be unlimited and total.

• All information should be free.

• Mistrust authority—promote decentralization.

• Hackers should be judged by their hacking, not bogus criteria such as degrees, age, race or position or gender.

• You can create art and beauty on a computer.

• Computers can change your life for the better.
Tips for Academic Cryptographers

- ▼ Attend to problems’ social value. Do anti-surveillance research.
- ▼ Be introspective about why you are working on the problems you are.
- ▼ Think twice, and then again, about accepting military funding.
- ▼ Regard ordinary people as those whose needs you ultimately aim to satisfy.
- ▼ Use the academic freedom that you have
- ▼ Be open to diverse models. Regard all models as suspect and dialectical.
- ▼ Get a systems-level view. Attend to that which surrounds our field.
- ▼ Design and build a broadly useful cryptographic commons.
- ▼ Take adversaries seriously.
8. The Critical Engineer looks to the history of art, architecture, activism, philosophy and invention and finds exemplary works of Critical Engineering. Strategies, ideas and agendas from these disciplines will be adopted, re-purposed and deployed.

9. The Critical Engineer notes that written code expands into social and psychological realms, regulating behaviour between people and the machines they interact with. By understanding this, the Critical Engineer seeks to reconstruct user-constraints and social action through means of digital excavation.

10. The Critical Engineer considers the exploit to be the most desirable form of exposure.
Internet Measurements
Ethics
Theory of Applied Ethics

• Consequentialism
  - Utilitarianism
  - Act Consequentialism / Rule Consequentialism

• Deontology

• Virtue Ethics ("telos")

• Principlism
  - respect for autonomy, beneficence, non-maleficence, justice

• Pluralism and casuistry
Measurements Ethics [ensr]

- Internet as socio-technical system
- Responsibilities resulting from power imbalances
- Meaningful informed consent
- Weighing risks, benefits and values for an ethical analysis
- Status of easily accessible data
- Not condoning potentially unethical research methods
RIPE NCC, RIPE Atlas, Ethics Implemented
The Internet Registry System
IPv6 Addresses Distribution

- /3
- /12
- /32
- /56
- /48
- /48

IANA → RIR → LIR → End User

Allocation | PA Assignment | PI Assignment
IPv4 Available pool
RIPE Atlas

From Wikipedia, the free encyclopedia

RIPE Atlas is a global, open, distributed Internet measurement platform, consisting of thousands of measurement devices that measure Internet connectivity in real time.

https://atlas.ripe.net
Most Popular RIPE Atlas Features

• Six types of measurements: ping, traceroute, DNS, SSL/TLS, NTP and HTTP (to anchors)
• APIs to start measurements and get results
• Powerful and informative visualisations
• CLI tools
• Streaming data for real-time results
• New: “Time Travel”, LatencyMON, DomainMON
• Roadmap shows what’s completed and coming
Measurements Platforms Comparison

<table>
<thead>
<tr>
<th>Platform</th>
<th>Flexibility</th>
<th>Coverage</th>
<th>Blocking resistance</th>
<th>Main use</th>
</tr>
</thead>
<tbody>
<tr>
<td>PlanetLab [16]</td>
<td>High</td>
<td>Low/Medium</td>
<td>Medium</td>
<td>Network measurements</td>
</tr>
<tr>
<td>Atlas [18]</td>
<td>Low</td>
<td>Medium/High</td>
<td>Medium</td>
<td>Network measurements</td>
</tr>
<tr>
<td>M-Lab [6]</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Network measurements</td>
</tr>
<tr>
<td>Tor [5]</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low-latency anonymity</td>
</tr>
<tr>
<td>OONI [10]</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Interference analysis</td>
</tr>
<tr>
<td>Herdict [11]</td>
<td>Low</td>
<td>Low/Medium</td>
<td>Low</td>
<td>Interference analysis</td>
</tr>
<tr>
<td>OpenNet [14]</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Interference analysis</td>
</tr>
</tbody>
</table>

Table 1: Comparison between several popular filtering analysis platforms.

- “Global Network Interference Detection over the RIPE Atlas Network” (FOCI14)
Ethics built into design of RIPE Atlas

- Active measurements only
  - No passive measurements
  - Probes do not observe user traffic

- Data, API, source code, tools: free and open

- Kept set of measurements very limited, in order to prevent placing hosts in danger
Ongoing RIPE Atlas moral dilemmas

• 2013: Opening-up source code

• 2014: Keeping “non-public” measurements available

• 2015: Not allowing HTTP measurements to random targets

• 2016: Security audit
## ECONOMIC

<table>
<thead>
<tr>
<th>Category &amp; Characteristics</th>
<th>Requirements</th>
<th>Example(s)</th>
</tr>
</thead>
</table>
| Protecting business access | • Attribution  
• Contextual | Online services combating censorship/disruption targeting their services or companies |
| Ensuring large-scale access | • Attribution  
• Contextual  
• Compelling  
• Comparative | Department of State, international telecommunications bodies/groups [e.g., ITU, ICANN], RIPE Atlas, M-Lab |
Hackers involvement

- Responsible disclosure
Probes at hackerspaces
https://labs.ripe.net/hackathons
• Students and researchers:
  - Present your Internet-related research at RIPE Meetings
  - Complimentary tickets, travel and accommodation
  - Topics: network measurement and analysis, security, IPv6 deployment, BGP routing, Internet governance, peering and interconnectivity, IoT

• ripe.net/raci
• Publish your research or use case
• Reach out to RIPE Community
• Read about latest analysis or conferences

• labs.ripe.net
Take part in RIPE [Atlas,NCC,community]!

• Join the hackathon!
• Come to the RIPE/ENOG/SEE/MENOG meeting!
• Write for RIPE Labs!
• Join RIPE Atlas community!
  - Host a RIPE Atlas probe!
  - Use our (open) measurements data!
  - Use, modify & improve our (FLOSS) software!
• @RIPE_Atlas, atlas@ripe.net, atlas.ripe.net
Beyond Hackers Ethics
Question Everything!
http://linnytu.com/hacker

drinks

clothing

this is what a hacker looks like.

or is it?

the image of the white, male hacker in a hoodie is harmful and exclusive to people who don't fit that mold.

what if you could change that image?
Hacker Ethic Questions

- Access to computers should be unlimited and total. Who gets to use what I make? Who am I leaving out? How does what I make facilitate or hinder access?

- All information should be free. What data am I using? Whose labor produced it and what biases and assumptions are built into it? Why choose this particular phenomenon for digitization/transcription? What do the data leave out?

- Mistrust authority—promote decentralization. What systems of authority am I enacting through what I make? What systems of support do I rely on? How does what I make support other people?

- Hackers should be judged by their hacking, not bogus criteria such as degrees, age, race or position. What kind of community am I assuming? What community do I invite through what I make? How are my own personal values reflected in what I make?

Allison Parrish: “Programming is Forgetting: Toward a New Hacker Ethic” (2016)
networkedsystemsethics.net  Questions

- **Context**: How would you describe the context within which data is collected (or affected), or phenomena are measured?
- **Aims**: What are the aim and benefits of the project?
- **Benefits**: Why are the benefits good for stakeholders?
- **Purpose limitation**: Can the scope of data collection be limited whilst still
- **Politics and Power**: Are particular stakeholders empowered or disempowered?
- **Risk of Harm**: Could the collection of the data in this study be reasonably to any person’s well-being?
- **Law**: Which bodies of law are likely to be applicable to the operation of the
- **Values**: Which values will the project conceivable impact?
- **Burdens**: Who carries the burden of harms or impacted values, and how?
- **Technology Ethics**: Can the harms and impacted values be traced to part of the project?
- **Function Creep**: Does the project potentially set a precedent for unethical
Question Everything!

“Technological advances are usefully considered not only from the lens of how they work, but also why they came to be as they did, whom they help, and whom they harm.” [r]
Possible Alternatives / Additions to Hackers Ethics
1. A feminist internet starts with and works towards empowering more women and queer persons – in all our diversities – to dismantle patriarchy. This includes universal, affordable, unfettered, unconditional, and equal **access** to the Internet.

2. A feminist internet is an extension, reflection, and continuum of our movements and **resistance** in other spaces, public and private. Our agency lies in us deciding as individuals and collectives what aspects of our lives to politicize and/or publicize on the internet.

3. The internet is a **transformative** public and political space. It facilitates new forms of citizenship that enable individuals to claim, construct, and express our selves, genders, sexualities. This includes connections across territories, demands for accountability and transparency, and significant opportunities for feminist movement-building.

4. **Violence** online and tech-related violence are part of the continuum of gender-based violence. The misogynistic attacks, threats, intimidation, and policing experienced by women and LGBTQI people are real, harmful, and alarming. It is our collective responsibility to protect and support each other.

9. The internet’s role in enabling access to critical **information** - including conversations on health, pleasure, and risks - is essential, and must be support and protected.

10. Surveillance by default is the tool of patriarchy to control and restrict rights both online and offline. The right to **privacy** is a critical principle for a safer, open internet for all. Equal attention needs to be paid to surveillance practices by individuals against each other, as well as the private sector and state actors, in relation to the state.

**Feminist Principles of the Internet**
(Tech) Ethics of Nonviolence

• Nonviolent resistance philosophy of Gandhi & Martin Luther King Jr

• Algorithmically-geeky “Non-violent Communication” by Marshal Rosenberg

• “Guide to Empathetic Technical Leadership" http://empathetictechnicalleader.com
  - FREE to read online: https://leanpub.com/littleguide/read

• Open Source and Feelings (#OSSfeel)
  - http://www.osfeels.com/
Internet of Empathy

• Positive freedom of connectivity, interaction and involvement
  - Instead of libertarian “freedom” as independence and self reliance
• This freedom comes at the price of greater responsibility
• “the intrinsic value of a network does not lie in the sovereignty and independence of its nodes, but in their connectedness,”
• Empathy is willingness to engage with the Other, and willingness to enrich network with our contributions
• From: “To Our Friends” by The Invisible Committee
  https://mitpress.mit.edu/books/our-friends“
Beyond Techno-Optimism
Mobile phone as a tracking, spying device?!
Mobile phone as a tracking, spying device?!

“In our times, people are often willing to make drastic changes in the way they live to accord with technological innovation; at the same time, they would resist similar kinds of changes justified on political grounds.” [art]
A NATURAL PAIRING A data center in Ashburn, Va., seen past a Dominion Virginia Power substation serving it. Worldwide, such centers use the rough equivalent of the output of 30 nuclear power plants.

Brendan Hoffman for The New York Times

1 MILLION WORKERS.

90 MILLION iPHONES.

17 SUICIDES.

THIS IS WHERE YOUR GADGETS COME FROM. SHOULD YOU CARE?
# Squirrels Winning the Cyber-War ;-)

**TOTAL SUCCESSFUL CYBER WAR OPS AS OF 2017.01.08 - 1748**

<table>
<thead>
<tr>
<th>Agent</th>
<th>Success</th>
</tr>
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<tbody>
<tr>
<td>Squirrel</td>
<td>879</td>
</tr>
<tr>
<td>Bird</td>
<td>434</td>
</tr>
<tr>
<td>Snake</td>
<td>83</td>
</tr>
<tr>
<td>Raccoon</td>
<td>72</td>
</tr>
<tr>
<td>Rat</td>
<td>36</td>
</tr>
<tr>
<td>Marten</td>
<td>22</td>
</tr>
<tr>
<td>China</td>
<td>0</td>
</tr>
<tr>
<td>Russia</td>
<td>0*</td>
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<tr>
<td>USA</td>
<td>1</td>
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- https://wiki.techinc.nl/index.php/Hackers_tribes#Squirrels_against_technology

Vesna Manojlovic | SHA2017 | August 2017
With Great Power Comes Great Responsibility
Beyond Myth of Progress, Beyond Anthropocentrism
Countdown to Singularity

Logarithmic Plot

\[ T_E = \frac{1}{\ln \left( \frac{E}{e_0} + 1 \right)} \]

This equation is probably the best kept scientific secret of the century!
Imagine: Society > Science > Internet

• … a society predominantly concerned with preserving its existence (but not endlessly expanding)
• a society with a modest standard of living,
• conservative of natural resources,
• with a low constant fertility rate and
• a political life based upon consent;
• a society that has made a successful adaptation to its environment
• and has learned to live without destroying itself or the people (or squirrels) next door.

• Ursula Le Guin
Right place and the right role in the symphony of life

Mature cultures have found balance with Nature
Imagine if trees gave off wifi signals, we would be planting so many trees and we'd probably save the planet too.

Too bad they only produce the oxygen we breathe.
What If We Create a Better World?

- Energy Independence
- Preserve Rainforests
- Sustainability
- Green Jobs
- Livable Cities
- Renewables
- Clean Water, Air
- Healthy Children
- Etc. Etc.
Responsibility

At a time when science plays such a powerful role in the life of society, when the destiny of the whole of mankind may hinge on the results of scientific research, it is incumbent on all scientists to be fully conscious of that role, and conduct themselves accordingly. I appeal to my fellow scientists to remember their responsibility to humanity.\textsuperscript{210}

\begin{itemize}
\item Responsibility
\item … to humanity…
\item … to the planet…
\item … and to squirrels!
\end{itemize}
Acknowledgements
Main Inspirations

- [ensr] “Philosophy meets Internet Engineering: Ethics in Networked Systems Research”
More references

- [w] http://networkedsystemsethics.net/
- Philosophy of Hacking, by Groente
- Digital Tailspin: Ten Rules for the Internet After Snowden
- Tor, Technocracy, Democracy
- Heather Marsh
- [how] Software Freedom your Way
- Sebastian Olme
- http://guymcpherson.com/2013/12/hackers-ethic-for-the-world-after-collapse/
Even more references, July 2017

- IETF & Human Rights & https://www.rightscon.org/
- “To Our Friends”, by The Invisible Committee
  - https://mitpress.mit.edu/books/our-friends
- “I Hate the Internet” http://weheardyoulikebooks.com/releases/i-hate-the-internet/
- Geoff Huston: "The Internet's Gilded Age" (March 2017) http://www.potaroo.net/ispcol/2017-03/gilding.html
RIPE Atlas references

• https://atlas.ripe.net
• https://labs.ripe.net/hackathons
• “Global Network Interference Detection over the RIPE Atlas Network”
• “Ethics in Network Measurements” (2017)
• “A Field Survey of the Ecosystem Around Internet Censorship, Disruptions, and Shutdowns” (June 2017)
Not Part of THIS Talk:
Nature Strikes Back
Squirrels Winning Cyber-War

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https://wiki.techinc.nl/index.php/Hackers_tribes#Squirrels_against_technology
Jellyfish Attack Nuclear Power-Station

- Reality: https://www.theguardian.com/world/2013/oct/01/jellyfish-clog-swedish-nuclear-reactor-shutdown

- Fiction: http://en.wikipedia.org/wiki/The_Swarm_(novel)
Red Squirrels
Drive slowly
There is a particular Armillaria ostoyae mycelium in Oregon, spread over 890 hectares, estimated to be at least 2,400 years old.
Important things you need to know - Earth user guide
1. This is where you live
2. You and the other 15 million plants and animals are Earth's family
3. 50,000 of these plants and animals become extinct each year
4. We are consuming all other species and causing Earth's 6th mass extinction
5. This is comparable to a large asteroid strike
6. Lifestyle changes can stop this happening

evolvingcaveman.com
ANTHROPOCENTRISM

THE PSYCHOPATHIC IDEA THAT ANY PEOPLE ARE MORE ENTITLED TO FOOD/WATER/SHELTER THAN OTHERS

ANY OTHER BEINGS
ALIEN INTELLIGENCE TO HUMANS:

"FEED THE PIGS AND DON'T TOUCH ANYTHING"
"When you're accustomed to privilege, equality feels like oppression"
White, black, man, woman, straight, gay, Catholic, Muslim, American, Mexican...

...all taste like chicken
OCTOPI WALL STREET

Invertebrates are 97% of animal diversity!

Brought to you by Oregon Institute of Marine Biology, University of Oregon
a) Population collapse following an apparent equilibrium due to a small initial Elite population when $\kappa = 100$. This scenario also shows a different route to a collapse, in which, although Nature eventually recovers, population does not.
I think human consciousness is a tragic mis-step in evolution. We became too self-aware. Nature created an aspect of nature separate from itself.

The honorable thing for our species to do is to deny our programming. Stop reproducing. Walk hand in hand into extinction. One last midnight, brothers and sisters, opting out of a raw deal.
“Hannibal’s wit, erudition, insight into others, artistic sensitivity, scientific knowledge etc. make him almost a walking one man encyclopedia of Western civilization.”

What better symbol of our age than a psychopath & a serial killer?
http://UnCiv.NL

- Mailinglist: https://lists.puscij.nl/wws/info/uncivilization
- Wiki: https://www.unciv.nl/w/
- Mail: contact@unciv.nl
- Twitter: Ms_Multicolor