Resistance Technologies: Moving Beyond Alternative Designs

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Why
(moving beyond alternative designs)

How
(to design)

What
(should we build?)

Resistance Technologies
(Privacy-Technologies)

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“We face limitations in our own thinking about, for example, future technical systems and in our ability to imagine futures that are characterized by various limitations”

Elina Eriksson and Daniel Pargman. "Meeting the future in the past-using counterfactual history to imagine computing futures." *Proceedings of the 2018 Workshop on Computing within Limits*. 2018.

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Why

- Clearly we all agree on the polycrisis we are facing:
  - Crossed at least 7 planetary boundaries
  - Extreme weather events
  - Melting ice caps
  - Heat waves
  - Wildfires
  - Social and political struggles
  - International conflict
  - …

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Why

- **ICT alternatives often fail to challenge exploitative systems;** designed for the current market (thrives on labor and nature exploitation) and the same market undermines them

- **Optimizing tech** can paradoxically **lead to more complexity** and **unsustainability** (Tainter). Integrating features like security into "sustainable" systems often increases cost and complexity (Mühlberg)

- More importantly: Does not take into consideration the **urgency of current and future situation** (wars, colonization, women oppression)
    - We design during the emergency rather than for the emergency

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Why: Technologies during crisis

- **Lack of Autonomy:** Reliance on private infrastructure—like Ukraine's dependency on Starlink is a major vulnerability when access is controlled by a single actor (Elon Musk).

- **Security and Privacy Challenges**: Many crisis technologies, such as Bridgefy and COVID-19 contact-tracing apps, lack critical security and privacy features (message interception, impersonation, user tracking…).

- **Scalability**: Gaza's eSIM
- **Sustainable designs**?

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Why: Collapse Informatics

- **Collapse Informatics** argue for the design of socio-technical systems in anticipation of societal or environmental decline (Tomlinson et al.)

- Focus on resilience, adaptability, and sustainability under resource constraints.

- **Resistance Technologies: Privacy**!

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Why: Privacy

- Privacy is a **fundamental human right**, protected under many legal frameworks—yet, like sustainability, it remains **complex** and **difficult** to define.

- It extends **beyond** consent for data processing:
  - Infrastructure
  - Decentralization
  - Anti-surveillance

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Why: Armed Conflicts

- Climate breakdown fuels conflict and displacement; militarized tech responses worsen the problem.

- Military accounts for ~5.5% of global carbon emissions (Parkinson).

- Intertwined with surveillance tech (lack of privacy):
  - Drones (Civilians are often targeted as collateral damage)
  - Surveillance Cameras
  - IMSI catcher (protests)

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Why: Digital Colonialism

- The control of critical digital infrastructures, means of communication (cables and satellites), but also control over data and computational resources
- Digital colonialism is closely intertwined with surveillance (Andrés Arauz)
  - Data of Money: SWIFT (the Society for Worldwide Interbank Financial Telecommunication) controls any financial transaction between individuals and countries
  - Majority-owned by U.S.
- Sillicon Valley but also NSA

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Why: Gender Inequalities

- Women are most vulnerable to climate change (Abid, 2018)
    - Of 1.3 billion people in the developing world who live below the poverty line, 70% are women
    - Up to 80% of all the food production in developing countries is accounted for by women.
- The far right is experiencing a popular resurgence (Blee et al. 2023)
    - Ban on Abortions
    - Femicides and Domestic violence rose during COVID-19

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How

- **Just Sustainability**: A framework that integrates environmental sustainability with social justice
- **Sustainability Awareness Framework (SusAF)**: Provides practical tools to help designers and organizations assess the environmental and social impacts of software systems early in the development process
- **Computing within Limits**: A vast literature for designing systems within ecological and societal boundaries

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What

- Like privacy and sustainability, resistance technology is unlikely to be defined by a single, universally accepted concept. It is not a plug-and-play solution that automatically makes systems sustainable, private, and resistant.
- Set of features (**lessons learned from privacy engineering**):
  - Minimize dependence on resources provided by large tech corporations (AWS servers)
  - Critical refusal: Less is more (security and safety are more robust when rooted in critical refusal)

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What

- Set of features(**lessons learned from privacy engineering**):
  - Avoid function creep: particularly in systems that centralize data under the pretext of utility but pave the way for these same functions to be used differently (data collection).
  - No centralization: Avoid reliance on centrally provided or controlled resources that may become unavailable or un-trustworthy during crises (For example Microsoft Teams, Starlink)

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Thank you for your attention

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Questions for discussion

1. Besides Privacy-Enhancing technologies, what other ICT do you think are considered Resistance technologies?

2. How can we predict the needs for (and the usefulness of) ICT designs in the non predictable polycrisis?

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