

Framing

Peace Technology: Scope, Scale and Cautions

Margarita Quihuis, Mark Nelson, and Karen Guttieri

Margarita Quihuis and Mark Nelson co-direct [Stanford Peace Innovation Lab](#), where [Karen Guttieri](#) leads the security and development initiatives. The lab creates design frameworks and innovation processes for technologies that measurably improve positive peace. The [Stanford Peace Innovation Field Lab Network](#) is a global research community consisting of thought leaders from the fields of innovation, technology, business, game design, finance, and peace studies. They tweet, respectively, at [@msquihuis](#), [@mark_nelson](#), and [@Karen_Guttieri](#).

What is peace technology, anyway? Technology to bridge divides.

Peace technology, as we have defined it in our lab, is fundamentally mediating technology—it “mediates” our engagement with each other. That is, it acts as an intervening agent, augmenting our ability to engage positively with others. Peace technology as we experience it today contains four sub-components, working together:

1. **Sensors**, such as camera, microphone, accelerometer, magnetometer, compass and location (GPS), that can measure human engagement behavior with ever-greater precision, between any two social entities across difference boundaries such as gender, income, ethnicity, age, nationality, and so on.
2. **Communications** technology, such as cell phones, fiber and Wi-Fi networks
3. **Computation**, particularly distributed and cloud-based computing
4. The above three components enable threat or opportunity detection, and early warning systems. The addition of **Actuators**, which can include humans or devices, allows us to trigger and coordinate action in response.

These four component technologies are now so inexpensive and ubiquitous that your smartphone contains many of each. As Sheldon Himelfarb, writes, “teenagers in violent developing-world neighborhoods are able to build their own peace technology.” Unlike previous technological revolutions, individuals can now design and deploy peace technology at scale almost anywhere in the world.

Technologies developed for other needs can also be appropriated to increase peace (see [Guttieri, 2014](#)). For example, military-funded technologies that we now use everyday such as the Internet and GPS have been redirected for humanitarian relief.

The peacebuilding field can also redeploy innovations from the for-profit tech industry, which invests billions in research to increase positive engagement, as in the AirBnB “citizen diplomacy” example discussed below. Unlike the previous century in which technology was aimed at calculation and accounting and manufacturing processes, today’s technology is focused on facilitating collaboration among groups of diverse people. This is core to the mission of peacebuilding.

Moreover there are new tools rooted in behavioral psychology available to technology developers. We can now measure interpersonal interactions at high resolution, in real time. When we can measure behavior, we can design for it very quickly. Just as we can create apps to facilitate positive health behavior, we can also design technologies to promote positive social behavior. Peace tech is not just sustainable; it can rapidly scale, be automated, and as the Airbnb example makes clear, even be profitable.

However, mediating technologies can also amplify harm. There are critical ethical challenges facing humanity as we seek to deploy these technologies for the greater good. We discuss these concerns and recommend an approach based on what has worked in similar technology domains, after the examples below.

Examples of Peace Technology

As the articles in this special issue show, a variety of technologies are already being used to build peace:

1. Social media fosters cross-sector dialogue and inclusive democratic process in war-torn Beirut
2. SMS technology in Afghanistan enhances government accountability and citizen access
3. Big data analysis by UN Global Pulse on anonymized mobile money transactions creates early-warning systems for food security.
4. SeeClickFix.com connects citizens to local government by making it easy to alert authorities when and where public infrastructure needs repair, such as potholes or graffiti.
5. The Syria Airlift Project's Unmanned Aerial Vehicles (UAVs) are another example of a peace technology. These drones augment the ability of caring people around the world to positively engage with Syrians on the ground in a warzone too dangerous for civilians to enter.

What possibilities await us as people continue to share images and stories across today's early mediating technologies, such as Instagram, Twitter, Facebook and WhatsApp? Beyond simple connections, virtual and augmented reality both create new perspectives. Virtual reality enables us to visualize and "test" hypothetical scenarios. Augmented reality enables users to see both reality *and* also the same 3D holographic imagery, which they can each manipulate. This virtual image creates a shared vision that allows for *you + me = us*, which is more than *you + me*; in other words, a unified perspective. Identities and empathy are potentially transformed.

Peace technologies enhance the ability to trust, permitting more mutual action, thus increasing our positive engagement with people further away from us, both geographically and otherwise. This enlarged identity drives Singer's "expanding circle of altruism," increasing our ability and motivation to help others, as often now happens in the wake of natural disasters.

The new "share economy" is fueled by this ability to trust at scale. For example, Airbnb, a virtual, global bed-and-breakfast company, uses sensors, communication tech, and computation to match hosts and guests worldwide. Hosts and guests do peer ratings to incentivize positive behaviors across geographic and cultural boundaries (among others). This is fine-grained citizen diplomacy, and Airbnb explicitly sees itself in the peace business: "A lot of times, we tend to villainize the other, but when people are traveling, getting to know others, and turning strangers into friends, we create a world where there are a lot fewer people who seem alien to us," says Chip Conley, Head of Global Hospitality for the company.

In 2009, Stanford Peace Innovation Lab partnered with Facebook to show how mediating technology could quantify peace, as measured in episodes of positive engagement. At peace.facebook.com, we focused on the smallest detectable positive behaviors that make a measureable difference – in this case "friending" across various conflict boundaries. No one knows how strong a Facebook friendship is – only that when a Palestinian asked an Israeli to publicly acknowledge him as a friend, and that Israeli publicly accepted, we could measure it. And that weak quantitative signal happened almost 20,000 times a day. What's more, during the 2012 Israeli Operation Pillar of Defense war, friending between Palestinians and Israelis on Facebook didn't drop precipitously; rather, it tapered down slowly, to 16,303 on November 20. It then immediately rebounded to higher than ever at 22,893 friendships on November 23, two days past the ceasefire, before stabilizing at previous levels. By contrast, during the entire war, the worst estimates placed on total killed *and* injured at only 1,478.

As this example illustrates, war *and* peace are rooted in individual behavior. The trends and events we read about in the papers are much better understood at the level of individual human acts that comprise them. This dynamic means it can now be more effective to design technology that enables and triggers new behavior, rather than the traditional approaches of designing policy or institutions to address broader groups.

Concerns

While mediating technology augments our ability to engage positively, it simultaneously increases the potential for harm in three ways:

1. **Omission**, such as distracting us from face-to-face, positive engagement with loved-ones at meals
2. **Commission**, as seen in online bullying
3. **Unintended consequence**, when e.g. increasing ease of trust erodes social bonds. ([Parigi and State, 2014](#)).

The reach and integration of technology in modern life has also created a participation deficit due to varying levels of access. As Ann Mei Chang writes, many voices are still not heard because “only 40% of the world’s population is online...[and the remainder are] disproportionately poor, rural, older and female.” At the same time, this technology is also increasing engagement of disenfranchised minorities at unprecedented levels – [Forrester](#) forecasts that more than 50% of the world’s population will be using *smart* phones by 2017, with most of that growth in developing countries.

By design, mediating technology changes human interaction. As a result, concerns around identity, trust, reciprocity, cyberbullying and accountability must all be rethought in this environment. While we have many concerns, our best estimate is that the upside of mediating technologies does outweigh the risks.

Better technological and institutional designs to manage trust, decrease toxic discourse, and protect privacy are forthcoming. Consider previous technologies like aviation that conferred great advantages, but at a great cost of tragic accidents and intentional harms. Yet every day we, individually and collectively, decide that aviation is worth those risks. Why? Because we have a global organization of engineers who systematically study every accident, then change the designs and regulations to insure that those kinds of accidents will never happen again. In the same way, we need a rigorous, systematic, global approach to these newer, faster, smarter technologies.

Conclusion

Mediating technology improves our ability to engage positively across difference boundaries.

We can now measure interpersonal interactions at a high resolution, in real time. Since we can measure positive social behavior, we can design for it. Tech-enabled peace is not just sustainable; it can rapidly scale, be automated, and even be profitable.

To balance the potential of peace tech, we must remain mindful of serious known risks, ethical dilemmas, and the possibilities of vast unintended consequences that arise from its design and deployment.

As with aviation, doing no harm is impossible as we deploy new peace tech for the first time. But a [*do no known harm*](#) approach is at least possible. A global organization of peace tech engineers and practitioners should work with regulators to transparently analyze and document every peace technology failure,

ensuring the same harm is never repeated. In the same way aviation has become the safest form of travel, peace technology can be come ever safer for those with deep differences who wish to positively engage.