

ENGAGING AMBIVALENCE: INTERVENTIONS IN ENGINEERING CULTURE

The Institute for Applied Autonomy (IAA)

- + The most significant underwriter of engineering research in the United States is the Department of Defense, largely acting through the Defense Advanced Research Projects Agency (DARPA). DARPA exists to channel funds from the military to academic and corporate research labs in exchange for technological innovations that serve the needs of its clients - the Army, Navy, Air Force, and Marines. As DARPA public relations officers are fond of pointing out, innovations funded by DARPA grants may also find expression in civilian applications, particularly in the communications and aerospace industries.

Researchers ('principal investigators') are held accountable to DARPA programme managers via aggressive schedules of milestones, deliverables, and administrative review. Framing this process as a form of cultural co-production implicates both researchers and military officers as active participants in constructing military-funded civilian research, and highlights tensions between martial and academic approaches to knowledge production. This depiction reveals opportunities for interventions that pose deep challenges to engineering culture.

DARPA review as co-production

DARPA's mission, 'to maintain the technological superiority of the US military and prevent technological surprise from harming our national security by sponsoring revolutionary, high-payoff research that bridges the gap between

fundamental discoveries and their military use', is a narrative of transcendence. As the titles of two of its recent *DARPAtech* conferences suggest, the agency is concerned with 'Bridging the Gap' (2004) between laboratory research and battlefield application, or more poetically, with 'Transforming Fantasy' (2002) into martial reality.

Like other institutions that employ 'fantasy into reality' imagery (e.g. Disney, the pornography industry), DARPA is in the business of creating and satisfying desire. DARPA program managers entice academics with fanciful visions of future combat scenarios informed by science fiction and video games. These solicitations are cryptic pronouncements to be interpreted by principal investigators at competing research laboratories and presented back to DARPA in the form of proposals and prototypes. The most stimulating submissions are selected for further development while the rest are abandoned, unworthy of further attention. Principal investigators who keep their programme managers satiated are in turn nourished with DARPA funding and the support of their host institutions. Researchers who fail to satisfy DARPA managers must look to other, less well-endowed, funding sources or be denied resources and, often, tenure.

Research prototypes thus become the 'word made flesh' (or, more accurately, silicon and steel), embodiments of desire created through a cyclical process of co-creation by researchers and programme managers. Through proposal solicitations, review sessions, and demonstration milestones, researchers continuously labor to engage DARPA managers in the co-construction of technologically enabled martial fantasy, enjoying the bounty of continued funding where they succeed and adjusting their products where they fall short.

Re-interpretation as Intervention

Because their operations depend on the unfettered flow of DARPA funding, research and development labs generally rely on literal interpretation strategies when deciphering DARPA solicitations. Artists and amateurs, on the other hand,

have much more latitude in their reading of DARPA texts and are free to explore the metaphorical value of DARPA concepts. For example, our ‘Contestational Robotics’ (2004) initiative proceeds from a loose reading of DARPA’s *Tactical Mobile Robotics* programme:

‘The *Tactical Mobile Robotics* program is developing robotics technologies and platforms designed to revolutionize dismounted operations by projecting operational influence and situational awareness into previously denied areas.’

Recognising the references to ‘denied areas’ as a metaphor for the privatisation of public space, we developed several devices that allow artists, activists, and juvenile delinquents to ‘project operational influence in ways that humans cannot by using reliable semi-autonomous robotic platforms’. Like their military counterparts, our graffiti writing (figure 1) and humanoid propaganda machines (figure 2) are intended to perform actions too risky for human actors - although, in our case, the ‘operations’ include spray-painting slogans and distributing subversive literature, and the “denied areas” are government buildings, shopping malls, and public streets.

Similarly, our metaphorical reading of the *Small Unit Operations: Situational Awareness System* concept (‘mobile communication system... optimized for restrictive terrain’ that relies on ‘wearable computing’ to ‘maintain communications and situational awareness in a difficult urban environment’) substitutes civilians for soldiers and cities for battlefields. Taking this conceptual turn reveals a need to monitor and avoid surveillance camera networks (figure 3), and the utility of a cell phone text messaging service that allows demonstrators to coordinate actions and track police movements during political protests (figure 4).

Normalised Ambivalence

By explicitly addressing political issues, our projects challenge engineering culture. As a practice, engineering proceeds through a highly productive ambivalence about the relationship between engineers and the society in which

they operate. On the one hand, engineers are fundamentally concerned with acting on a world that they perceive as ‘essentially problematic... an opportunity for continuous, useful, material, development’ (Holt 1997). We may call this the da Vinci impulse - the capacity for innovative material production that draws upon all of the arts and sciences to increase understanding and improve the human condition. At the same time, engineering views itself as a service industry whose primary responsibility is to provide technical expertise to its employers (CoEE 2003). This is the Dilbert impulse - the tendency to myopically focus on technical problems and leave consideration of a product’s ultimate use to marketers and end-users.

While the da Vinci impulse energises a highly skilled workforce dedicated to solving ‘hard problems’, the Dilbert impulse provides ethical justification when those problems arise in conjunction with morally dubious applications. The ambivalence embodied in these contradictory formulations of engineering practice is enabled by a conception of technology as value-neutral tool that, by extension, insists technological development is an ethically indifferent activity. This instrumental view of technology (Feenberg 1991) and ambivalence towards the world are normalised through immersion in engineering culture - primarily in technical universities.

In addition to providing technical innovation for the military, DARPA involvement in academia normalises ambivalence among students and researchers. Although the agency’s motivation is to enhance the military’s ability to win wars and kill enemies, open declarations of martial efficacy are rare within academia. Instead, DARPA-supported research is presented to the academic community (including the students working on military projects) in abstract terms, as ‘optimization algorithms’ and ‘enabling technologies’. Civilian applications are highlighted, thus fostering a sense that the particular (and, by extension, all) technologies are neutral. The rhetorical work done by this positioning of military research relies on the slippage between ‘dual use’ technologies, which have a varied but limited set of military and civilian applications, and ‘general purpose’ tools, which can

be brought to bear on virtually any problem. While it may be argued that in practice there can be no such thing as a general purpose tool (Weizenbaum 1976), emphasising civilian applications for a DARPA-funded research project downplays the particular application for which it has been designed and frees the engineer from responsibility for the uses to which it will most likely be put. The culture that celebrates technology's neutrality thus mobilizes ambivalence as a mechanism that enables thoughtful, well-intentioned individuals to work on projects they would otherwise find morally repugnant.

Infiltration and Tactical Aesthetics

As an organisation, the IAA is an exercise in tactical aesthetics - we use the visual and rhetorical devices of sanctioned research organisations in an elaborate performance aimed at infiltrating engineering culture. By demonstrating technical competence, we earn the right to speak to engineers not as activists or theorists, but rather as an 'Institute' of fellow travellers, indistinguishable in many respects from the research organisations where our audience toils every day. Our projects are presented as 'research findings' at university lectures and technical conferences, and are reported on in engineering journals and trade publications. Our critique of engineering practice thus comes from within engineering culture, and is given material weight by the production of working artifacts.

While there is a long history of artists and social theorists questioning relationships between technology and society, there is an equally long history of engineers ignoring art and social theory. By acting as engineers who address contentious political issues, we undermine the normalised ambivalence that characterises engineering practice. The works thus act as Trojan horses, carrying our critique through the gates of detachment that guard engineers against taking responsibility for the products of their labour. In lieu of ambivalence, we offer the engineering community the image of an 'engaged engineering' that works diligently in the service of freedom and human dignity, and takes responsibility for the world it helps create.



Figure 1: GraffitiWriter (1999)

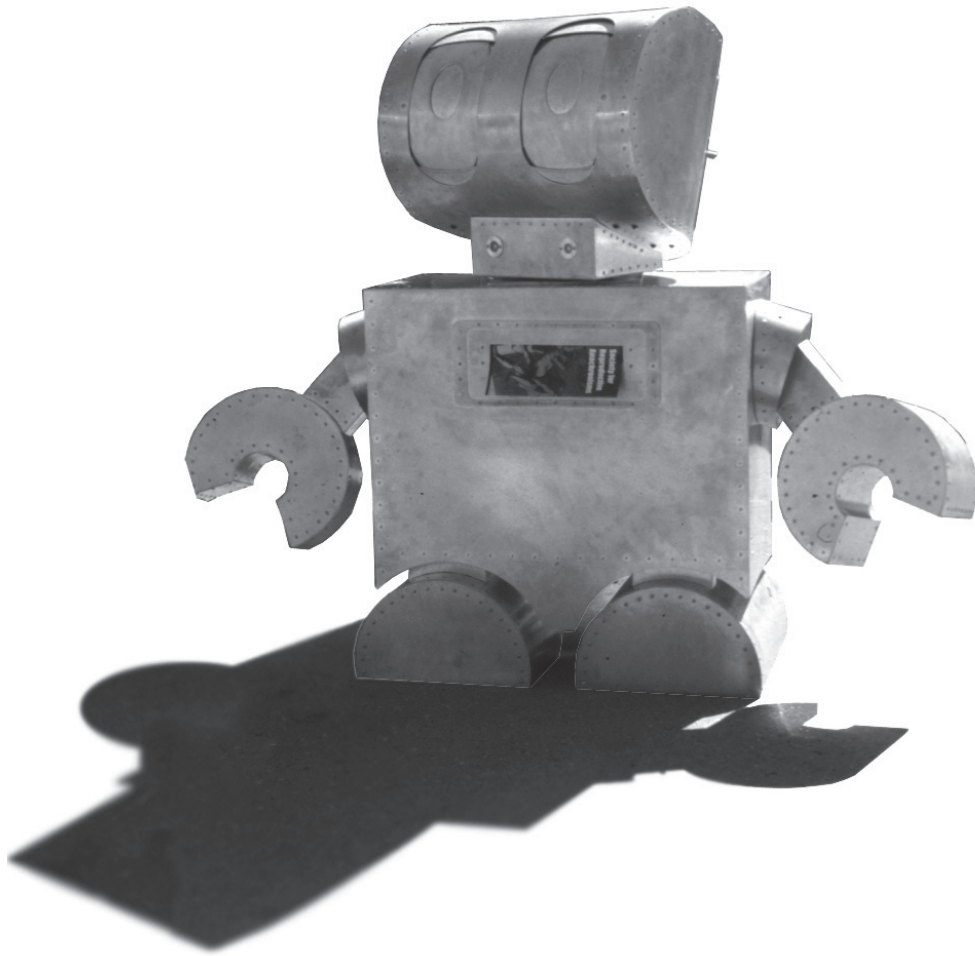


Figure 2: Little Brother (1999)



Figure 3: iSee (2002)

Figure 4: TXTmob (2004)



TXTmob
"nw mor thn evr"

www.txtmob.com

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