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21A.850J / STS.484J The Anthropology of Cybercultures
Spring 2009

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Student A

Schaffer had interestingly portrayed how Babbage's strategy in injecting his invention in London scholarly-tough environment was not just intersected with the socio-politics, socio-economy and religious debates but also required Babbage's personal talent as entrepreneur and pseudo-philosopher. The personality issue of the actor behind the machine is again magnified by Norton Wise in his complex insight of how gender, human physiology and evolution play a significant role in machine development.

Intelligence Co-modification

The critical issue in Babbage proposal to popularize his machine, however, doesn't lie on the skepticism on the functional aspect of the machine –whether or not it's useful or more efficient- but instead, in the suspicion of Babbage tendency to capitalize human talent and local intelligence as his intellectual property. For this, Babbage had to face with two opponents, both from the outside –dealing with the cognitive property of how machine would replace craftsmen -, and from the inside –where he dealt with intellectual property of his engineer, Clement. At some points, Babbage may have a right to claim Clement's work as the agreement between the two can still be evaluated. But how would he claim a patent for untraceable abstract property such as cognitive talent or principle? Should the Greeks claim and take financial advantage from anyone who use Golden Section proportion, Pythagoras theorem or Aristotle's principles? Or should the British have patent for all machine which use Newton's principles? If not, why let Microsoft claim their algorithm?

Here, I believe that it is important to construct the issue of talent acquisition more on the historical frame rather than ethical debate. Thus, one needs to have a clear orientation of their position within the A.I. constellation from the past, and also with the other related branch. For instance, in politics, can today's achievements in Robotic Surgery pacify Marx's anxiety that machines will stultify human life? Or economics-wise, Linux Open-Source Distribution can be opposed to Adam Smith's vision of modern economics? This orientation on multi-intelligence network will be useful guiding us on the path we have chosen, as well as foresee what will be the challenge toward our innovation and the way to inject it appropriately into the society.

Yet, the controversy between Babbage with the London community is still continuing in today intellectual capitalization debate. In fact, it became more intricate and highly political than before, since we are no longer dealing within the scale of the city as Babbage had, but more in the heterogeneous global community.

Machine Feminization

I rather appreciate Wise's essay not in discussing gender merely in term of sexual classification, but rather in the psychological quality that should be embedded in the machine. This translation does not mean to ignore the role of man and woman, but to state the necessity in personalizing machine to enrich their performance which I argue is very much resemble masculine character, less intuitive and too rational. In this agenda, it

wouldn't be enough assigning the right person –man or woman- as the controller but instead, we should actually simulate the feminine character across the system of the machine, such as mimicking the attachment of a child to his/her mother, establishing such panoptical system of mother surveillance to their children, and even impersonating sensitivity and meticulous attention from feminine character.

Student B

Schaffer's article puts Babbage's calculating machines in the factories that were proliferating in the early to mid 19th century Britain, rather than in the lineage of computing machines that leads to today's PC. What I found interesting in this piece was the stratification of humans and human intellect rendered visible by the introduction of intelligent machines. Behind the familiar confrontation between smart machines and traditional labor was the emergence of a new group-analytical managers/philosophers-who claimed to understand the very working mechanisms of all these seemingly self-acting machines. In contrast to the public in the late 18th century who were fooled by the chess-playing Turk or other automata, this group of scientist/philosopher/managers could understand and even design the internal working of these machines, and by extension, the entire universe. When Babbage was creating his intelligent machine, he was in fact creating a social and intellectual niche where people like him could respectfully occupy. The niche originated inside the factory but rose above the factory.

I find myself going back to Riskin's article from last week. If we accept Schaffer's emphasis on the political and social nature of Babbage's project, can the analogy-simulation distinction be useful in understanding these 19th century automatic machines? Can the distinction be made more useful by taking into account Schaffer's concern about the "geography of intelligence"? How does "place" or "geography" matter in analogy and simulation?

Student C

I appreciated how Schaffer shows how the rise of the technological order required the social aspects of technological development be rendered invisible. He uses the Babbage and Clement dispute as an example of how the political –and economic- consequences of this operation were not unintended, quite the opposite, were sought by an economic and intellectual elite, embodied in Babbage, who required obscuring the social order that sustained technology –its makers, its maintainers, and even its creators via machine semiotics-to elevate it to the uncontested status that still enjoys to this day. “The impersonal pronouns in this account are eloquent. To see the automatic world as a system, it was important not to see the work force’s culture.” (p.213) I find this act of projecting agency outside of the human both problematic and fascinating.

Babbage and Clement’s dispute is a rich one. It’s a ground for the re-negotiation of the disciplinary boundaries between manager and engineer, and for the discussion of what we call today ‘intellectual property’. It strikes me from Schaffer’s vision that by helping create machines that were much faster and precise, skilled mechanicians and draftsmen

were perhaps crafting their own obsolescence.

Charles Babbage's fetishist obsession with the restoration of a Silver lady helps condense through analogy Wise's argument of the role of mechanistic metaphors in the construction of gender roles. Wise unfolds the gender issue of automata in the early stages of our industrial era, exemplified in the work of Babbage and some of his contemporaries, tying it to an analogy between a long-standing rooted conception of intellect and body and to a –perhaps less obvious- distinction between engine and mechanism. Wise shows how this system of analogies was perceivable in the definition of certain conceptions of society and biology that entailed “consequences for the place of women in relation to men in the nervous system.” (p.185)

Wise's discussion on how in this game of analogies the emotional and the physical are more closely tied to the feminine, while the intellectual and abstract are more tied to the masculine, should be seen as a way to approach how the symbolic power of the metaphors that emerged during the mechanical age affected not only the 'site' of life and intelligence, as argued by Riskin in *Eighteenth Century Wetware*, but also played a role in the definition of gender identities by a preeminently white male techno-scientific elite, where women were seen –clearly- as inferior beings, a sort of automata, a subject of study, and not as an *other*.

Only partially related note:

The image of Babbage's calculating engine being exhibited in a museum as one of the highest achievements of 'early Victorian machine tool industry' together with Henry Maudslay's block-making machinery -a machine for fabricating blocks for naval construction- is an eloquent instance of scientific discourse being socialized and channeled to popular culture and debate via public institutions. It brought me instantly to the very recent Smithsonian Institution's National Air and Space Museum exhibit of military unmanned aerial vehicles (drones), perhaps the most 'celebrated' automata of our very automated times. What is the gender of drones?

Axe, David. "[Killer Drone Invades Museum.](#)" *Wired*, April 28, 2008.

Student D – Nadya Peek

After reading Wise's text, the lack of an account of Ada Lovelace in Schaffer's text on Babbage becomes more conspicuous. Ada Lovelace is famous for having written the first computer program for Babbage's Analytical Engine, one that calculates Bernoulli numbers. She wrote the program before the construction of the Analytical Engine was completed, and so one might assume that in the dinner parties that Babbage hosted her programs were even more of a hit than jumping from counting in ones to counting in tens.

The text, however, does focus more on the arguments of Babbage and Clement and their development of the factory. Their arguments seem to be a familiar designer vs. engineer discussion with issues of intellectual property. If Babbage were to allow Clement to develop as many machines as he liked, he might not be able to profit from showing it off. The argument does not yet include the fact that he is showing off programs written by someone else, and that she should perhaps also be credited as the author of the programs.

The factory of Babbage and Clement resulted in a division of labour that Wise would also like to see as a division that socially corresponds to gender roles. There is the minding of the machines, and the overseeing of the workers, the former being a caring role for females and the latter being a task more suited for the rational and forceful male. To a certain extent, this was also proved by the hiring policies at the time, and certainly by the figures that were chosen to depict in automata.

Nowadays, however, there is no real gender associated with the robots that are being developed for human companionship. The robots that are from Cynthia Breazeal's lab: Leo is a furry creature with an expressive face, Kismet has no discerning features pointing it in either male or female direction and Tofu looks most like a bird, if anything besides a funny robot. One might argue that Qrio and Asimov by Sony and Honda respectively look more like a boy than they do like a girl, but really they live in an asexual realm of corporate unease. Is it the case that gender does not affect our ability to relate to the machine, or even inhibits it? Is this why the robots that are now being produced are so androgynous?

Student E

Something Interesting

I appreciated Schaffer's analysis of the "social and cognitive distance between designers, machinists, and draughtsmen" (p. 215). The passages reminded me of several papers related to boundary objects from Prof. Orlikowski's course (see references below). For example, Bechky (2003) studies the distance between engineers, technicians and assemblers who draw on different ways of knowing the technologies they design. The engineers work with drawings while the assemblers work with machinery. The technicians alone have access to both drawings and machinery and thus serve as intermediaries between the other two groups. I think the questions related to the distance between Babbage, Clement and Jarvis highlight a similar division where Clement is the key actor who is able to relate to both theoretical, abstract representations as well as concrete, physical instantiations of the machine. These debates show how deeply-rooted certain distinctions between theoretical knowledge and practical knowledge are. These observations are also relevant in connection with Student D's comments about Ada Lovelace. Though I do not know the specific history, it makes me curious as to whether the distance between the actors discussed above arises mostly from the hierarchy between theory and practice or from the socio-economic class divisions of the time. In addition, it raises question about the material or abstract nature of code and whether code can also serve as a boundary object.

A Question: Recursive Thinking

Wise recursively applies the engine-mechanism metaphor to factory work at different levels of analysis. I'd like to focus on the following passage: "It will be observed, however, that following the distinction of engine and mechanism, Babbage's "engine" is actually pure mechanism, for it does not produce its own power but has to be cranked. The conundrum finds its resolution in the analogy between the calculating engine and a factory. Indeed the factory itself consists largely of pure mechanism. But considered as a whole, the factory is an engine of production, producing goods that carry the value of the power transmitted through its mechanism." (Wise p. 175) Wise argues that depending on the level of analysis different aspects of the difference engine or factory work can alternately appear as engine or as mechanism. From close proximity, the gears and cranks of the difference engine are mechanisms, but from a distance and in Babbage's own terminology the apparatus has the productive power of an engine. Babbage associates this productive power with superior intelligence, thus the importance of referring to the mechanism as an engine in order to reinforce its intelligent nature (even though as Schaffer points out this intelligence may have been a mere performance).* In this context, I think Wise makes a very insightful observation about Babbage's strategic choice of words. However, at the factory level the same line of thinking leads to an inconsistency which Wise does not clarify. If the mechanisms inside the difference engine can amount to some form of intelligence then the workers (women!) within the factory as a whole must also be operating intelligently. This conclusion blurs the distinction between rote mechanism and powerful, intelligent engine. While I follow Wise's interpretation of Babbage's application of the terms engine-mechanism to his own machines I think he too neatly transfers this metaphor to the complex relationship between machines, workers and productive energy within the factory.

* Schaffer describes how the analytical engine was only performing according to certain preprogrammed routines. The Wizard-of-Oz behind the curtain was Babbage preprogramming certain miraculous and surprising behaviors putting him in the role of God. "(...) Babbage countered that the world could be represented as an automatic array only visible as a system from the point of view of its manager." (Schaffer, p. 226)

References:

Bechky, B.A. "Sharing Meaning Across Occupational Communities: The Transformation of Understanding on a Production Floor." *Organization Science* 14 (2003): 312-330.

Carlile (2004) cited in Dodgson et al. (2007)

Dodgson, M., Gann, D.M., and Salter, A. "In Case of Fire, Please use the Elevator: Simulation Technology and Organization in Fire Engineering." *Organization Science* 18 (2007): 849-864.