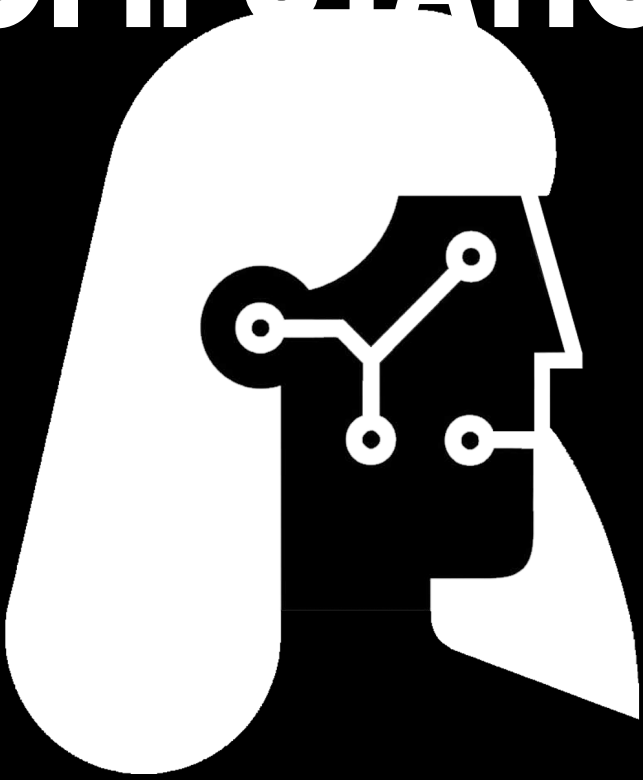
WOMEN IN COMPUTATION



PORTABLE SYLLABUS

1. THE MİDDLE AGES: THE DEMONİSATİON OF WOMEN AS KNOWLEDGE PRODUCERS

WİTCH HUNTİNG AND THE MAKİNG OF MODERN (MALE) SCİENCE.

"[T]he construction of a new patriarchal order, making of women the servants of the male workforce, was a major aspect of capitalist development. On its basis a new sexual division of labor could be enforced that differentiated not only the tasks that women and men should perform, but their experiences, their lives, their relation to capital and to other sectors of the working class. Thus, no less than the international division of labor, the sexual division of labor was above all a power-relation, a division within the workforce, while being an immense boost to capital accumulation."

— Silvia Federici, *Caliban and the Witch: Women, The Body and Primitive Accumulation,* New York: Autonomedia, 2004.

"[W]omen were those most likely to be victimized because they were the most 'disempowered' by these changes, especially older women, who often rebelled against their impoverishment and social exclusion and who constituted the bulk of the accused. In other words, women were charged with witchcraft because the restructuring of rural Europe at the dawn of capitalism destroyed their means of livelihood and the basis of their social power, leaving them with no resort but dependence on the charity of the better-off at a time when communal bonds were disintegrating and a new morality was taking hold that criminalized begging and looked down upon charity, the reputed path to eternal salvation in the medieval world."

— Silvia Federici, *Witches, Witch-Hunting, and Women,* Oakland: PM Press, 2018.

2. THE INDUSTRİAL REVOLUTİON: WHEN COMPUTERS WERE WOMEN

ADA LOVELACE AND THE RİSE OF COMPUTATİON İN THE 19TH CENTURY

"The Engine was left on the nineteenth-century drawing board, and it was a hundred years before anything akin to Ada's software would find the hardware on which to run."

— Sadie Plant, *Zeros and Ones: Digital Women and The New Technoculture,* London: 4th Estate, 1997.

"The Analytical Engine has no pretensions whatever to originate anything. It can do whatever we know how to order it to perform. It can follow analysis; but it has no power of anticipating any analytical relations or truths. Its province is to assist us in making available what we are already acquainted with. [...] It is however pretty evident, on general principles, that in devising for mathematical truths, [...] views are likely to be induced, which should again react on the more theoretical phase of the subject. There are in all extensions of human power, or additions to human knowledge, various collateral influences, besides the main and primary object attained."

— Ada Lovelace, "Translator's Notes to M. Menabrea's Memoir", *Babbage's Calculating Engines,* Cambridge: Cambridge UP, 2010 (1889).

"For reasons at once material, conceptual, and commercial, the first era of widespread mechanical calculation, roughly from 1870 to at least the early 1960s, was one that meshed the intelligence of humans and machines. Increasingly, the human computers who operated the machines were women, [...] the chief attraction of female labor was that it was cheap: even women with college degrees were paid significantly less than their male counterparts."

— Lorraine Daston, "Calculation and the Division of Labour, 1750-1950," 31st Annual Lecture of the German Historical Institute, Washington DC, 2017.

3. WAR COMPUTATİON AND THE INVİSİBLE ENIAC GİRLS
THE FEMALE DİVİSİON OF MENTAL LABOUR İN THE 20TH CENTURY

''Cathleen McNulty described how their work overlapped with the construction of the ENIAC: ''Somebody gave us a whole stack of blueprints, and these were the wiring diagrams for all the panels, and they said 'Here, figure out how the machine works and then figure out how to program it.' [...] Well once you knew how an accumulator worked, you could pretty well be able to trace the other circuits for yourself and figure this thing out.'' Understanding the hardware was a process of learning by doing. By crawling around inside the massive frame, the women located burnt-out vacuum tubes, shorted connections, and other nonclerical bugs.''

— Jennifer S. Light, ''When Computers Were Women'', *Technology and Culture*, vol. 40, n. 3, 1999.

''The Treasury had brought into being an underclass of information workers who were functionaries of the state without having full civil rights, and a sphere of work whose importance was rapidly increasing out of all proportion with the value accorded to the workers who performed it.''

— Marie Hicks, *Programmed Inequality, How Britain Discarded Women Technologists and Lost Its Edge in Computing*, Cambridge: MIT Press, 2017.

See also: Jacob Gaboury, ''Queer History of Computing'', *Rhizome* journal, February 2013.

4. THE AGE OF THE CYBORG: NOMADİC SUBJECTS AND MUTANT BODİES
CYBERFEMİNİSM İN THE 1980S

''There is nothing about being 'female' that naturally binds women. There is not even such a state as 'being' female, itself a highly complex category constructed in contested sexual scientific discourses and other social practices. Gender, race, or class consciousness is an achievement forced on us by the terrible historic experience of the contradictory social realities of patriarchy, colonialism, and capitalism.''

— Donna Haraway, ''A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century'', *Simians, Cyborgs and Women: The Reinvention of Nature*, New York: Routledge, 1991 (1984).

''The cognitive character of contemporary capitalism and its high technological mediation paradoxically produced a 'post-theory' mood and intensified attacks on radical thought and critical dissent. [...] And yet, the vitality of critical thinking in the world today is palpable, as is a spirit of insurgency that sustains it.''

— Rosi Braidotti, ''Preface'', *Posthuman Glossary*, London: Bloomsbury Academic, 2018.

5. THE AUTOMATİON OF GENDER AND RACİAL DİSCRİMİNATİON
THE REGİME OF ARTİFİCİAL INTELLİGENCE İN THE 21ST CENTURY

"The implementation of logic in machines [...] did not only mark the end of reasoning and the failure of deductive truths, but also the very dawn of instrumental thinking: the origination of an alien activity of automated cognition. [...] We should find in it the tools to critically reclaim the unknown and the incomputable from the paranoid apparatuses of the white-male subject of humanism, and equally from a mindless trust in the error."

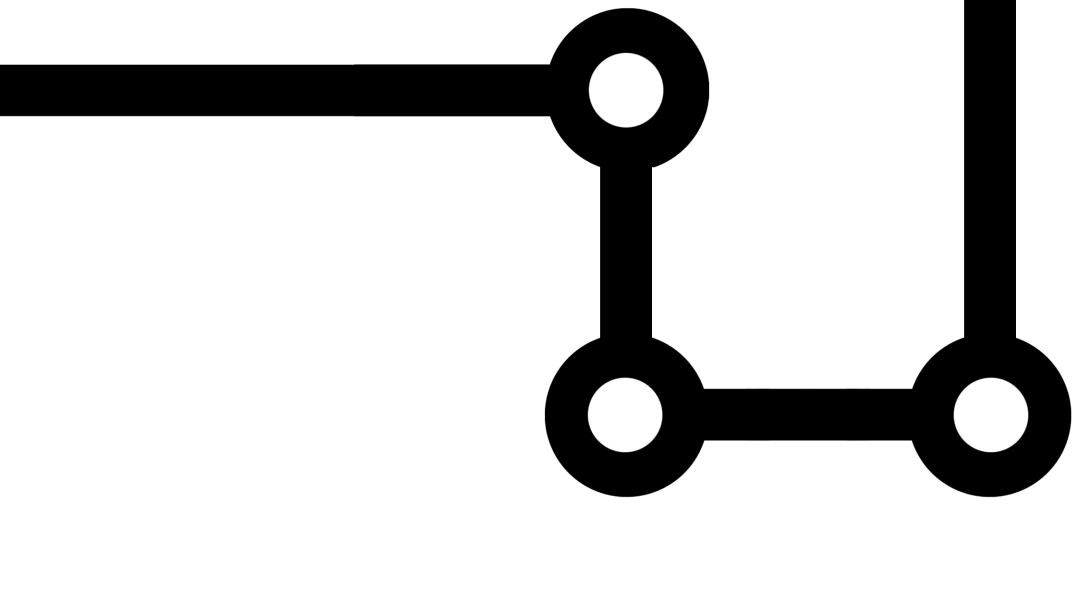
— Antonia Majaca and Luciana Parisi, "The Incomputable and Instrumental Possibility", *e-flux* journal, n. 77, November 2016.

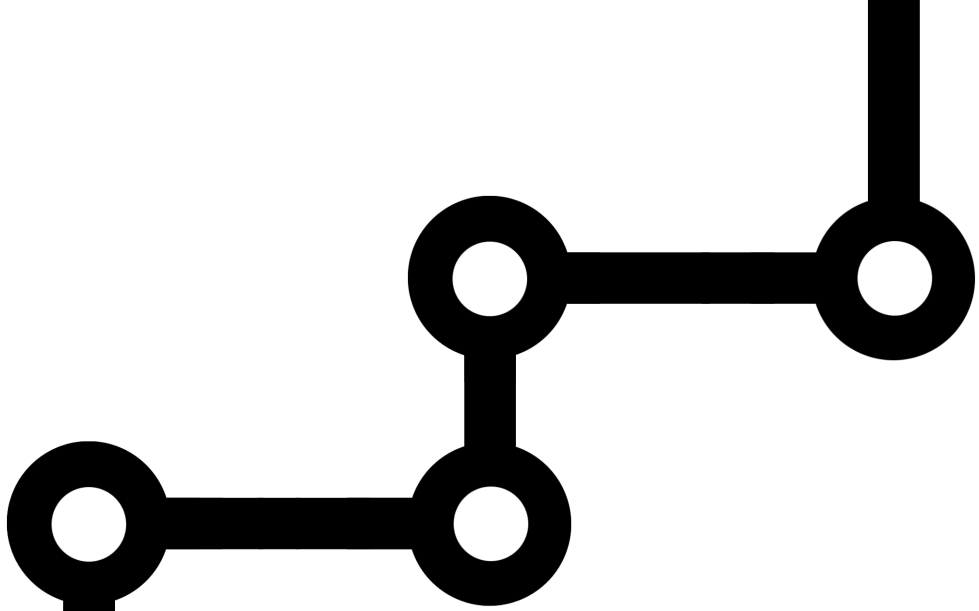
"In almost all cases, women are centered as the subject of concern; rarely are men given the same attention, even though male-dominated environments are a topic of frequent discussion in such studies. Centering the role of culture, this research suggests that a student's self-assessment of whether they are a good fit for the field is likely to influence whether they will leave computing and is intertwined with stereotypes of computer scientists as singularly focused, asocial, competitive, and male."

— Kate Crawford et al., "Discriminating Systems: Gender, Race, and Power in AI", New York: AI Now Institute, 2019.

"While studies of race in cyberspace are still relatively rare, studies of whiteness in cyberspace are vanishingly so."

— Lisa Nakamura, *Digitizing Race: Visual Cultures of the Internet*, Minnesota: University of Minnesota Press, 2007.





6. FUTURE FEMİNİSMS YET TO COME
NEW ALLİANCES İN THE OUTER SPACE

"The Oankali had removed her so completely from her own people—only to tell her they planned to use her as a Judas goat. And they had done it all so softly, without brutality, and with patience and gentleness so corrosive of any resolve on her part. [...] "Down on Earth," she said carefully, "there are no people left to draw lines on maps and say which sides of those lines are the right sides. There is no government left. No human government, anyway."""

— Octavia Butler, *Dawn: Xenogenesis*, New York: Warner Books, 1987.

"If posthumanism is to be a successful political project, the xenofeminist claim is that we must intersectionalize the once-parochial universal, and remake it for ourselves and for our alien kin."

— Helen Hester, "Xenofeminism", *Posthuman Glossary*, London: Bloomsbury Academic, 2018.

"Afrofuturism operates at the intersections of history, speculation and performance – within modes of potential – to develop a methodological immediacy that combines the speculative sufficiency of fantasy, fiction, performance and other technocultural reflections with historical modes of sufferings and displacements. The purpose is to imagine new relational frameworks. In a way, Afrofuturists seek to understand where the black body ends and representation begins; and how the imposition of historical circumstance emerges as a politics of present and future collective belonging."

— Ramon Amaro, "Afrofuturism", *Posthuman Glossary*, London: Bloomsbury Academic, 2018.

The seminar "Women in Computation" took place during the summer semester 2019. It provided a historical introduction to feminist theory and to its intersection with natural sciences and information technologies in the 20th century, discussing, among others, the genealogy of notions such as cybernetics and cyborg.

The foundation for the course was built on the historical and yet invisible role that women and their labour practices have played in the development of computer technologies, such as during the industrial revolution, during WWII and in the development of the first mainframe computer ENIAC in the United States. The displayed exhibition is the result of collective research to "write women back into the history of computation they were always part of" (Jennifer S. Light).

The project presentation is a collaborative work by students Ulrike Barwanietz, Vanessa Bosch, Emma-Lilo Keller and Carmen Westermeier. The seminar was organised by Ariana Dongus and Prof. Dr. Matteo Pasquinelli.

Illustration: Etienne Gilfillan, from Rebecca Pohl, *An Analysis of Donna Haraway's Cyborg Manifesto: Science, Technology and Socialist-Feminism in the late Twentieth Century*, Macat Library, New York: Routledge, 2018.