0. Introduction

The rise of computing, like so many other things in the modern world, could arguably be dated to the aftermath of the French Revolution. The embryo of software programs is a system of perforated cards used in the Jacquard loom and first exhibited in 1801. Joseph-Marie Jacquard’s device was the culmination of a series of inventions made during the course of the eighteenth century in the silk-weaving district of Lyon. The principal idea which he borrowed from earlier designs was the use of perforated cards to steer the loom. The movements of the machinery pushed the cards against a set of rods. If a card was pierced the rod could pass through the hole. Thus a thread in the loom was lifted which allowed the shuttle to slip under the thread. If there was no hole in the card, conversely, the rod bounced back and the thread stayed down. The presence or absence of a hole could be said to represent the binary ‘one’ and ‘zero’ of the modern computer. In this way, complex textile patterns were stored in stacks of punch cards.¹ Up till then it had taken great skill of the weaver to produce luxury fabric. Not only did the weavers stand to lose their mastery in the craft. The Jacquard loom could be operated by a single weaver without the help from a drawgirl. The prospect of getting rid of the drawgirl was a strong inducement to master weavers for supporting innovations in the field.² Hardly any family in the city of Lyon were unaffected by the invention. The weavers responded promptly by wrecking the machinery. They discovered that by throwing their wooden shoes into the loom the mechanics could be grind to a halt. We might elect to call it the first Denial-of-Service attack in history.³ Hence, the birth of sabotage was coincident with the first computerisation of a workplace.

Throughout the nineteenth century, the textile industry was a major theatre for labour conflicts over technological development. The most famous of these clashes, the Luddite uprising, consisted of combers, weavers, and artisans in the wool and cotton districts of central England. At the time of their rebellion,

³ Denial-of-Service is a method to close down a computer network by overloading it with requests.
culminating in 1811-1813, the Jacquard loom had not yet been diffused to Great Britain. Their attacks were mainly directed against the power loom and related, organisational changes in the trade. Luddites conducted nightly raids to smash wool mills and weaving frames and their operations were commanded by the fictive ‘general Ludd’. The English crown had to deploy 14,400 soldiers in the region to crush the nightly insurgencies. Quite remarkably, more English soldiers were mobilised against the Luddites than had been sent to Portugal four years earlier to face Napoleon’s army. Still, given the resources and logistics commanded by the state and the capitalists, the workers had very limited chances of mounting a challenge to the emerging capitalist system. A crucial weakness of the Luddites was that they lacked the means to develop a positive technology of their own. They could only rely on their mastery in old technologies against the innovations and the scaled-up economy imposed by capital. Thus their struggle against capitalist restructuring acquired a don Quixotesque flavour that has today become the meaning of the word “luddite”. 

Given the technophobia commonly associated with “Luddism”, it is not clear that Luddites would be the ancestors of techno-savvy hackers. Nevertheless, what they have in common is that they are both caught up in the web of the same social forces and are fighting on the same contested terrain, the terrain of technological development. The main difference between Luddites and hackers is that the later have a technology of their

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6 Even if machine breaking could not stop industrial capitalism, Eric Hobsbawm estimated that the implementation of labour-saving technologies in local areas was held back due to sabotage. Furthermore, the breaking of machines was part of a more general strategy of ‘collective bargaining by riot’, as he called it, which could also include arsoning the employer’s stock and home. If judged as a method to maintain wage rates and working conditions, it was fairly effective. Eric Hobsbawm, “The Machine Breakers”, Past and Present 1 (February 1952).
own to draw upon. The universally applicable computer run on free software and connected to an open network, all of its achievements continuously fought for by the hacker movement, have in some respects levelled the playing field. Through the global communication network, hackers are matching the coordinating and logistic capabilities of state and capital. The conviviality of free software tools made by hackers is not accidental. It boils down to their alternative model for organising labour relations. The novel approach to arranging labour power is the chief accomplishment of the Free and Open Source Software (FOSS) movement. In hacking, a new subjectivity is taking shape around a voluntarily entered, collective labour activity. When hackers are asked what motivates them to write free code or crack computer systems their answers are many and diverse. A recurrent theme, however, is the thrill they get from doing it.\(^7\)

The notion of hackers becoming revolutionaries just for fun would have appealed to the eighteenth century poet Friedrich Schiller. Disappointed by the failure of the French Revolution, he sat down to ponder over how to make it work better the next time. Friedrich Schiller saw the ‘aesthetic play-drive’ as the primary force which could foster a more wholesome human being, whose maturing would also carry forth and be able to sustain a post-revolutionary aesthetic state. Schiller meant that the aesthetic education of man was necessary to heal the rift within man caused by specialisation: ‘[…] If man is ever to solve that problem of politics in practice he will have to approach it through the problem of the aesthetic, because it is only through Beauty that man makes his way to Freedom.’\(^8\) Both adherers and critics of Schiller have pigeonholed him in the tradition of romanticism. Marxist scholars have followed Marx’s lead and passed over Schiller’s work as a footnote in German, idealist philosophy, with the notable exception of Herbert Marcuse. He declared his indebtedness to Schiller for his own life-long investigation into the liberating potential of aesthetics and play. Marcuse insisted on play as a constitutive praxis on parity with labour. His take on play, where it is set next to labour, allows us to reassess the legacy of Friedrich Schiller as a political theorist. His philosophy must be reclaimed from the fine art scene and high-browed poetry. It would do Schiller more justice if his words were

\(^7\) The joy of writing source code is the lead motive in Linus Torvald’s story about the invention of Linux. Linus Torvalds and David Diamond, *Just For Fun – The Story of an Accidental Revolutionary* (New York: HarperCollins Publisher, 2001); hereafter cited in text.

applied to the politics that flows from the ‘beauty of the baud’ and the play with source code in the computer underground. Hackers are picking up the war cry of the rave movement: ‘we make joy a crime against the state’. This strategy will be discussed under the label ‘play struggle’ and it is the main topic of the book. The term play struggle is meant to highlight its closeness with labour struggle. Similar to labour in that it is a productive engagement with the world, play differs in that it is freely chosen and marked by a high degree of self-determination among the players. At its heart, the politics of play struggle consists in the distance it places between doing and the wage relation. Play is a showcase of how labour self-organises its constituent power outside the confines of market exchanges.

It is more than a little ironic, or perhaps, highly consistent with the dialectic dramaturgy of our tale, that this potential first arises in the field of computers – historically speaking the very anti-thesis of labour autonomy. A red thread runs from the hole cards devised by Joseph-Marie Jacquard to deprive weavers of their craft skills, to the writings of Charles Babbage, the distinguished forerunner of modern computer science. He envisioned the world’s first computer, the Difference Engine, and incorporated Jacquard’s punched card system in his second attempt to build a computer, the Analytical Engine. These machines were intended to replace the personnel, at the time known as ‘computers’, who were then employed to calculate mathematical tables. In addition to figuring out the principles of computing, Charles Babbage was also a pioneer in writing management literature. In *On the Economy of Machinery and Manufactures*, published in 1832, he advised factory owners how to break up the labour process into simple tasks that could be operated by workers with the least possible skills. His deep understanding of technology did not fail him when assessing the expediency of machinery on the factory shop-floor: “One great advantage which we may derive from machinery is from the check which it affords against the inattention, the idleness, or the dishonesty of human agents.”

Charles Babbage’s words inadvertently point to the antagonist relation between labour and capital that computing has grown out of. The computer makes the ‘machinery check’ against human agents surgical in its precision. Furthermore, software-mediated machinery checks are now being exported from the factory to the whole of society. Through so-called Digital Rights Management (DRM) technology, the behaviour of workers, consumers, and citizens are increasingly regulated by software code. And yet, human agents persist...
in haunting the computerised network – the spectre of hacking. Karl Marx made a well-known allegory between class struggle and the mole. It disappears beneath the earth for long periods of time only to reappear again at an unexpected time and place. Capital’s strategy to subdue labour conflicts with machinery and computers has merely resulted in the mole respawning on the Internet. Charles Babbage’s endorsement of machinery as an instrument of control is diametrically opposed to how a hacker from the Hacksec group assesses the great advantage which we may derive from technology: “So that is the spirit to be able to take these components, to put together the technology that was the domain of governments and let the average person figure out how to use it. That is the promise of technology.”

The promise of hacking is that, by making computer technology accessible to non-professionals, it undermines the social division of labour as the regulating principle for technological development. In plain language; corporate and government institutions have lost their monopoly over research and development. Concrete political results follow when decisions over technology are spread to the crowd. The mass defection from the intellectual property regime in filesharing networks, the challenge posed by the free operating system GNU/Linux to Microsoft’s dominance over the computer desktop, and the circumvention of state censorship and surveillance on the Internet, all hinges on that the tools and skills for writing software code are made public by hackers. This emancipatory promise contradicts the association regularly made between cyber-politics and high-tech libertarianism. Occasionally, the potential of hacking for progressive and radical change has been acknowledged by public commentators. Readers of New York Times were in 2000 confronted with the proclamation that the communist republic now existed on the Internet. The journalist Andrew Sullivan made the point that dot-communism had sprung up in the heartland of the most advanced capitalist country of our time, America, just as Karl Marx had predicted. Similar ideas have been voiced by the Slovenian philosopher Slavoj Zizek. In a paraphrase of Vladimir Lenin’s famous endorsement of electricity, Zizek exclaimed in a tongue-in-cheek way that: “socialism = free access to the Internet + power to the soviets”. Sporadic allusions to the Communist Manifest are frequent within the computer underground. The

10 Jason Scott, BBS the Documentary (2004).
most renowned insider drawing parallels between Marx and the hacker movement is Eben Moglen. As the pro bono general counsellor for the Free Software Foundation, an influential organisation of hackers, Eben Moglen is well accustomed with the practice of hacking. He is convinced that capitalism will be brought to an end by a tide out of which hacking is just the first wave.\textsuperscript{13}

Concurrently, a range of antagonists to the FOSS movement have accused GNU/Linux and alternative licensing schemes for being un-American, subversive, and cancerous. Bill Gates caused a stir when he declared that the people behind FOSS and Creative Commons licenses are “new modern-day sort of communists”.\textsuperscript{14} Even as multinational corporations move in to invest in hacker projects, they do so while adding to the rebellious gloss. For example, when IBM vowed to spend one billion dollar on FOSS development, they marketed their engagement in a public campaign under the slogan: “Peace, Love, and Linux”.\textsuperscript{15} In this case, as in many others, the revolutionary vocabulary is merely an eye-catching stunt.

Opponents to the FOSS movement apply the same rhetoric to brand free software as Stalinist. No deeper understanding can be expected to come out of either endeavour. But there are serious attempts too at using critical theory to analyse the emergence of free software. The Oekonux project based in Germany, the Dutch group behind the Nettime discussion list, the predominantly Spanish-speaking initiative by the name Hipatia, and hack-labs in Italy and South-America, are examples of such outposts of reflection taking place inside the hacker movement. In the traditional left and in academia, however, indifference and suspicion has been the predominant attitude towards the subject for a long time.\textsuperscript{16} Throughout the 1980s and 1990s, Marxist scholars

\textsuperscript{13} In “The DotCommunism Manifesto” Eben Moglen directly paraphrases Karl Marx’s manifesto. emoglen.law.columbia.edu/publications/dcm.html (accessed 2007-02-08).

\textsuperscript{14} “Gates Taking a Seat in Your Den” CNet News.com (January 5, 2005).

\textsuperscript{15} For a less cosy account of IBM’s political legacy, see Edwin Black, IBM and the Holocaust: The Strategic Alliance Between Nazi Germany and America’s Most Powerful Corporation (London: Little, Brown & co, 2001). IBM’s modern-day political stand can be read out from their donations to George Bush’s presidential election campaign in 2000 and 2004, hardly an administration associated with the old hippie slogan.

\textsuperscript{16} In his essay on a socialist theory of mass media, Hans Enzensberger complained about the disinterest
were preoccupied with demystifying the hype and vulgarities of post-industrial ideology along with the many unwarranted hopes attached to information technology and the Internet. Progressive academics are concerned about electronic surveillance, intensified deskilling of workers due to microprocessors, big business lobbying for global enforcement of intellectual property monopolies, and the Goliath-scale acquisitions by media corporations, all trends that seem to run in consistency with Internet’s roots in Pentagon’s nuclear warfare strategies.¹⁷

Though these perils are very real, this book will investigate capital’s bid to commodify information from a different angle altogether. The intellectual property regime should be read out as a ‘negative shape’ in the struggle of hackers. Hacking is the prism through which the book moves outwards to look at intellectual property law, computing, the Internet, and networked capitalism in general. It is the restructuring of capitalism and the possibilities of resisting it that is at the heart of our discussion. The critique is made from a general Marxist theoretical viewpoint. Marxism, however, is as multifaceted as the many topics covered in the book. In order to unravel hacking, we have to cross through innumerable controversies, positions and hypotheses, taking issue with camps within the hacker movement, reformist intellectual property critics, among progressives in the topic:

"If the socialist movement writes off the new productive forces of the consciousness industry and relegates work on the media to a subculture, then we have a vicious circle. For the Underground may be increasingly aware of the technical and aesthetic possibilities of the disc, of videotape, of the electronic camera, and so on, and is systematically exploring the terrain, but it has no political viewpoint of its own and therefore mostly falls a helpless victim to commercialism.” Hans Enzensberger “Constituents of a Theory of the Media” in ed. John Hanhardt, Video Culture – A Critical Investigation (New York: Virtual Studies Workshop Press: 1986), 103; hereafter cited in text.

mainstream economic theory, as well as different schools within the Marxist discipline. This is reflected in the style of writing. The argument in the book progresses by a method of triangulation, closing in on the subject from several different angles at once. Few self-described hackers will recognise themselves in the result. Were we to judge the politics of hacking by an opinion poll among the members of the hacker movement, we might have concluded that hacking is predominantly apolitical, and possibly with a bent towards liberal, voluntarist ideology. Appearance to the contrary, however, this book is not a historical or anthropological account of the FOSS community. What concerns us is not ‘hackers as a noun’ but ‘hacking as a verb’. Hacking is emancipatory to the extent that it opens up the practice of intervening in computer technology to a non-denumerable mass of people. In other words, its politics consist in that decisions over technological development escape from being confined to either professions or/and subcultures. This potential of hacking is set back not only by intellectual property law, knowledge monopolies, and black box designs, but also by identities excluding outsiders. The hacker movement is interesting to study in so forth that it helps us to understand the praxis of hacking. Our ambition is not, though, to explain the FOSS movement with Marxist theory, but to take hacking as a departing point when reviewing Marxist theory in relation to networked capitalism.

The controversy that has captivated Marxist scholarship in recent years is the standoff between followers of Empire, the post-modern, anti-capitalist best-seller by Michael Hardt and Antonio Negri, and traditionally oriented Marxists. At stake is the question of how to revise Marxism and bring it back to the centre of public debate and scholarly thinking. It is a theme that will run in parallel throughout the book. The struggle of hackers provides a good reference point for casting new light on theoretical positions on labour, struggle, and technology. Some characteristics of the hacker movement are at odds with assumptions held in classic Marxism. The failure of hackers to conform to established classifications has surely contributed to their invisibility in labour theory up till now. The ideas advanced by Hardt and Negri, and, more generally, by the

autonomist Marxist tradition to which they belong, are at times more successful for explaining the conflicts in the computer underground. In particular, FOSS developers challenge our concept of the nature of labour and the composition of the working class. A key note in this book, recurrent in the writings of many autonomous Marxists, is that the production process has left the direct site of production. There are no clear boundaries any longer between work time and leisure time, between the inside and outside of the factory, and between waged and volunteer labour. The FOSS development model is a parade example of how the labour process has been diffused to the whole of society. One consequence is that the subjective experience of the antagonist relation is muddled. Day-to-day events do not immediately translate into a sharp, bi-polar opposition between employer and employee. A programmer might freelance for a multinational three days a week, spend two days as an entrepreneur of a FOSS start-up venture, and in the meantime he will be a user of software applications, all of which are activities that feeds into the capitalist production apparatus. Given this diversity of labour, Antonio Negri’s longstanding ambition to open up the category of the working class is a valid project. In the best case scenario, it might prevent us from foreclosing emerging, unfamiliar sites of exploitation and struggle. The latest attempt by him and Michael Hardt in redefining the proletariat is the notion of the multitude. They give priority to the multitude as an agent of change, a position otherwise held by the working class in Marxist theory. One complaint about Empire raised by its many critics is the failure of Hardt and Negri to explain who the ‘multitude’ really is. No satisfactory answer has been given by the two authors. For our purpose of analysing the hacker movement, we will instead borrow an idea Negri sketched on during his years in prison. Back then he suggested that a ‘social worker’ had emerged in conjunction with a labour process dispersed to the whole of society. The social worker replaced the ‘mass worker’ of the Fordist factory as the dominant composition of the working class. The concept of the social worker is preferable to the term multitude since it puts emphasis on the continuity with earlier forms of class struggle and industrial conflicts.

Another premise that the reader might recognise as an influence from autonomous Marxism is the stress placed on class struggle. This is particularly forthcoming in regards to a major sticking point in a book about hacking and information systems, namely: How to understand the role of technological development. Antonio Negri, Revolution Retrieved – Writings on Marx, Keynes, Capitalist Crisis and New Social Subjects (1967-83) (London: Red Notes, 1988).
Negri is representative of his tradition when he declares that innovations are capital’s way of coping with working class resistance. It is a counter-intuitive thought that takes some time to get used to. Even so, the direction of causality proposed by Negri can be reasonably substantiated in the case of the computer underground. For instance, the architecture of the personal computer was more or less forced upon IBM by hobbyist computer enthusiasts. Putting emphasis on class struggle is an important corrective to the dejected image of capitalism as an overbearing juggernaut. This must not swing to the other extreme, however, where the ‘pessimism of the will’ is contrasted with an ‘optimism of the intellect’, as happens to some autonomist Marxist writers. Returning to the example above, the dream of hobbyist computer enthusiasts to democratise the computer was realised at the price of an expanded market in consumer electronics. In the end, IBM benefited greatly from selling personal computers. It is hard to think that hardware hackers could have achieved their dream in any other way. Karl Marx stroke a balance between agency and structure in an unsurpassable passage when he stated that men make their own history, but not under conditions of their own choosing. Though this inquiry into the hacker movement borrows from autonomist thinking, in addition to various other sources of inspiration, the book is written from the perspective of a loosely defined tradition of Western Marxism.

The first chapter starts out with providing a background dossier on the struggle of hackers. This is necessary since the public only has previous knowledge of hackers from the biased reporting in mainstream media. But it would be foolish to try to sum up in print a field which changes so fast. The aim is therefore not to ‘provide the dots’ but to ‘draw the lines’. Those lines are running alongside two hundred years of labour struggle. With this perspective, the tale about the hacker movement comes out very differently from how voices within the FOSS community present themselves. In particular, we must be more provisional when assessing the outcome of their endeavours. FOSS licenses might strengthen the position of labour by fostering open standards and free access to software tools. Capital’s strategy of Taylorism is set back by such a computer architecture. It is equally possible, however, that alternative development models involving volunteer labour are in alignment with a restructured, post-Fordist production process. An unfortunate side-effect of free and open licenses might then be intensified exploitation of waged and voluntary labour. Some clues can be had
by analysing FOSS businesses models with Marxist theory.

In the next chapter, the focus on the hacker movement is broadened, both theoretically and historically. Notions about the Information Age, which many hackers tend to draw from when conceptualising Internet-related issues, are contrasted with Marxist theory. It is argued that post-Fordist restructuring of the labour market provides a better backdrop against which we can assess the role of computer networks and digitalisation. This perspective calls into question many of the assumptions held in the computer underground, for instance, the willingness to attribute historical change to technology and the unique properties ascribed to information. Against those beliefs, it is contended that digitalisation originates in the antagonist relation between labour and capital. Infinite reproducibility of digital information means the same thing as infinitely replaceable labour. With a simple ‘copy-and-paste’, a given amount of objectified labour is instantly duplicated. Marxist theory suggests that this extreme form of automation in the computer sector forces capital to exploit living labour elsewhere in the economy. In the chapter it is proposed that the users have become a major source of surplus value for capital. The enrolment of FOSS communities by corporations is part of a more general pattern in post-Fordist capitalism where audiences and users are ‘put to work’.

The third chapter is concerned with the commodification of information, and, more to the point, the commodification of the labourers producing information. In the final analysis it is the freedom of living labour, not the freedom of information, which is our concern. Commodification of labour occurs when a subjectivity of individual authorship is fixated over the labour process. In her function as an author the individual puts her efforts into producing commodities for a cultural market. But the fixation of individual authorship is constantly under challenge. In mainstream media the violations against intellectual property on the Internet are typically framed as a consumer revolt. With this interpretation the main issue becomes the price of information content. We will argue that the surge of filesharing networks is part of a more radical upheaval. Defiance against copyright law, the advancement of an open technological platform, and the assertion of the right to share information freely, are rejections of the commodity form as such. The
individual author is under threat to be dissolved into the anonymous, ambulant, and playful authorship of user collectives.

Chapter four moves on to look at hacking from the perspective of consumption and satisfaction of needs. The hacker movement, like other subcultures, is intimately related to a consumer-driven capitalism. It is argued that, on one hand, the provision of material needs have enabled people to engage in hacking, and, on the other hand, people are motivated to do so because of the dearth of non-material needs in consumer society. Boredom with commodity relations, both in work and in consumption, is the driving force. It is boredom that points beyond the endless game of conspicuous and semiotic consumption. A categorical renunciation of consumer society will not do, however, since the resistance draws its resources from the same society. Without markets in consumer electronics there would not be a hacker movement. Parallels can be drawn between hacking and the subversion of commercial messages and goods by consumers. Studies of consumer resistance are often associated with the tradition of cultural studies. Labour theoreticians have reproached the cultural studies discipline for making too much out of the rebellion by consumers. They rightly insist that a serious challenge against capitalism can only be mounted from inside production. Our argument here is that interesting things start to happen when consumer goods are taken by users as the departing point of a new cycle of production. Crucially, this cycle of consumption-production is disjointed from capitalist circulation. User-centred production models stand a good chance of outdoing markets in the provision of social needs. The reason is simple; it was the failure of markets in satisfying those needs that motivated users to side-step market relations in the first place.

Thus we are led over to the topic of the fifth chapter, production. The case is made that the success of the FOSS development model over proprietary software development is an important cursor. It tells us about the inadequacy of capitalist relations in organising labour in the information sector. The justifications for property based research have little support in economic history, it is contradicted by empirical data, and it cannot even be convincingly argued in theory. The shortcomings of the proprietary development model translate into advantages for user-centred innovation models based on less strict license schemes. A
paradoxical series of events have brought about user empowerment. We trace it to the termination of craft
tools and skills are cheapened and spread from the capitalist production site to the whole of society. Arguably, the means of production are being re-appropriated by the proletariat in this way. It should be kept in mind, however, that user-centred innovation models are enrolled in capital’s valorisation process. Capital might have lost its monopoly over the means of software production, but it has other methods to discipline the ‘user force’. It can rely on its control over circulation, and, if worst comes to worst, fall back on the state.

The sixth chapter approaches hacking from the perspective of circulation. Our discussion connects back to the century-old dispute between market liberals and state socialists on the most efficient method for distributing resources in society. The advent of filesharing networks has actualised the question if there could be a third way of allocating information resources, different from both markets in information and state planning. That model might be called an information commons, or, what amounts to the same thing, a high-tech, anarchistic gift economy. Hackers have borrowed the concept of a gift economy from anthropology in order to describe the economic activities in the computer underground. It goes without saying that gift economies in tribal societies and the giving of information on the Internet are essentially different. At a closer inspection, we will find that filesharing networks are hybrids that combine the impersonality of market exchange with the non-coerciveness of gift giving. It is thus we can envision a third method for allocating resources.

The final chapter returns to the core argument of the book, that hacking is a showcase of play struggle. This struggle is at its heart a reaction against alienation. However, the resistance of hackers looks nothing like the kind of struggle we know from industrial conflicts. Instead of confronting the wage relation heads on, in strikes, sabotages etc., it attacks alienated labour by circumventing it. A different labour relation is being invented in FOSS development projects. The label ‘play struggle’ is merited because those relations are essentially played out. The utopian hopes of Friedrich Schiller and Herbert Marcuse are contrasted with the
current development in the computer underground. The chapter reviews scholarly definitions of play, and
calls attention to ludic forms of resistance against the factory discipline previously in history. The triviality
commonly associated with play fits together with that the activity is non-instrumental. In contrast, the
development of technology is archetypical of an instrumental, human activity. The hacker movement has
submitted the development of computer technology under a model determined by the play-drive. That can
hardly be called trivial.