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Algorithmic Exploitation of Ride-Hailing Drivers' Right to Rest under Platform Incentive Mechanisms

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Abstract: *This paper reveals the implicit exploitation of ride-hailing drivers' right to rest through platform algorithmic mechanisms. Platforms present explicit incentives such as dynamic pricing and order-completion bonuses, while employing service score algorithms to quantify drivers' labor into controllable data. This compels drivers into a self-exploitative state where they trade rest for higher income. Drivers' working hours and withdrawal rules are manipulated by algorithms: high-price time slots induce excessive order-taking, and delayed withdrawal systems tie cash flow to continuous labor, intensifying economic dependency. Through data monopolies, platforms construct supply-demand profiles and use information asymmetry and psychological tactics to reduce drivers to mere algorithmic instruments. The study points out that measures such as algorithm transparency, flexible order limits, and withdrawal system reform are needed to balance platform efficiency with labor rights, safeguard fairness in the digital economy, and prevent technological power from eroding the autonomy of workers.*

Keywords: *Ride-Hailing Drivers, Right To Rest, Algorithmic Exploitation, Algorithmic Management*

1. Research Background and Problem Statement

The Report of the 20th National Congress of the Communist Party of China proposed supporting and regulating the development of new forms of employment, and strengthening the protection of the rights and interests of workers in flexible and emerging employment types. Against this backdrop, new employment forms based on online service platforms are becoming a major trend in flexible work. Increasing numbers of digital gig workers rely on platforms to realize self-worth and gain economic returns. However, online service platforms driven by algorithmic systems still present numerous issues in managing workers in these new employment types. For instance, phenomena such as "food delivery riders trapped in the system" have attracted widespread attention and discussion, with high turnover rates persisting among gig workers on these platforms.(Sustainable Development Survey Report on Food Delivery Riders [R]. Beijing News, November 2020. The report indicates that the annual average turnover rate among delivery riders reaches 48.2%.)

In recent years, the platform economy, represented by ride-hailing services, has reshaped traditional employment forms and become a key channel for flexible work. However, while this "new employment" model brings convenience, it also reveals deep-seated contradictions in labor rights protection—particularly the issues of excessive working hours and the absence of rest rights for ride-hailing drivers. According to case data and offline interviews conducted by the research team, drivers typically work more than 10 hours a day, with some reaching up to 12 hours—far exceeding the labor intensity standards of traditional industries. Behind this phenomenon lies not only the helplessness of individual drivers forced into "involution" for survival, but also the complex contest between platform algorithm mechanisms and regulatory policies.

A study by the International Labour Organization indicates that algorithmic systems impose various pressures on employees, including increased work intensity, algorithmic discrimination and bias, mental and physical stress, income instability, organizational control, and privacy monitoring. [Sustainable Algorithmic System.(Sustainable Algorithmic System [R]. International Labour Organization. Available at: https://www.ilo.org/publications/sustainable-algorithmic-systems)The question "How can one escape the system?" has become a central issue in the relationship between ride-hailing drivers and online service platforms.

Meanwhile, the international community has also started to respond to the challenges posed by algorithmic labor management. For example, California's Assembly Bill No. 5 (AB5), enacted in 2020,

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reclassified many gig workers as employees rather than independent contractors, thereby extending traditional labor protections such as minimum wage, overtime pay, and rest breaks to ride-hailing drivers. Although companies like Uber and Lyft counteracted this policy through Proposition 22, the legal and public debates have catalyzed greater scrutiny over algorithmic labor practices in the United States.

In the European Union, the Digital Services Act and the upcoming Platform Work Directive emphasize algorithmic transparency and the right to human oversight in automated decisions. These policy frameworks reflect a growing recognition of the need to balance digital innovation with worker protections, especially in contexts where algorithmic incentives blur the line between autonomy and control. In particular, the EU proposal mandates that platform workers receive clear information about how automated systems influence their working conditions, performance evaluation, and earnings.

These global legislative efforts offer comparative perspectives that highlight the current regulatory gaps in China's platform economy. While China has taken initial steps—such as the Ministry of Human Resources and Social Security's 2021 guidelines on protecting the rights of flexible workers—there remains a lack of enforceable rules specifically targeting algorithmic management practices. In this context, the Chinese experience with ride-hailing drivers presents a valuable case study for understanding how unregulated algorithmic incentives can erode basic labor rights such as the right to rest.

The core question this paper seeks to answer is: How do ride-hailing platforms' algorithmic incentive mechanisms use explicit incentives to obscure implicit controls, thereby exploiting drivers' right to rest? By analyzing the external manifestations of driver labor alienation and the logic of algorithmic exploitation, this study reveals the power imbalance between platforms and workers in new employment forms, and proposes corresponding solutions.

2. External Manifestations: Labor Alienation of Drivers Under Algorithmic Rules

2.1 Long Working Hours

Platforms bind drivers' work intensity directly to their earnings through algorithmic rules, forming an implicit system of coerced labor. In labor dispute cases involving ride-hailing drivers, court documents commonly reveal that drivers' average daily working hours far exceed the legal standard of eight hours. Some group cases even include platform driver handbooks explicitly requiring that drivers "stay online no less than 10 hours per day." On the surface, such rules claim to ensure adequate transportation capacity, but in practice, they use service score algorithms and dynamic pricing mechanisms to compel drivers to work longer hours. For instance, the service score algorithm quantifies behaviors like acceptance rate and cancellation rate into a scoring system. Drivers with low scores are demoted in dispatch priority, forcing them to stay online longer to improve scores and maintain income.

In ride-hailing platforms, the matching between drivers and passengers is highly random and temporary. Drivers begin work only after matching with passenger demand through the platform app and stop work once the task is completed. The intervals between tasks are intermittent, which manifests in two aspects: First, drivers and specific passengers do not establish a continuous or fixed employment relationship. Second, drivers and the platform company do not formally maintain a stable employment relationship either. According to platform rules, service providers are considered to be in cooperation with the company only during the duration of an active order. The uncertainty in time gaps between different tasks—ranging from minutes to hours or even days—means that on-demand matching is inherently intermittent in terms of time[1]. In offline interviews, many drivers reported that the algorithm minimizes the time between orders, and to secure the next assignment, they must stay in a prolonged state of "roaming standby." This further exacerbates the involuntary extension of their working hours.

2.2 Irregular Driving Hours

Drivers' choices regarding when to go online and start driving are not based on personal preference, but are manipulated by a dual mechanism of algorithmic rules and incentive structures. Research shows that drivers' working hours are highly polarized: some concentrate on morning and evening peak periods (e.g., 7:00–10:00 and 17:00–20:00) to match the platform's dynamic pricing and high-fare

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windows; others opt to work at night or on holidays to secure higher order prices; and a third group stays online for extended periods in order to complete platform-set "order completion bonuses."

Some drivers have reported that platforms increase fare rates up to three times during specific periods (such as New Year's Eve) to induce overnight driving, which indirectly exposes the algorithm's covert control over driving schedules. The order completion bonus mechanism, through its rule of "completing a specified number of orders within a limited time frame," effectively transfers the power of time selection from the driver to the platform. Drivers must densely accept orders within the time window set by the platform, or they will forfeit the bonus. This design essentially fragments drivers' working hours into algorithmically adjustable "pieces," compelling them to abandon regular rest in order to match the platform's supply-demand fluctuations.

2.3 Irregular Withdrawal Timing

During offline interviews, some ride-hailing drivers openly stated: "On Didi, withdrawals are processed the next day. When I drove for Gaode before, it was once a week, usually on Tuesdays." None of the interviewed drivers reported access to instant withdrawal. Some platforms even impose withdrawal thresholds or require proof of continued labor activity on the day of the withdrawal—meaning drivers must still be actively accepting rides for the withdrawal to proceed.

These interviews reveal that platforms use delayed withdrawal and threshold settings to deeply bind drivers' cash flow to continuous labor. Most platforms adopt "next-day" or "weekly" withdrawal systems, and some require real-time detection of order activity on withdrawal days, forming a closed-loop dependency of "work—withdraw—work again." This design essentially leverages drivers' anxiety over cash flow, coercing them into sacrificing their right to rest in exchange for short-term income. Moreover, withdrawal thresholds (e.g., minimum withdrawal amounts) further reinforce labor stickiness: if a driver stops accepting orders midway, any accumulated but unwithdrawn earnings may become "invalid" due to not meeting the threshold—forcing drivers to synchronize their work cycles with the platform's withdrawal cycle.

2.4 Physical and Mental Health Impacts

Beyond irregular working schedules and financial dependence, the algorithmic structure of ride-hailing platforms imposes significant physical and psychological burdens on drivers. These health-related impacts are not merely individual consequences but systemic outcomes of continuous algorithmic pressure and labor intensification.

Prolonged exposure to high-intensity work environments without adequate rest increases the risk of fatigue-related health issues. According to medical research, extended driving hours—especially beyond four consecutive hours—are closely linked to reduced reaction times, impaired decision-making, and elevated risks of traffic accidents. Drivers often report symptoms such as chronic back pain, visual fatigue, and disrupted sleep cycles due to their inability to take regular breaks. These physical problems are compounded by the need to remain in "online standby mode," leading to extended sedentary behavior and irregular meal times.

Psychologically, drivers experience elevated levels of stress, anxiety, and emotional exhaustion, especially during peak periods when dynamic pricing and order bonuses encourage aggressive competition. Offline interviews conducted by the research team reveal that many drivers feel a constant sense of uncertainty and pressure to remain online. One driver remarked: "Even when I'm not driving, I'm constantly checking the app—I'm afraid of missing a high-fare ride." This sense of hyper-vigilance reflects a state of algorithm-induced cognitive overload.

Additionally, the lack of interpersonal interaction and social isolation inherent in ride-hailing work amplifies feelings of loneliness and marginalization. Unlike traditional employment settings, where workers engage with colleagues and supervisors, platform drivers operate in a fragmented, digitally-mediated environment. Without institutional support or peer solidarity, drivers are left to bear the mental toll of algorithmic exploitation alone.

The cumulative effects of these physical and psychological pressures create a feedback loop in which deteriorating health undermines drivers' ability to maintain high performance, which in turn subjects them to algorithmic penalties—such as reduced dispatch priority or bonus disqualification. Thus, the right to rest is not only denied in practice but penalized through invisible algorithmic disincentives. These hidden costs must be taken into account when evaluating the fairness and

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sustainability of platform labor models.

3. Fundamental Analysis: The Systemic Logic of Implicit Algorithmic Exploitation

3.1 Algorithmization of Labor Intensity — Quantifying Behavior into Controllable Data

The platform's algorithmic rules are not merely tools for pricing; they are a systematically designed mechanism that transforms labor behaviors into computable data variables. Through technological means, drivers' actions, efficiency, and even psychological states are incorporated into an algorithmic framework to enable precise control over the labor process.

At its core, the service score algorithm is a form of "digital grading." Platforms use a range of indicators—such as acceptance rate, cancellation rate, and passenger ratings—to assign real-time scores to drivers. The higher or lower these scores are, the more they directly determine the priority of order dispatch. On the surface, this mechanism appears fair, but it actually hides a one-sided form of exploitation against ride-hailing drivers. Drivers are not privy to the details of the scoring system—such as deductions for "other conditions"—nor can they predict the specific impact of actions like rejecting distant orders. For instance, when a driver cancels an order due to fatigue, the platform's algorithm mechanically deducts points without considering health needs, reducing their chances of getting future orders. To maintain a high score, drivers are forced to take more orders and stay online longer, sacrificing rest, and entering a vicious cycle of "higher score — greater work intensity — even higher score," ultimately leading to self-exploitation.

In addition to service scores, dynamic pricing and order bonus mechanisms also draw drivers into deeper self-exploitation under the guise of incentives. While dynamic pricing is ostensibly based on supply and demand adjustments, in reality, it serves as a tool for the platform to fine-tune supply by manipulating driver behavior, without accounting for their time costs. Order completion bonuses go a step further by assigning "time-limited order quotas," binding work intensity directly to additional income. This mechanism adopts and "optimizes" the logic of piece-rate wages: to complete tasks, drivers must reduce rest time and increase order frequency, falling into a trap where "the more you work, the more the platform profits, and the more your health deteriorates."

In sum, the ultimate aim of platform algorithms is not to maximize driver welfare, but to optimize supply-demand matching efficiency and platform revenue. Under this goal, drivers' labor is reduced to a schedulable resource. This "resource-ization" fragments labor value into data points, with rest time becoming a disposable variable in the algorithm's optimization process.

3.2 Implicit Control Through Dual-Sided Data Profiling — Asymmetric Power in Supply and Demand Data

The control exerted by platform algorithms is built upon a powerful monopoly over data. Platforms have real-time access to passenger ride-hailing demand, time preferences, and even payment capacity. Using this data, they dynamically adjust pricing and dispatch logic on the driver side. Simultaneously, drivers' order-acceptance habits, online duration, and driving routes are also constantly collected and analyzed. When passenger demand surges, platforms raise prices to attract more drivers; when driver supply exceeds demand, they lower fares or reduce dispatch frequency to cut costs[2].

In this process, drivers' understanding of market demand relies entirely on the data fed to them by platform algorithms. They cannot independently determine when and where it is most efficient to accept orders, nor can they engage in collective bargaining or accurately predict changes to the rules. They are left to passively follow the platform's cues. This information asymmetry turns drivers into mere executors of algorithmic decisions rather than independent market participants.

Under this data monopoly, the coordination of supply and demand is essentially used to transfer market risk onto the drivers. By collecting both passenger demand data and driver behavioral data, the platform constructs detailed user profiles on both ends, allowing for precise algorithmic manipulation of the supply-demand relationship. This ensures that ride-hailing drivers remain in a structurally disadvantaged position within the system.

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3.3 Psychological Dependence and Binding to Continuous Labor — A Strategy of "Voluntary" Exploitation

The implicit control of algorithms extends beyond drivers' physical exertion, such as prolonged working hours, to psychological mechanisms that encourage their active cooperation with platform rules. At the heart of this psychological manipulation is the creation of "voluntary exploitation"—leading drivers to mistakenly believe that excessive labor is a result of their own autonomous choice.

As discussed earlier, ride-hailing platforms typically do not offer instant withdrawal options; instead, they impose delayed withdrawal systems. According to offline interviews, these systems generally require drivers to remain actively engaged in order-taking. In order to ensure the "numbers" in their platform accounts can be converted into actual bank deposits, drivers are compelled to maintain a continuous work rhythm. This design binds labor cycles to withdrawal cycles, creating an inverted logic where drivers work in order to withdraw earnings.

Meanwhile, the randomness of dynamic pricing and temporary reward tasks fosters a "gamification" mindset among drivers [3]. Because they cannot predict when high-paying orders or bonuses will appear, drivers extend their online hours in hopes of increasing their "chances of winning." This uncertainty amplifies their anxiety over opportunity costs—they fear missing out on peak earnings, leading them to voluntarily forgo rest.

Additionally, platforms implement virtual incentive mechanisms such as leaderboards and honor badges, making driver competition visible and tangible. This design exploits social comparison psychology, subtly encouraging drivers to equate rest with laziness or failure. One driver admitted in an interview: "I once made it to second place on the leaderboard, and my income was really high that month. The agency even asked for my income screenshot to show other drivers that the problem isn't lack of money—it's lack of effort." This psychological pressure causes drivers across income levels to internalize the platform's exploitative logic, equating self-worth with work intensity[4].

4. Policy Recommendations and Future Outlook

4.1 Restricting Algorithmic Control — Technological Measures to Effectively Safeguard the Right to Rest

Reasonable limits on order acceptance and mandatory rest periods should not be determined solely by the number of completed orders or fixed time thresholds. Instead, these limits should be dynamically adjusted based on individual differences. Technological interventions can be used to curb the algorithmic control of labor intensity[5]. Scientific evidence confirms that continuous driving beyond four hours leads to fatigue-induced lapses in attention, which is a primary cause of accidents. Platforms can use in-vehicle monitoring systems to track driver status in real time—some existing devices or software are already capable of detecting basic physiological indicators[6]. However, the use of such technologies must be strictly regulated to prevent them from becoming tools of surveillance.

Order limits should remain flexible, allowing drivers to adjust them according to their personal circumstances (e.g., part-time drivers should have lower thresholds). When nearing these limits, platforms should issue soft reminders rather than enforcing rigid cut-offs.

Equally important is the restructuring of incentive mechanisms. "Order completion bonuses," which currently push drivers to sacrifice rest for short-term gains, should be redesigned with health as a core value. For example, platforms could evenly reward drivers who operate during various peak periods, or introduce health points that can be redeemed for insurance or subsidies. These redesigned mechanisms would align platform interests with driver well-being—less fatigued driving reduces accident risk, and higher service quality boosts customer loyalty, ultimately forming a virtuous cycle.

4.2 Promoting Algorithm Transparency — Breaking the Platform's Mechanism of Implicit Control

The "black box" nature of algorithms is a core tool of platforms' implicit control. Drivers' lack of understanding regarding the rules reduces their labor behavior to passive obedience to unknown commands. Therefore, the essence of algorithm transparency lies in transforming vague rules into comprehensible guidelines[7]. Platforms must clearly explain to drivers how dynamic pricing, service score calculations, and reward triggers work—for example, by disclosing the pricing thresholds during

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peak hours or the weightings used in score evaluations. Transparency does not mean revealing trade secrets, but rather ensuring that drivers can make informed choices[8].

Moreover, dynamic adjustments to algorithmic rules should be subject to advance notification. Platforms often revise rules under the guise of "optimization," but the trial-and-error cost is borne by the drivers[9]. To address this, platforms should publish the direction of algorithm updates in advance and provide impact assessment criteria, thereby preventing unilateral changes from undermining drivers' rights and interests.

4.3 Restructuring the Withdrawal System — Effectively Separating the Right to Rest from Economic Dependency

The delayed withdrawal system is essentially a tool for platforms to manage their cash flow. A viable instant withdrawal system must first address the platform's liquidity management needs to ensure financial efficiency. Based on this, a third-party escrow account can be established specifically for holding drivers' earnings, with oversight provided by an algorithm-monitoring platform. On one hand, this prevents platforms from misappropriating funds or using delayed transfers as a means of control. On the other, the algorithm-monitoring platform can dynamically adjust the withdrawable amount based on backend data analysis—allowing for real-time, small-sum withdrawals to meet drivers' daily needs, while applying short audit periods for larger withdrawals to balance cash flow.

Restructuring the withdrawal system helps decouple the right to rest from financial compulsion. When income is no longer dependent on a "continuous order-taking—withdrawal" cycle, drivers can choose to rest without economic pressure. This separation encourages society to recognize rest as a legitimate and necessary component of labor reproduction, rather than a sign of laziness.

4.4 Policy Advocacy and Multi-Stakeholder Governance

To effectively counter algorithmic exploitation and safeguard the right to rest, reform efforts must extend beyond technical adjustments within platforms and engage broader structures of multi-stakeholder governance. A sustainable and ethical platform economy requires the active participation of government regulators, civil society organizations, labor unions, researchers, and the platforms themselves.

First, government regulation plays a foundational role. Existing labor laws need to be adapted to account for algorithm-mediated labor control. Regulatory bodies should mandate that platforms disclose core aspects of their algorithmic management—such as the logic behind service scores and incentive triggers—while establishing enforceable rest standards. These can include mandatory offline hours after long driving periods, or limits on night-time operation, akin to those imposed in long-haul trucking industries.

Second, worker organizations and digital labor unions must be empowered to represent platform drivers in negotiating fairer working conditions. While traditional unions often struggle to organize gig workers due to their fragmented nature, emerging forms of "platform cooperatives" and online driver communities can serve as intermediaries. These groups are well-positioned to advocate for collective bargaining rights, participate in policy consultations, and monitor algorithmic abuses. Experiences in Spain and the Netherlands, where platform workers have engaged in successful litigation and policy reform, offer promising models for bottom-up resistance.

Lastly, independent academic and civic institutions should be enlisted to conduct algorithmic audits and publish impact assessments of platform policies. These third-party evaluations can help uncover exploitative practices hidden in code and generate public pressure for change. For instance, universities and research institutes can develop standardized frameworks for algorithm transparency and labor equity, providing platforms with clear benchmarks.

5. Conclusion

The essence of algorithmic exploitation lies in the erosion of workers' subjectivity by technological power. Platforms achieve this by datafying the labor process, obscuring rules, and refining psychological manipulation—ultimately reducing drivers to the terminal instruments of algorithmic systems. To break this impasse, we must confront the fundamental relationship between power and rights embedded in platform algorithms. This requires not only greater algorithmic transparency and

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regulatory intervention, but also a redefinition of the bottom line of fairness in the digital economy: workers' bodies and time must not be the sacrifices made for algorithmic optimization.

The ultimate goal of a high-performing digital economy should be to serve as a force for inclusive social progress—not as a more insidious tool of modern exploitation. Guiding platform economies toward benevolence, and protecting the right to rest for workers in new forms of employment, will be a long and challenging journey. Yet every reform made in the direction of justice is a solemn commitment to the dignity of labor.

Looking forward, future research could explore how digital governance frameworks—such as algorithmic ethics boards, participatory design models, and cross-border labor coalitions—can further institutionalize protections for platform workers. As the lines between technology and labor grow ever more entangled, the question is no longer whether algorithms will govern work, but how they can be governed justly. As Hannah Arendt once remarked, “The most radical revolutionary will become a conservative the day after the revolution.” The revolution in digital labor must therefore be accompanied by equally radical commitments to democratic oversight, human dignity, and rest as a right—not a privilege.

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