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Algorithmic dwelling? Digital technologies as intermediaries in housing access and the enactment of home

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ABSTRACT

This brief paper provides an introduction to our special issue of the journal on 'algorithmic dwelling'. It provides a summary of the seven papers in the special issue and draws out a number of common themes.

Introduction

This collection of papers originates in a small symposium held at the University of York in the UK in January 2023. The symposium was organised by the authors of this introduction in support of research funded by the Nuffield Foundation which aimed to explore the myriad impacts of algorithmic risk-profiling tools increasingly being used by lenders and landlords in housing markets in the UK. Some of the papers delivered at the symposium are included here. Others were recruited to the cause after the event to provide wider geographical coverage (important research from Australia in particular) and to cover themes pertinent to the issues at hand not otherwise discussed.

The collection hopes to make contributions to a burgeoning research literature that has been variously conceptualised as the study of 'platform real estate' (Fields & Rogers, 2021; Shaw, 2020), 'proptech platforms' (Wainwright, 2023), 'rental proptech' (Maalsen et al., 2024), 'platform landlords' (Nethercote, 2023), 'the internet of landlords' (Sadowski, 2020), 'automated landlords' (Fields, 2022) and other work using similar nomenclature. This literature theorises and empirically explores the way housing markets and the enactment of home are being impacted by the introduction of an assemblage of digital technologies, algorithmic systems and online platforms that increasingly function as crucial intermediaries in a range of processes. Hitherto, the focus of this work has often been on the private rented sector (PRS) but, we argue, and as is reflected in the papers showcased here, many of the issues are cross-tenurial; the PRS may be leading the way

in these developments, but mortgagors and social renters are certainly not immune from their influence. Thus far, and quite understandably, much of this research has found a home in journals and other outlets primarily concerned with geography, housing and urban studies. We contend that the significance of this work is such that it deserves far wider consideration by scholars interested in digitization and algorithmic processes in the round.[1]

Here we have tried to encapsulate these concerns through the notion of *algorithmic dwelling*. We intend this simply as a sensitizing concept designed to foreground the growing importance of digital risk profiling technologies and other algorithmic systems in both providing access to housing (across all tenures) and in constituting what it now means to be at home. Two core questions were posed to the contributors: How do we dwell alongside algorithms? And, how do algorithms intervene in where and how we dwell? The special issue contains seven papers that respond to these questions and flesh out this notion of algorithmic dwelling in various ways.

Articles in the special issue

The first paper – *Home in Cybersymbiosis: Making Home with Digital Oddkin* by Sophie Maalsen – draws on the work of Donna Haraway and Katherine Hayles (amongst others) to offer what the author calls a 'speculative ecology' of our domestic relations with the multitude of computational devices that now inundate (many of) our homes. The paper offers a radical reimagining of algorithmic dwelling in its most literal and embodied sense. The central concept of *cybersymbiosis* encourages us to examine the mutually constitutive relationships that now exist between humans and computational devices in the context of home environments. As we incorporate more digital and algorithmic technology into our homes, our interactions with these devices evolve and shape our living spaces in ways that can alter how those spaces are occupied and how occupiers dwell within them, the results can be both positive and complex. The concept encourages us to consider the dynamic and interconnected nature of our relationships with technology and their implications for how we live our daily lives.

The second paper – *Housing, Debt, and Credit Score Classification Situations: What the Unique 'Situation' of Mortgage Prisoners Reveals about Contemporary Class Inequality* by Matthew Sparkes – challenges prevailing Marxist and asset-based theories (such as that developed by Adkins et al., 2020) on class inequalities in debt-leveraged homeownership economies like the US, UK, and Australia. It argues that existing accounts overlook the crucial role of algorithmic credit scoring systems in shaping access to debt and housing. Through qualitative interviews with 'mortgage prisoners' – borrowers unable to re-mortgage despite making timely payments – it explores how credit scores affect their ability to access housing. Drawing on the work of Fourcade and Healy (2013) on 'classification situations' the findings reveal that credit scores heavily influence homeownership experiences, leading to hyper-awareness and internalization of moralistic judgments.

The third paper – *Valuing Lived Experience and Co-Design Solutions to Counter Racial Inequality in Data and Algorithmic Systems in UK's Digital Services* by Aunam Quyoum and Mark Wong – provides a broader perspective on the digitization of public services in the UK, within which access to social housing and housing-related benefits are embedded. This paper examines the accelerated digitization of services in the UK amid the COVID-19 pandemic and highlights the lesser-known vulnerabilities faced by ethnic

minorities in many data-driven processes. It argues that racialized minorities' experiences must be understood and valued to enhance the inclusivity and equity of digital services. Through qualitative interviews and workshops across England and Scotland, it explores how ethnic minorities experience digital services, revealing issues of trust, data privacy, and unequal access. The study emphasizes the impact of racism on these experiences, both structurally and institutionally, and proposes some solutions to mitigate this.

The fourth paper – *Open Banking and Data Reassurance: The Case of Tenant Referencing in the UK* by Alexandra Ciocănel and her colleagues – explores the implications of the expansion of (hitherto little known) Open Banking (OB) systems beyond financial services into tenant referencing in the UK. While OB was initially intended for financial decision-making, its application in tenant referencing is relatively unexplored. Drawing on qualitative research within the UK PRS, including interviews with landlords, letting agents, tenants, and referencing companies, it reveals OB's adoption as a calculative practice for streamlining rental applications. The study considers perspectives from both consumers and professionals, highlighting how OB's implementation is influenced by factors such as interface design and power dynamics within the rental market. It suggests that OB in tenant referencing often functions as a default rather than an opt-in option, particularly when tenants feel they have limited control over the sharing of their data.

The fifth paper – *Mediating Access: Unpacking the Role of Algorithms in Digital Tenancy Application Technologies* by Linda Przhedetsky – continues this theme by examining the rise of Digital Tenancy Application Technologies (DTATs) more broadly. DTATs are now the primary method for renters in the PRS to apply for housing in Australia, the UK and the USA. These digital tools aim to streamline application processes by collecting various data beyond traditional rental history and income, including social media activity and behavioural data. Utilizing insights from the study of the banking and insurance sectors, the paper explores how DTAT algorithms can impact individuals' access to essential services within competitive markets, potentially leading to unfair treatment and significant harm. Again, influenced by the work of Fourcade and Healy (2013), it proposes an analytic framework to understand how these algorithms screen and sort applicants, categorizing the sorting process into 'scoring,' 'rating,' and 'ranking.'

The sixth paper – *The New 'Lettings Agent's Window': Interface Design and Discrimination on Online Rental Platforms* by Jed Meers – looks in more detail at the digital interfaces that provide access to the UK PRS. The paper investigates the profound shift towards online engagement in accessing the PRS, with a staggering 96 per cent of UK renters now utilizing major online platforms like *Rightmove*, *SpareRoom*, *Zoopla*, or *Gumtree*. It examines how the design of these platforms' interfaces can either enhance or diminish access and potentially perpetuate discrimination against users. By proposing a typology of interface design choices, including content structuring, sorting mechanisms, and user interactions, the paper explores how even minor design adjustments can significantly impact market accessibility. Through a comparative analysis of well over 3,000 listings on a leading rental platform, the paper reveals the potential for design changes to either mitigate or exacerbate discrimination against specific user groups, particularly recipients of housing benefits.

The seventh and final paper in the collection – *Automation Hesitancy: Confidence Deficits, Established Limits and Notional Horizons in the Application of Algorithms within the Private Rental Sector in The UK* by Dave Beer and his colleagues – provides a useful

corrective to some of the extant literature in this field which sometimes assumes that algorithms, machine learning, artificial intelligence and so on, are applied wherever possible, and without hesitation. The paper argues that things are not so smooth. It introduces the concept of 'automation hesitancy' through qualitative research examining algorithmic decision-making in the UK PRS. Reflecting on the rise of automation, it underscores the importance of detailed accounts of algorithm implementation within specific sectors and addresses confidence deficits therein. Exploring established limits and future horizons, it examines how these factors shape algorithm use in decision-making processes. Automation hesitancy encapsulates the reluctance among decision-makers providing access to privately rented housing to embrace algorithmic processing, shedding light on its causes, boundaries, and the influence of future perspectives. Through analysis of the UK PRS, the paper challenges assumptions of seamless algorithmic integration, revealing nuanced landscapes shaped by hesitations and reservations.

Some cross-cutting themes

The seven papers offer new insights into at least three aspects of algorithmic dwelling that are worth highlighting. First, and likely of most importance, *algorithmic risk profiling technologies of various sorts are influencing access to housing across all tenures*. This is particularly so in the context of (social) credit scoring systems, tenant referencing, and digital interfaces for rental platforms. Algorithms are now powerful intermediaries that influence our ability to secure housing finance and navigate rental markets. The digitization of housing and housing-related services, including tenant referencing, tenancy application processes, and access to social housing benefits is becoming ubiquitous and the implications of this for issues of equity, inclusivity, and user experiences, particularly for marginalized groups, is a key issue. Second, *human-technology interactions and resistance in this field need to be better understood*. Between them the papers offer a nuanced exploration of human-technology interactions within housing contexts, emphasizing both the transformative potential and the complexities of these relationships. Concepts like 'cybersymbiosis' and 'automation hesitancy' together with detailed understandings of user experiences with digital interfaces highlight the dynamic interplay between humans and technology, including moments of resistance and reluctance towards algorithmic decision-making. Third, and finally, the notion of algorithmic dwelling invokes a clear demand for *a more rounded consideration of the ethical implications of the technology and its entanglement with housing*. The emergence of new (social) credit scoring technologies, combined with OB systems, DTAT and other 'proptech' related software systems are impinging on many housing-related processes in ways that are often not well understood and, almost certainly, poorly regulated. Taken together these three cross-cutting themes illustrate the shifts in algorithmic dwelling along with the deepening of varied ways in which algorithms intermediate access to and the enactment of homes.

Note

1. In this regard, this special issue is something of a repeat performance. It is now seventeen years since Burrows and Beer made a similar intervention in the pages of this journal by

introducing the readership to what was then an area of some specialisation – urban informatics. That 2007 special issue of *Information, Communication & Society* (10:6) on *Urban Informatics: Software, Cities and the New Cartographies of Knowing Capitalism* may now be of only historical interest, but we hope that this collection has a similar impact in alerting those working outwith housing and urban studies to an important literature not otherwise sufficiently engaged with.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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