Article

BIG DATA & SOCIETY

Big Data & Society
April-June: 1–12

DOI: 10.1177/20539517241242537
journals.sagepub.com/home/bds
Sage

The EU Settlement Scheme: Footprints in quicksand

Cristina Juverdeanu

Abstract

Part of an accelerated trend to integrate algorithms in immigration decision-making, the UK's EU Settlement Scheme relies on automated data checks as an essential and mandatory step in the application for UK residence. In this article, I engage with the literature on datafication and algorithmic accuracy to showcase algorithmic inaccuracy within borders in regard to the allocation of residence statuses and rights. I argue that, while the EUSS uses big data to create a data double of the 'desirable' migrant, even applicants within this category experience mismatches. Some EU+ Citizens on linear residence and career trajectories were initially offered pre-settled status and had difficulty proving their entitlement to the full status, while others, who did not qualify for settled status, obtained it nevertheless. The analysis is based on in-depth interviews with high skilled applicants, and experts on the EUSS, exposing that footprints are not evidence per se. Instead, the outcomes are decided by an opaque algorithm that is not retained and disappears as easily as footprints in quicksand.

Keywords

Brexit, EU Settlement Scheme, algorithm, footprints

Introduction

Big data and algorithms are becoming increasingly more intertwined with our daily lives in unnoticeable and often unscrutinised ways. Their use in border crossings has started appearing on academic agendas, as reviewed below. Yet, the focus of these contributions has been on how algorithms have excluded the 'undesirable', 'abnormalized' migrant. This article contributes to the literature by showing how algorithmic immigration decision-making can also take place within borders, deciding residence statuses and rights, and can also create the portrait of the 'desirable' migrant.

The EU Settlement Scheme (EUSS) was set up to protect the rights of EU, Norwegian, Icelandic, Liechtenstein and Swiss nationals and their family members (hereafter EU+ Citizens) to reside in the UK if they have established residence in the country before December 2020. In order to do so, it verified the applicant's identity, residence, and criminality through an online system based on automated data checks, at least in the first phase. Applicants had to use the EU Exit: ID Document Check app to complete the identity stage of their EUSS application.

This scheme is part of a bigger trend of bringing big data and algorithms into immigration control in the UK and beyond. Scrutinising the functioning and implications of using such algorithms is paramount. I focus on the automated data checks – a mandatory and essential part of the application – and ask how accurate these are. I then go on to map the implications of the questionable accuracy of an opaque algorithm.

Through 22 content-rich interviews with applicants to the EUSS and four exploratory interviews with experts involved in the process, I show the contrasting stories of those who have been in the UK for less than five years and obtained settled status and those who have been in the UK for more than five years and had difficulty proving their residence. I maintain that the EUSS is a case of big data analytics reconstructing the profile of the applicant in an anticipatory way and in doing so, it misses a myriad of aspects. The EUSS features an opaque algorithm and a business logic that is not retained, a burden of responsibility more often than not shared between the

School of Politics and International Relations, Queen Mary University of London, London, UK

Corresponding author:
Cristina Juverdeanu, School of Politics and International Relations, Queen Mary University of London.
Email: c.juverdeanu@qmul.ac.uk

algorithm and the applicant, and, potentially, incorrect outcomes.

The article begins by discussing the new data politics and how it leads to categorisation. It then discusses the methodology before going into the application of the theoretical framework to the EUSS, a case study of significance. It uses the interviews to showcase how categorisations emerge in practice and distinguish between 'abnormalized' and 'desirable' migrants. Discussing how footprints are not evidence per se, it draws attention to the role of algorithms in creating the data double and goes on to map the implications of using opaque algorithms whose business logic is not retained.

The new data politics

The new data politics, as defined by Bigo, Isin and Ruppert (2019), looks at how data reconfigures relationships between states and subjects. Subjects can be citizens as well as non-citizens and this article focuses on the latter category, in relation to the allocation of residence statuses. Big data is often presented as 'a digital footprint, almost inevitably left behind by every digital step taken' in the context of the datafication of our lives (Madsen et al., 2016: 279). To Ajana, big data is more than footprints; it is the ensemble of techniques 'involving the aggregation, computation and analysis of complex and large-size contents which attempt to establish patterns and connections' (Ajana, 2015: 61). The data used by the EUSS fits into this definition of big data, because data collected by other institutions and for other purposes – by HM Revenue & Customs (HMRC) and the Department for Work and Pensions (DWP) for employment and social security reasons – is regrouped and reconstituted into a data double and used to determine the duration of residence for immigration purposes.

The relationship between immigration decision-making and bias human judgements has been long documented. Briddick and Costello (2021: 328) captured how 'nationalist, colonial, and postcolonial projects' of exclusion are reflected in migration laws and controls. At the very core of these discriminatory practices are categorisations (Costello and Foster, 2021: 344). Nonetheless, with the shift towards less-human-influenced immigration decision-making also comes the promise of speed, efficiency and neutrality. Relying on algorithms can be considered valuable, given that these decisions are sometimes presumed to 'offer more data-driven, "rational" and less idiosyncratic forms of policy-making' (Madsen et al., 2016: 282). Benjamin, however, draws attention to how human decisions shape both the data and the design of the algorithm, and how this is now concealed by the promise of neutrality even though the algorithm has 'the power to unjustly discriminate at a much larger scale than biased individuals' (Benjamin, 2019: 422). Biases and decisions 'haunt the room where the systems of automated rules-based targeting are built' (Amoore, 2011: 38) and judgements on how to refine the algorithm and where interventions are warranted are made by humans. This article subscribes to the literature's invitation to be judicious of the new data politics, taking a critical approach towards the 'cult of data-ism' (Berry, 2019: 45), based on the premise that the potential biases are all the more dangerous when hidden behind this promise of neutrality and scaled up and applied with a greater reach. The EUSS algorithm had such an extensive reach, having processed more than 6 million applications by the closing date of the scheme on 30 June 2021.

Significant works on the EUSS (Bueltmann, 2020, Barnard et al., 2021, Bueltmann and Bulat, 2021) have focused on the experience of the general public and highlighted patterns of vulnerability of women (Yong, 2022) or children (O'Brien, 2021). In this study, I propose a different approach, a qualitative exploration meant to cast doubt on the accuracy of the automated data checks within borders and through the privileged category of the 'desirable' and 'bona fide' (Bigo, 2014) immigrant.

Introduced after the end of the Brexit transition period, the UK points-based immigration system is meant to attract the 'best' and 'brightest' (Home Office, 2020) while filtering out the less high skilled. Highlighting the importance of market forces, Lori and Schilde (2021: 7) contended that migration and border control are intricately connected to both the 'security initiatives of states and the market forces'. The preference for the 'best' and 'brightest' is visible even before the introduction of the points-based system and, I argue, noticeable through the EUSS categorisation of the 'desirable' migrant discussed in this article.

'Desirable' migrants have received comparatively less attention to vulnerable migrants. Important contributions have looked at them in various contexts: the EU (Favell, 2008), New Zealand (Simon-Kumar, 2015) and the United Arab Emirates (Le Renard, 2021). Simon-Kumar (2015) made one of the first contributions on the changing discourses on the desirability of migrants and observed how 'in a rapidly globalising world, it is economic viability – either funds or qualifications' (Simon-Kumar, 2015: 1185) that has replaced race in becoming the relevant factor for desirability, a situation very much reflected in the UK context. The mobility of such 'desirable', usually high skilled EU+ Citizens used to be easy and quite unnoticed, as they were able to 'move across borders unregistered, and live […] unchecked, legally' (Favell, 2008: 237). Their story in the UK is a story about how '"liquid"– relatively free – EU mobilities [are] – "solidified"– due to Brexit' (Lulle et al., 2017: 3).

During the EUSS application process, based on erratic evidence, some migrants obtained a status they did not qualify for while others had difficulty obtaining a status they fully met the criteria for. The article exposes this algorithmic inaccuracy, as well as how the data double is at its best in the EUSS application. It contributes to the literature

on algorithms at the intersection between international political sociology and science and technology studies by showing a first-hand experience of immigrants who relied on this algorithm to acquire their right to reside in the UK. First, their case study showcases the datafication of immigration decision-making within borders, in allocating residence statuses and rights, and the issues of opacity and lack of accountability that derive from it. Second, the inconsistency of pre-emptive data doubles has been explored by the literature in relation to 'non-desirable' migrants. This article contributes to the literature with a case study of 'desirable' migrants, showing how they too are concerned by mismatches.

Categorising migrants

The pressure for live governance has led to the pressure for speed and the datafication of both law enforcement and border control (Leese and Pollozek, 2023). The 'datafication of borders' is understood as the increased deployment of 'mundane digital devices' in borderzones (Aradau, 2022: 27). With the widespread 'proliferation of migration control-related information systems' (Scheel et al., 2019: 581) comes the augmentation of borders, as big data brings with it 'big borders' through which 'the scope of control' can also be augmented and intensified (Ajana, 2015: 66). However, given the 'ubiquity of borders' and the fact that 'some borders are no longer situated at the borders at all' (Balibar, 2002: 84), these information systems have permeated every space of the social universe. The EUSS is an excellent example of algorithmic migration control taking place within borders, allocating residence statuses and rights to people who have been living in the country, in the biggest exercise of its kind. It, thus, allows for a much-needed analysis of algorithmic accuracy beyond borderzones.

The literature has discussed the many weaknesses of this type of data deployment and how it anticipates 'a population yet to come' (Amoore, 2011: 29) without 'even encountering them' (Ajana, 2015: 74), thus facilitating a 'new form of anticipatory governance' (Madsen et al., 2016: 284). Even if often presented 'as the irrefutable "electronic footprint" of the data subject, left behind in the residue of a digital world' (Amoore, 2011: 34–35), the data derivative is much more than that. Algorithms rely on data doubles (Ericson and Haggerty, 2000) that are dissociated from physical bodies (Lyon, 2010, Bigo, 2014) and work through '"traces" registered through data as bits of information' (Bigo, 2014: 218). The data derivative is created 'across the gaps and absences' (Amoore, 2011: 33), as footprints are, by definition, discontinuous. The traces left by the immigrant are not evidence per se, 'but a set of relations from which the derivative can be written' (Amoore, 2011: 37). These data derivative approaches to immigrants have been applied to study the securitisation of 'undesirable' migrants, yet another way to use 'data derivative as a specific form of abstraction', still in view of developing 'contemporary risk-based security calculations' (Amoore, 2011: 27), is to focus on a case study of 'desirable' migrants. Beyond the opacity of the EUSS algorithm, it is indeed the anticipatory nature of the footprints' reconstitution into the data double that emerges from my interviews, testifying to how algorithms mismatch by ignoring a myriad of facts.

The process of categorisation is at the heart of this type of pre-emptive data analytics (Amoore, 2011; Ajana, 2015). This 'accumulation of data traverses subjects' (Ruppert et al., 2017: 6) and assigns them to different categories based on an anticipatory interpretation of their data double in an 'ever-increasing abstraction of people' (Ajana, 2015: 74). Amoore (2011: 39) articulates how the data derivative captures the most 'prosaic, intimate, banal traces of our lives, yet forgets us'. This anticipatory governance, of course, allows for quick and easy processing, but also for potential inconsistencies and biases. Smart technologies are 'detecting, filtering and preventing undesirables (…), without interfering with those deemed desirable or bona fide' (Bigo, 2014: 218) and, in doing so, such technologies of control 'work to shape and define the meaning and practice of both mobility and irregularity' (Squire, 2011: 29). In the process, the 'good' immigrant is rendered invisible, whereas the suspicious one is subjected to multiple checks. In this vein, the EUSS algorithm also abnormalizes some trajectories and normalises others even among high skilled 'desirable' migrants, while allocating different statuses and rights accordingly. The aim is to make the data actionable in a situation of uncertainty, rather than to predict the future (Amoore, 2011).

The datafication of borders also raises the issue of data quality in border control (Leese and Marugg, 2023). Given the pressure to develop more datasets for evidence-based migration management (Beduschi, 2021), some datasets are also being repurposed. The very quality of the databases used by the EUSS has been put into question, as discussed in this article. Beyond the quality of the data, there have been calls for procedural transparency. However, seeing does not mean understanding. Valdivia et al. (2022: 2) defend that 'making datafication transparent is not sufficient' and plead for developing 'modes of intelligibility rather than just transparency'. Furthermore, transparency is not enough to hold the system accountable, given that 'an algorithmic system is not just a code but an assemblage of human and non-human actors' (Ananny and Crawford, 2018: 983). This article contributes to the understanding of the differences between footprints and outcomes, showing how algorithms do much more than read footprints.

Methodology

This qualitative exploration serves to question the accuracy of the automated data checks. The EUSS has been chosen as

a unique case study of algorithmic immigration decision-making within borders and at a large scale. While the number of interviews does not allow for drawing inferences on the experiences of more than 5.5 million EU+ Citizens who applied before the end of the scheme, it is enough to cast doubt on the accuracy of the algorithm by showing that even among a small number of 'desirable' applicants, one can immediately identify hits and misses. The empirical contribution also comes from this focus on 'desirable' migrants as explained above.

Following ethics approval, 26 semi-structured interviews were conducted between June 2019 and March 2020 in London (in person) and via Skype and telephone, each lasting between 30 and 40 minutes. Among them, 22 EUSS applicants were recruited using purposive sampling, starting from the portrait of the 'desirable' or 'bona fide' immigrant, described above. The choice is in line with the current UK points-based immigration system, which gives additional points to applicants holding a PhD. As such, I purposively targeted PhD holders in London, chosen as a talent hub. As the initial purposive targeting was followed by a snowballing technique, it led to the inclusion of PhD holders outside of London, as well as of four other highly qualified Europeans that did not hold a doctorate. My sample included men and women within different age groups, coming from 12 countries, and working in different fields, from social sciences to IT. I also built on four exploratory interviews with professionals involved in helping EU+ Citizens apply to the EUSS: a legal expert, two charity caseworkers, and a Chief People's Officer for an NHS Trust. All these four interviews were taken in London, in person, and helped clarify different aspects of the functioning of the scheme. All interviews were transcribed and analysed based on the theoretical discussion of categorisation, around the themes of footprints and EUSS outcomes.

The datafication of daily lives

EU+ Citizens in the UK left behind footprints that were collected by HMRC and the DWP for employment, pension and benefits purposes. As Brexit rendered the transfer of a large number of residence rights under UK law a necessity, the quick and efficient solution relied on these two databases, repurposing their data and making it actionable for immigration decision-making. The public launch of the EUSS took place on 30 March 2019, following three pilot phases, two private and one public. An estimated 5,548,440 people applied by 30 June 2021, the closing date of the application (Home Office, 2021). It is worth mentioning that only special cases were and still are allowed to apply after the closing date. In terms of outcomes, out of the 5,444,550 applications concluded by September 2021, 52% were granted settled status, 43% were granted pre-settled status and 4% had other outcomes (including refused, withdrawn, void or invalid applications) (Home Office, 2021).

To qualify for settled status, one had to prove five years of continuous residence (with less than six months abroad in any 12-month period or a justified absence of a maximum 12 months for training or studying, etc.), while for pre-settled status, one day of residence in the UK in the last six months sufficed. Settled status is a permanent leave to remain that: (a) allows the holders to apply for British citizenship after one year from obtaining it, (b) ensures that children of the holder are born British, (c) allows for unconditional benefits and (d) an absence of up to five years from the UK. Pre-settled status is a temporary leave to remain that: (a) does not allow for naturalisation, (b) does not ensure that children are born British, (c) offers a conditional access to some benefits and (d) allows for an absence from the UK of up to two years. The UK High Court ruled that people with pre-settled status cannot lose their status if they fail to apply for permanent status once their temporary one has reached its expiration date (The High Court of Justice, 2022). The implications of the Court's decision are yet to be seen, but, for now, the differences between pre-settled and settled status remain paramount.

The automated data checks were an essential part of the process, and most applicants went through them either by only providing the National Insurance number (NINo), enabling the Home Office to 'carry out automated checks of UK tax and some benefits records held by HMRC and the DWP to establish their qualifying residence' (Home Office, 2019: 5), or, on top of providing the NINo, by 'supplying additional evidence to add to the residence footprint identified by the automated checks' (Home Office, 2019: 5). There was also an exceptional way of applying by supplying documentary evidence alone, which was used, for instance, for children.

To start the automated checks, the applicant had to input their name, date of birth, and NINo, which were automatically sent to the DWP and HMRC. The information was then transferred to a Citizen Matching Layer, which identified the applicant and provided their details. It was only then that, as Tomlinson (2019: 27) observed, it was sent back to the 'Home Office and transferred to its "business logic" – an algorithm which is yet to be disclosed publicly – which processed the information to establish the period of continuous residence in the UK'. The Immigration Law Practitioners Association (ILPA) also noted that no public information has been provided on the content of this 'business logic' (ILPA, 2019: 2). The outcomes could then be a pass, a fail (if the check did not identify any matching information) or a partial pass (for less than five years of residence). If the automated checks met the residence requirements, then the applicant was granted settled status. If they did not but the applicant opted for settled status, then they were asked to provide documentary evidence to be reviewed by a caseworker.

There is data on the degree of automatic matching during the pilot phases, but no equivalent for the public one. For instance, the private beta testing phase 1 report indicated that 96% of the applicants checked with HMRC were 'automatically matched' to a record, with a further 3% requiring 'some form of intervention' to achieve a match, and 1.4% unable to match (Booth, 2019: 23). Fewer applicants were automatically matched during the public beta testing phase, 88% chose to provide their NINo, thus enabling the automated checks, and '73% of decided adult cases did not need to provide any further evidence of UK residence following the automated checks' (Home Office, 2019: 7). This testifies to the wide-reaching use of algorithmic decision-making in the EUSS and to how the promise of neutrality cannot be taken for granted, as the algorithm needs to be scrutinised.

The pressure for speed

The EUSS does indeed have the advantage of speed, having processed more than 5.5 million applications in just two and a half years. For the most part, my interviewees found the process to be quick and easy, especially those who applied during the pilot phases. One such applicant is a Dutch man working in Higher Education, who applied in 'November–December' 2018. He recalled that 'it was very easy' and everything 'was done within an hour, and I had a response within the same day' (Dutch man in HE). Another positive same-day response without any request for additional information was obtained by a Portuguese woman in Higher Education who remembered how she initially 'thought it was going to take ages' but got a confirmation the 'same evening' she applied, which made her 'think that it wasn't a human process' (Portuguese woman in HE). A Romanian woman working in Project Management mirrored the experience of the previous interviewees in terms of ease of application process, which she found 'very straightforward', especially when compared to the permanent residence application (Romanian woman in Project Management). The onerous permanent residence application was also mentioned by a Romanian man in Higher Education who recalled that his application was 'huge – it was two big ring binders' that included 50 letters from the bank and took a long time (Romanian man in HE). In comparison, the EUSS reliance on the app was seen as an important advantage by many interviewees. A Polish woman working in Higher Education (who got the decision the next day) also praised the app itself for being 'absolutely straight-forward', with 'each step [on] a separate screen, with a separate question, easy to understand' (Polish woman in HE).

The 'abnormalized' migrants

Speed comes with trade-offs in terms of data quality and outcomes. The lack of accuracy is exposed by the 'abnormalized', people who have been in the UK for more than five years, uninterruptedly, but had to work hard to provide extensive documentary evidence. A Turkish woman working in Higher Education received pre-settled status for a borderline case, despite her living in the UK for 12 years. Her story is not straightforward, as she was on a doctoral visa and a post-doctoral extension from 2007 to 2014 and, following marriage, she 'shifted to EEA family permit' until she applied to the EUSS in May 2019. Despite telling the caseworker she had been in the country for 12 years, she was told to only focus on the marriage, and, hence, the EEA family permit. She got pre-settled status for falling a few days short of the five-year requirement, being told that 'if it's less than five years, make it pre-settled' (Turkish woman in HE). She received the decision two days after she met the five-year under EU law requirement for settled status.

A Romanian man working in Education applied in January 2020 after six years in the country, during which his residence was continuous but his employment was not. He was aware that his 'lack of employment in the initial stage of the PhD' might be an issue, but he was, nonetheless, caught off guard by the fact that he was required to provide evidence 'for more years than the five that were needed' (six years, starting from 2014). He managed to cover the period with a single document, his PhD enrolment certificate, and got settled status eight days after the submission (Romanian man in Education).

An Italian woman working in Higher Education applied in September 2019 because she wanted to make sure she had the five required years. To her surprise, she got the pre-settled suggestion straight away, but 'didn't accept it because [she knew she] could have gotten the settled one' (Italian woman in HE 2). She was then asked to provide evidence for 'all years', and she included a certificate 'from the master's programme, (…) bank statements, and PhD certificate'. After submitting extensive information, 'after one month and a week, [she] got the settled status' (Italian woman in HE 2). Extensive information was also required from a Hungarian man working in Higher Education who, despite living for more than five years in the UK, recalled how 'the system said that I'm only eligible for pre-settled status, (…) [unless I provide] additional evidence for 2013, 2014, 2017, 2018, 2019 (…) [even though] I had employment in 2013 and 2014, so I was surprised that HM agency didn't have a record of that' (Hungarian man in HE). He chose to upload his academic transcripts and PhD enrolment letter, which he found easy, as he recalled: 'I am very privileged in that way. I can provide evidence in very short time for long stretches of time' (Hungarian man in HE).

Another Hungarian, a woman working in Higher Education who has been in the UK since 2004 was asked to provide extensive information. She had been registered as a worker from her arrival in 2004 and was

even part of the worker's registration scheme for Hungarian nationals. She worked for the entirety of her stay in the UK: 'so when I was full-time studying, I was doing full-time work as well' (Hungarian woman in HE). However, the application process was painful, as the app froze multiple times, making the process take an hour and a half, only to result in a request to provide additional information. She mentioned how she was 'flustered for what they asked for because they asked for information for "six years"' (Hungarian woman in HE). Her story is telling, as the automated checks failed to detect her continuous employment on the same NINo she has had since 2004. She then spent a long-time gathering information: confirmation of employment, confirmation of study, etc.: 'I was just basically trying to get seven pieces of documents to prove six years and six months of residency while at the same time thinking "but [it's] obvious, because I was here"' (Hungarian woman in HE). She finally obtained settled status after two months.

A Romanian woman working in Higher Education first tried the permanent residence route, but had her application refused. Even though she applied for settled status during the pilot phase, she still had a hard time, despite being in the UK since 2012. She was shocked to be suggested pre-settled status and be 'asked to provide additional evidence for every single year'. She recalled how she provided information on every month, and what she found 'most surprising' was that 'the automatic checks did not work', as, after checking on 'HMRC online', she saw that she did 'have a record, [of] all the companies [she] worked for and how much [she] earned'. Even though the employment 'wasn't full time' and she 'had gaps', she did pay 'national insurance', which she thought would be enough for 'the trial' period (Romanian woman in HE). She pondered on the algorithm's inability to deal with 'temporary work or stay-[at]-home mothers who worked part-time', as she felt 'suspicious about the system because it felt like even if you (…) have work every month [but] pay national insurance contributions (…) below the threshold of income tax', 'the automatic checks may not see it' and you need to provide extensive information, which was the case for herself and many of her friends (Romanian woman in HE).

The discontinuous footprints

Even when footprints are not found, the pre-emptive image of the 'desirable' migrant can still emerge, and this is the most visible in borderline situations. Two cases of discontinuous footprints are worth mentioning here: one of a German and another of a Finn, both working in Higher Education and both having to submit additional evidence to support their borderline situations. The German woman working in Higher Education also applied during the pilot phase and received settled status on the same day. She was not sure she will 'get settled status because [she] had been a student for all [the] time' spent in the UK and 'didn't know whether that was going to work out well and whether [she] might have any sort of problem', and also because, at the time of the application, she lived part of the year ('about six months') away from the UK. While she did have to submit her Master's and PhD certificates, she deemed the process very easy (German woman in HE). A Finnish woman in Higher Education spent more than a year abroad, but, nevertheless, got settled status, having had to submit extra documentary evidence, which caught her 'off guard'. The app's request concerned several years, and she decided to submit 'the registration papers, bank statements, a letter from the university in Japan, (…) [and] a letter from [her] work department' (Finnish woman in HE). In the end, she was granted settled status.

In contrast, other applicants in similar borderline situations did not have to provide additional information. For instance, a French woman working in Higher Education thought that her year spent abroad during her studies 'was going to be a challenge for the application of settlement'. It was not, as she obtained settled status. She explained the existence of her footprints through the fact that she 'was working in a restaurant before going as an Erasmus' and assumed her employer did not delete her from their books: 'I'm aware that the HMRC keep track of all this information. In the case that they do, well, sometimes they're not as good at updating their systems' (French woman in HE). Nonetheless, the case is notable because even though only a student and a part-time employee and abroad for a year, she was not asked to provide any documentary evidence – the algorithm somehow deemed her footprints visible enough.

A similar case is that of an Italian man working in Higher Education, who also applied during the pilot phase. He started our conversation by mentioning that he obtained settled status even if he had been in the UK 'on and off' for the past seven years. He completed his PhD in the UK, went abroad for a post-doc and then came back for an academic position. Whilst living abroad for more than the accepted period, he maintained a link to the UK by registering as self-employed, keeping his flat, paying council tax, and visiting often. 'I wasn't 100% sure I would fulfil the criteria, so I had [my bank statements] already in a folder', but they were not required, as he ended up only communicating the NINo (Italian man in HE).

Another German working in Higher Education applied for pre-settled status because he interrupted his residence in the UK by one year. Nonetheless, his case is in many ways similar to the previous examples, including applying during the pilot phase, but the difference here is that he actually aimed for pre-settled status: 'I wasn't here for the

whole time, so I didn't aim for it (…) I am not sure I had a choice, I don't think I could select anything to be honest' (German man in HE).

The 'desirable' migrants missing the required time

Some immigrants obtained settled status even though they did not meet the requirements. Quite a few cases are telling in this regard, with an Italian man working in IT who applied during the public beta testing phase being one of the most striking ones. Despite his prejudice about the Home Office, he was pleasantly surprised by how they handled the application process: 'I was able to scan the chip in my passport, insert some information about myself, my NINo and the application was processed right away. It took three-four days until I got an email saying that the case has been picked by a caseworker, and, two hours after, I was granted, to my surprise, settled status' (Italian man in IT). His surprise stemmed from him not having 'been in the UK for five years when [he] applied', which was 'four years and six months' after he arrived to the UK, so he 'was expecting pre-settled and was granted settled'. He 'phoned them afterwards, an operator picked up the phone right away, and [he] explained the situation to him, he took a think for two minutes, he asked his supervisor (I suspect) [and] said "that's expected, that's okay, that's the way the system works, we have your footprint in the current year so we just granted you a settled status"' (Italian man in IT). He was curious to know more about why he was getting settled status when expecting pre-settled status and asked the caseworker about it, but their answer was: 'I am not at liberty to say that', but 'the system saw your footprint and it just went to give the application right away and that's fine' (Italian in IT). This highlights how opaque the algorithm is, as well as how arbitrary its interpretation can be, especially when considered in comparison to the case of the aforementioned Turkish academic.

Another person who applied for pre-settled but got settled is a high skilled Romanian woman working as an economist for the UK Government, who was aware she 'wasn't [in the UK] precisely five years' – 'it was four years and we're talking about maybe a week or two weeks difference'. So, at that point, she thought it safer to opt for pre-settled (Romanian woman in the Public Sector). She arrived in late September 2014 and applied in July 2019, but the application was lost and only completed via phone two months later. The operator told her to 'submit the application now' and not to 'worry'. She submitted the application and was notified that it was 'appropriate for the settled status', which 'was a nice surprise', as if she 'had the choice between the two, [she] would've actually applied for the pre-settled instead of the settled status'. She recalled she mentioned this to the caseworker, who encouraged her by saying 'this is what you should apply for so go for it' (Romanian woman in the Public Sector).

An Italian woman working in Higher Education selected pre-settled on the app because her residence was interrupted for more than 12 months: 'I had the information ticked for pre-settled status, then they processed the information automatically through an app and (…) said "you will be eligible for a settled status"'. She then selected once more 'the pre-settled one because [she] wanted to be honest, but (…) after three days' she received 'the letter saying "you're getting the settled status"' (Italian woman in HE 1). She had left the UK in July 2014 (having lived there for three years) and did not return until September 2015. She then applied for pre-settled status in November 2019, after four years and two months of continuous residence, and after only three years and 10 months of having a NINo. In comparison to other interviewees (Italian man in HE, for instance), she did not keep any connection with the country (as her tenancy agreement had expired), paid no taxes in the UK, and had no footprints whatsoever in the country. Knowing all of this and even after selecting pre-settled twice during the application, she obtained settled status without having to provide any documentary evidence (Italian woman in HE 1). The whole application took only 10 min and the answer arrived in three days. This is an interesting case because, in contrast to the other similar cases, she applied long after the pilot phase had concluded. She acknowledged that she 'couldn't rationally explain' why she obtained settled instead of pre-settled especially without being asked about her interrupted residence or student status. Finally, she confessed being a bit worried about getting settled instead of pre-settled, thinking that 'it might be later retracted', because when 'someone attributes you this random responsibility, (…) there's always this expectation that something may go wrong' (Italian woman in HE 1). The burden of responsibility is further explored in the 'implications' section.

The story of a Spanish woman working in Higher Education is more complicated in several ways. She is a dual national (Paraguayan) who did not work for part of her stay in the UK and who had less than five continuous years in the country at the time when she applied. She lived in the UK for less than a year from March 2010 to January 2011 (this is when she got her NINo) and then left for four years, returning to start working in March 2015. She applied for what she thought was pre-settled status in September 2019 but obtained settled status instead. The interviewee recalled that the application took five minutes, and she was not asked to provide any evidence, which came as a surprise to her. She had interrupted her employment for childcare, staying at home from December 2015 until late 2017, period during which she did not receive maternity allowance nor did she work as self-employed. However, the algorithm suggested 'settled status' straight away. She recalled she thought pre-settled

was a lesser status, but she 'cannot get settled, because [she] was not here long enough'. When asked 'are you applying for settled?', she said 'no, I'm applying for pre-settled'. After getting settled instead, she accepted it and decided not to do anything about it: they 'gave me that, I'm going to stick to that' (Spanish woman in HE). It is worth mentioning that for the last examples that obtained settled when applying for pre-settled, the residence was interrupted for long periods, and this seems to not have been detected by the automated checks.

The main reasons provided by EU+ Citizens who applied to the EUSS during the pilot phases were: the help they got from the employers and the sense of appreciation that came with that (Polish woman in HE), the feeling of urgency when faced with the expected March 2019 Brexit date (German man in HE), but also the ideas of beating the crowds (German woman in HE), and the impression that it will be easier to get a status during the pilot phase open to those working in the Higher Education sector (Italian man in HE). These are the 'bona fide' immigrants, the invisible ones. Quite paradoxically, they seem to be rather visible to the algorithm, as only two of them were asked to provide documentary evidence (German woman in HE and Romanian woman in HE). One particularity is that the decisions arrived almost immediately for those who applied ahead of the public launch of the EUSS.

Nevertheless, some of the applicants felt frustrated by the fact that they had to apply, because it 'forces you to prove yourself (…) despite being highly educated or coming here to work for a company that would be able to sponsor your visa' (Romanian woman in Consultancy). Some were not aware of the differences that pre-settled status implied in comparison to settled status (Bulgarian man in HE, German man in HE), an aspect also highlighted by Caseworker 2: 'not every client will understand the outcome of the application and the decision' (Caseworker 2). This was even more important for the German man in HE, who was one of the borderline cases, very comparable to other cases that got settled status. Sometimes, the differences seemed to be downplayed even by Home Office staff. This was the case for Turkish woman in HE, who obtained pre-settled after many years in the UK, and was told the only difference concerned British citizenship, both for her and for her children. However, as mentioned at the beginning, the differences are numerous and significant.

Implications of algorithmic immigration decision-making

Some EU+ Citizens who expected getting pre-settled status obtained settled status instead. Others who lived for more than five years in the UK and had straightforward residence and employment trajectories were asked to provide additional information to dismiss the suggested pre-settled status and acquire settled instead. These information-rich cases show that the footprints are not evidence per se, and the algorithm, which is a series of relations from which the data derivative can be written (Amoore 2011) mediates the outcome. The algorithm, whose business logic remains unknown still, is anticipatorily creating the profile of the 'abnormalized' immigrant, while rendering the 'desirable' immigrant invisible. Through this anticipatory approach, 'big data tools enable the systematic profiling of people and the forming of assumptions about their character, behaviour, activities and risk potential' (Ajana 2015: 74), thus creating their data double.

The EUSS was designed to process an unprecedented number of applications in record time and do so in a cost-effective way by saving human resources and, hence, taxpayer's money. Under this pressure for speed discussed above, it is then reasonable to assume that the core objectives of this kind of process were for the data to be actionable and the decisions to be quick and efficient. Nevertheless, while the automated checks validated the cost-effectiveness and speed goals, they seem to have fallen short of the accuracy goal. The scheme is a departure from how the Home Office historically dealt with initial immigration decision-making, which involved a paper application analysed by a caseworker. The traceability associated with one's NINo depersonalises the process, as neither the applicant nor the caseworker, more often than not, need to intervene at all in reaching an outcome. A human assessment is still part of the application, but it is effectively an 'ancillary process, with automated checks being given priority, and based on the trials conducted so far, the sole basis on which a decision is made in the majority of cases' (Tomlinson 2019: 26–27). The fact that these automated checks are mandatory, essential, and often the sole basis for decision makes the questioning of their accuracy even more important.

As mentioned, the EUSS fits an emerging trend wherein technology, especially automation, plays an increasing role in the Home Office and the administration of migration (Tomlinson 2019), a symptom of the fast-spreading data cult-ism. It is part of the UK's bigger trend of integrating big data and borders, seen also with the UK's 'visa streaming' traffic-light algorithm that graded every entry visa application to the UK. It is worth mentioning that was scrapped in August 2020 following legal action for discrimination (BBC 2020). Continuing the automation trend, the EUSS is a unique case study of algorithmic inaccuracy within borders, at the allocation of residence statuses and rights.

The footprints

One of the main problems of the EUSS is the fact that 'invisible' EU Citizens (Engbersen and Snel 2013) have not kept a footprint of their presence in the UK, because, in contrast to third-country nationals, they did not have

to. Indeed, one Chief People's Officer for an NHS Trust also pondered on how the number of EU+ Citizens who needed to apply to the EUSS was unknown even to the employer: 'targeting people when you don't know who they are is quite a challenge' (Chief People's Officer for an NHS Trust).

Given this, it can be argued that big data and the algorithm are there to help people. On the one hand, a legal professional explained that, particularly because EU nationals would not have kept 'their physical documents', it is a 'positive' thing to rely on 'HMRC and DWP data to help somebody gain settled status' (Legal professional). On the other hand, the application raises immense problems for the vulnerable. First, because of the format, numerous groups such as elderly, disabled, computer illiterate persons are less likely to be able to apply (The Migration Observatory 2020, Jabłonowski 2020) and, second, because the more vulnerable such as children, students, unemployed persons, victims of abuse are also less likely to have footprints (O'Brien 2021).

This links to the problem of a potential unreliability of the databases, especially under the pressure to develop many (Beduschi 2021), and, as seen here, repurpose some. For instance, the quality of the DWP database has been subject to criticism (Legal professional), an issue also mentioned by the ILPA report (2019). An extensive analysis of the automated checks highlighted that the 'DWP data quality is notoriously poor – the number of National Insurance numbers in use is tens of millions more than people of working age' (Booth 2019: 23). Moreover, as ILPA (2019: 9) observed, 'working tax credit, child tax credit and child benefit records are held by HMRC, not DWP' but do not show up on the list of records to be communicated by HMRC for the automated checks. Other types of mismatches could be the source of erroneous results, such as the way in which the applicant's name is spelled (Cyrillic or Latin, for instance). In addition, computers and algorithms can malfunction and data matching errors and false negatives can occur and have an impact not only on the persons in question but also on all similar profiles to come, in an anticipatory way.

The opacity

The lack of transparency started from the very fact that the applicant and the caseworker did not see the same information. At the end of the automated checks, the caseworker could see a monthly breakdown, whereas the applicant could only see a yearly one. This was detrimental to the applicant because they did not know for which specific months evidence was missing, which resulted in a heavier burden of finding and providing documentary evidence. As seen from the interviews, for many high skilled EU + Citizens it was rather easy to prove their PhD enrolment with a letter. However, for the vulnerable applicants, more and different types of documents are needed to substitute such an encompassing piece of evidence.

Moreover, seeing does not mean understanding, and the 'distinction between secrecy and opacity can also be formulated as that between invisibility and illegibility' (Valdivia et al., 2022: 3). As Legal professional highlighted, the raw data must first be correctly identified and, second, the algorithm must correctly be fed the data. Both these operations are non-transparent, as is any potential mistake in the making of the footprints. Furthermore, with the EUSS, the main problem is that the 'Home Office does not retain either the raw data or how the business logic applied to the raw data', thus 'how the system reached its decision' remains entirely 'opaque' (ILPA, 2019: 3). For the time being, the algorithm remains undisclosed, with the minor progress of an Appeal Court ruling giving EU+ Citizens the right to access personal data held by the Home Office when denied settled status or future immigration visas (O'Carroll, 2021). However, 'if an applicant asks for a statement of reasons as to why they failed the checks, the Home Office would not be able to provide an answer' (ILPA, 2019: 3). Even if the footprints existed and the steps have been reconstituted or rather imagined at some point, the logic that was used to create the data double disappeared in quicksand. Data does not automatically translate into data double categorisations, but instead it is mediated by the algorithmic system, which is a system of both human and non-human actors (Ananny and Crawford, 2018).

The scrutiny of this algorithm for potential biases and discrimination is hindered by the same opacity. It is true that 'not all distributive inequalities in opportunities for migration are open to challenge as unlawful discrimination' (Briddick and Costello, 2021: 328), but for one to be able to raise the question of unlawful discrimination they need to have access to the business logic of the algorithm. However, as discussed throughout this article, knowing the data does not equate to understanding the algorithm. Furthermore, as shown by the Appeal Court ruling, the depersonalised processing and the heavy reliance on an opaque algorithm raise the question of accountability and of who makes the decisions on how to refine the algorithm and when to intervene (Amoore, 2011).

The delegation

In order to establish accountability, it is important to consider how essential the automated checks are to the decisional process and whether the caseworker exercises a meaningful oversight of this first stage of the application. ILPA (2019: 5) defended that the automated checks are integral to the decision-making process and more than an 'added extra' because of their mandatory character. Moreover, they seem to be given priority and even represent the 'sole basis' for decision-making in the majority of cases,

as supported by Tomlinson (2019) and the reports on the pilot phases (Home Office, 2019; Booth, 2019). If, when challenged, the Home Office cannot show physical documentation on the automated checks because they simply do not have it, then the result can be legally challengeable 'on the basis that the Home Office would have improperly delegated their decision-making capacity, this time not to a private entity but to an algorithm' (Legal professional). In addition, if the caseworker is 'relying on the automated checks without any scrutiny, [this] is analogous to a decision taken on advice without exercising meaningful oversight of that advice' (ILPA, 2019: 6). If this would render a non-algorithmic decision unlawful, 'there is no good reason why delegation of powers to a machine should be treated any differently in law than when powers are delegated to a human' (ILPA, 2019: 6). But, as discussed at the beginning of this article, this seems to be the case, as algorithms come with the promise of rationality and neutrality.

Moreover, the addition of a new page on the app (introduced in December 2019) enhanced individual responsibility. Referring to before December 2019, a caseworker remembers 'the big question' they used to get from applicants: 'which one am I applying for?' and how the applicant did not 'get to choose which one [they were] applying for, the system told them which one they were eligible for' (Caseworker 1). If the result was a 'partial pass' then the applicant would see a screen with a sentence written in big and bold letters saying 'You'll be considered for pre-settled status', followed by a smaller question: 'What do you want to do?', 'Submit application for pre-settled status' or 'Show I am eligible for settled status'. From December 2019, the app then displayed the aforementioned screen but also asked a new question: 'How long have you lived in the UK?' 'Five years or more' or 'Less than five years'. As the cases described showed, even if the applicants have unticked the settled status box numerous times, or called and told the caseworkers they did not qualify for it, the fuller status was offered to people who have been in the country for less than five years. Nonetheless, this declaration is crucial in enhancing the personal responsibility of the applicant who must unambiguously declare for how long they have been in the country. This further shares the burden of responsibility between the algorithm and the applicant. This neutrality façade (Benjamin, 2019) takes the accountability away from governments and divides it between algorithms and applicants.

Conclusions

The EUSS is a unique case study of algorithmic inaccuracy in immigration decision-making within borders, being a tool for allocating residence statuses and rights. It is a case of big data, where data collected by other institutions is repurposed and made actionable to determine the duration of residence of applicants. 'Desirable' high skilled EU + Citizens were selected to explore how algorithmic categorisations create data doubles that anticipate the profile without knowing the person. Even among these 'bona fide' migrants, mismatches and inaccuracies were present. Some 'abnormalized' migrants who had been in the UK for more than the required period were suggested pre-settled status and had to provide extensive evidence to obtain the full status they were entitled to. There were also borderline cases of people missing footprints, among which some had to provide extensive evidence while others none at all. Finally, there were the 'desirable' migrants missing the required residence period who, nonetheless, obtained settled status.

The empirical analysis sheds light on how footprints are not evidence per se, even if often presented as such. In order to make footprints actionable, an algorithm, understood as an interpretation mechanism, is required. While the algorithm is presented as neutral and rational, it hides human decisions concerning what to include, consider and when to intervene. Nonetheless, neither the raw data nor the business logic of the EUSS automated checks are retained, and the footprints disappear in quicksand. The opacity of the process prevents seeing the algorithm's internal logic and takes us even further away from understanding it and how the decisions are made. The inability to scrutinise the algorithm for discrimination is thus paired with the undercutting of safeguards, hindering the power to challenge the decision and hold the Home Office accountable. This is also ensured by dividing the burden of responsibility between the algorithm and the applicant. Algorithmic decision-making is not necessarily accurate and while the steps taken in reaching this 'neutral' decision cannot be known, let alone questioned and appealed by the applicant, algorithms provide a limited form of justice.

Acknowledgements

I would like to thank many people for their generosity. I am most grateful to the interviewees for their time and vital participation. I am particularly grateful to Andrei Sora, Margherita de Candia, Marianna Griffini, Neil Winn, Simon Lightfoot for their invaluable support and feedback on earlier drafts of this article, and to Stefanos Marangos and Sorana Gheorghiade for their excellent research assistance. Finally, I would like to thank the editorial team and anonymous reviewers at Big Data & Society for their most helpful comments.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

I want to acknowledge the support of the Department of Political Economy at King's College London, which funded research assistance, and of the School of Politics and International

Relations at Queen Mary University of London, which funded the open access publication of this article.

ORCID iD


Cristina Juverdeanu https://orcid.org/0000-0002-7464-7128

References

Ajana B (2015) Augmented borders: Big data and the ethics of immigration control. *Journal of Information, Communication and Ethics in Society* 13(1): 58–78.

Amoore L (2011) Data derivatives: On the emergence of a security risk calculus for our times. *Theory Culture and Society* 28(6): 24–43.

Ananny M and Crawford K (2018) Seeing without knowing: Limitations of the transparency ideal and its application to algorithmic accountability. *New media & Society* 20(3): 973–989.

Aradau C (2022) Experimentality, surplus data and the politics of debilitation in borderzones. *Geopolitics* 27(1): 26–46.

Balibar E (2002) *Politics and the Other Scene*. London: Verso.

Barnard C, Fraser Butlin S and Costello F (2021) The changing status of European Union nationals in the United Kingdom following Brexit: The lived experience of the European Union Settlement Scheme. *Social & Legal Studies* 31(3): 365–388.

BBC (2020) Home Office drops 'racist' algorithm from visa decisions. Available at https://www.bbc.co.uk/news/technology-53650758 (accessed 27 February 2024).

Beduschi A (2021) International migration management in the age of artificial intelligence. *Migration Studies* 9(3): 576–596.

Benjamin R (2019) Assessing risk, automating racism. *Science* 366(6464): 421–422.

Berry DM (2019) Against infrasomatization: Towards a critical theory of algorithms. In: Bigo D, Isin E and Ruppert E (eds) *Data Politics: Worlds, Subjects, Rights*. London: Routledge, 43–63.

Bigo D (2014) The (in) securitization practices of the three universes of EU border control: Military/navy–border guards/police–database analysts. *Security Dialogue* 45(3): 209–225.

Bigo D, Isin E and Ruppert E (2019) Data politics. In: Bigo D, Isin E and Ruppert E (eds) *Data Politics: Worlds, Subjects, Rights*. London: Routledge, 1–18.

Booth P (2019) Automated data checks in the EU Settlement Scheme Report. Available at: https://www.infiniteideasmachine.com/2019/01/Automated_data_checks_in_the_EU_Settlement_Scheme.pdf (accessed 27 February 2024).

Briddick C and Costello C (2021) Introduction to the symposium on undoing discriminatory borders. *American Journal of International Law* 115: 328–332.

Bueltmann T (2020) Experiences and Impact of the EU Settlement Scheme: Report on the 3 Million Settled Status Survey. Available at: https://the3million.org.uk/sites/default/files/documents/t3m-NorthumbriaUniversity-report-ExperiencesImpactEUSS-20Jan2020.pdf (accessed 27 February 2024).

Bueltmann T and Bulat A (2021) EU citizens' identity, belonging & representation post-Brexit. Available at: https://strathprints.strath.ac.uk/82036/1/Bueltmann_Bulat_2021_EU_citizens_identity_belonging_and_representation_post_brexit.pdf (accessed 27 February 2024).

Costello C and Foster M (2021) Race discrimination effaced at the International Court of Justice. *American Journal of International Law* 115: 339–344.

Engbersen G and Snel E (2013) Liquid migration: Dynamic and fluid patterns of post-accession migration. In: Glorius B, Grabowska-Lusinska I and Kuvik A (eds) *Mobility in Transition: Migration Patterns After EU Enlargement*. Amsterdam: Amsterdam University Press, 21–40.

Ericson RV and Haggerty KD (2000) The surveillant assemblage. *British Journal of Sociology* 51(4): 605–622.

Favell A (2008) *Eurostars and Eurocities: Free Movement and Mobility in an Integrating Europe*. Malden, MA: Blackwell.

High Court of Justice (2022) Independent monitoring authority v Secretary of State for the Home Department [2022] EWHC 3274. Available at: https://caselaw.nationalarchives.gov.uk/ewhc/admin/2022/3274 (accessed 27 February 2024).

Home Office (2019) EU Settlement Scheme public beta testing phase report. Available at https://www.gov.uk/government/publications/eu-settlement-scheme-public-beta-testing-phase-report (accessed 27 February 2024).

Home Office (2020) Home Secretary announces new UK points-based immigration system. Available at https://www.gov.uk/government/news/home-secretary-announces-new-uk-points-based-immigration-system (accessed 27 February 2024).

Home Office (2021) EU Settlement Scheme quarterly statistics, June 2021. Available at: https://www.gov.uk/government/statistics/eu-settlement-scheme-quarterly-statistics-june-2021 (accessed 27 February 2024).

ILPA (2019) EU Settled Status Automated Data Checks – ILPA Research Piece. Available at: https://ilpa.org.uk/wp-content/uploads/resources/35100/EU-Settled-Status-Automated-Data-Checks-ILPA-Research-Piece.pdf (accessed 27 February 2024).

Jabłonowski K (2020) There are cracks in the EU Settlement Scheme – who will fall through them? Available at: https://blogs.lse.ac.uk/brexit/2020/05/06/there-are-cracks-in-the-eu-settlement-scheme-who-will-fall-through-them/ (accessed 27 February 2024).

Le Renard A (2021) *Western privilege: Work, intimacy, and post-colonial hierarchies in Dubai*. Stanford, California: Stanford University Press.

Leese M and Marugg F (2023) Data quality in European law enforcement and border control cooperation: Findings from survey research. *CURATE Project*, ETH Zurich.

Leese M and Pollozek S (2023) Not so fast! data temporalities in law enforcement and border control. *Big Data & Society* 10(1): 1–13.

Lori N and Schilde K (2021) A political economy of global security approach to migration and border control. *Journal of Global Security Studies* 6(1): ogaa011: 1–9.

Lulle A, Moroşanu L and King R (2017) And then came Brexit: Experiences and future plans of young EU migrants in the London region. *Population, Space and Place* 24(1): e2122: 1–11.

Lyon D (2010) Surveillance, power and everyday life. In: Kalantzis-Cope P and Gherab-Martín K (eds) *Emerging digital spaces in contemporary society*. London: Palgrave Macmillan, 107–120.

Madsen AK, Flyverbom M, Hilbert M, et al. (2016) Big data: Issues for an international political sociology of data practices. *International Political Sociology* 10(3): 275–296.

O'Brien C (2021) Between the devil and the deep blue sea: Vulnerable EU citizens cast adrift in the UK post-Brexit. *Common Market Law Review* 58(2): 431–470.

O'Carroll L (2021) EU citizens win right to access personal data held by Home Office. *The Guardian*. Available at: https://www.theguardian.com/uk-news/2021/may/26/eu-citizens-win-right-access-personal-data-held-home-office?fbclid=IwAR0WsgKoJJVna4WMOtlGOOwXWHiYGIUAlVm-BHtP4GsA5ldEzFNNOZQqFk0 (accessed 27 February 2024).

Ruppert E, Isin E and Bigo D (2017) Data politics. *Big Data & Society* 4(2): 1–7.

Scheel S, Ruppert E and Ustek-Spilda F (2019) Enacting migration through data practices. *Environment and Planning D: Society and Space* 37(4): 579–588.

Simon-Kumar R (2015) Neoliberalism and the new race politics of migration policy: Changing profiles of the desirable migrant in New Zealand. *Journal of Ethnic and Migration Studies* 41(7): 1172–1191.

Squire V (2011) Mobilizing politics. In: Squire V (ed) *The contested politics of mobility: Borderzones and irregularity*. Abingdon: Routledge, 119–120.

The Migration Observatory (2020) *Unsettled status? Which EU citizens are at risk of failing to secure their rights after Brexit?* Available at: https://migrationobservatory.ox.ac.uk/wp-content/uploads/2020/09/Report-Unsettled-Status-2020.pdf (accessed 27 February 2024).

Tomlinson J (2019) *Quick and uneasy justice: An administrative justice analysis of the EU Settlement Scheme. Public Law Project*. Available at: http://eprints.whiterose.ac.uk/150715/ (accessed 27 February 2024).

Valdivia A, Aradau C, Blanke T, et al. (2022) Neither opaque nor transparent: A transdisciplinary methodology to investigate datafication at the EU borders. *Big Data & Society* 9(2): 1–17.

Yong A (2022) A gendered EU Settlement Scheme: Intersectional oppression of immigrant women in a post-Brexit Britain. *Social & Legal Studies* 32(5): 756–775.

Interviews

Bulgarian man in HE September 2019.
Caseworker 1 June 2019.
Caseworker 2 June 2019.
Chief People's Officer for an NHS Trust July 2019.
Dutch man in HE September 2019.
Finnish woman in HE January 2020.
French woman in HE December 2019.
German man in HE June 2019.
German woman in HE June 2019.
Hungarian man in HE November 2019.
Hungarian woman in HE October 2019.
Italian man in HE June 2019.
Italian man in IT June 2019.
Italian woman in HE 1 October 2019.
Italian woman in HE 2 November 2019.
Legal professional July 2019.
Polish woman in HE June 2019.
Portuguese woman in HE December 2019.
Romanian man in Education March 2020.
Romanian man in HE June 2019.
Romanian woman in Consultancy June 2019.
Romanian woman in HE June 2019.
Romanian woman in Project Management June 2019.
Romanian woman in the Public Sector October 2019.
Spanish woman in HE October 2019.
Turkish woman in HE November 2019.