

Contemporary dynamics of human mobility: a systematized review

Dinámicas contemporáneas de la movilidad humana: Una Revisión Sistemática

Dinâmicas contemporâneas da mobilidade humana: uma revisão sistematizada

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Abstract

Introduction: In the interwoven fabric of contemporary human mobility and the use of information and communication technologies, this article addresses fundamental concerns such as privacy and government control of biometric data in the migration sphere; **Objective:** To analyze the ethical, legal and social implications of digital tools in migration, emphasizing challenges and opportunities, especially in relation to privacy and AI-driven decision-making; **Methodology:** Adopting a qualitative approach with a documentary and descriptive methodology, a systematic literature review was carried out, following some of the PRISMA guidelines, to explore the intersection between technology and migration from various perspectives; **Results:** Ethical challenges are revealed in migrant health, risks in AI decision-making, legal challenges of biometric surveillance and privacy concerns in digital migration; **Conclusions:** The need to ethically frame the use of digital tools is highlighted, ensuring the privacy and rights of migrants, and fostering genuine collaboration to support them in their migration experience.

Keywords: Civil rights; Ethics; Free movement; Migration; Privacy; Technologies.

Resumen

Introducción: En el marco de la movilidad humana contemporánea y el uso de las tecnologías de la información y la comunicación, este artículo aborda preocupaciones fundamentales como la privacidad y el control gubernamental de los datos biométricos en el ámbito de la migración; **Objetivo:** analizar las implicaciones éticas, legales y sociales de las herramientas digitales en la migración, destacando los desafíos y oportunidades, especialmente en relación con la privacidad y la toma de decisiones impulsada por la IA; **Metodología:** adoptando un enfoque cualitativo con metodología documental y descriptiva, se realizó una revisión sistemática de la literatura, siguiendo algunos de los lineamientos PRISMA, para explorar la intersección entre tecnología y migración desde diversas perspectivas; **Resultados:** se revelan los desafíos éticos en la salud de los migrantes, los riesgos en la toma de decisiones de IA, las cuestiones legales sobre la vigilancia biométrica y las preocupaciones sobre la privacidad en la migración digital; **Conclusiones:** Destaca la necesidad de enmarcar éticamente el uso de herramientas digitales, garantizando la privacidad y los derechos de las personas migrantes, y fomentando una colaboración genuina para apoyarlas en su experiencia migratoria.

Palabras clave: Derechos civiles; Ética; Libre circulación; Migración; Privacidad; Tecnologías.

Resumo

Introdução: Tendo como pano de fundo a mobilidade humana contemporânea e o uso de tecnologias de informação e comunicação, este artigo aborda preocupações fundamentais, como a privacidade e o controle governamental de dados biométricos no campo da



migração; **Objetivo:** analisar as implicações éticas, legais e sociais das ferramentas digitais na migração, destacando desafios e oportunidades, especialmente em relação à privacidade e à tomada de decisões orientadas por IA; **Metodologia:** Adotando uma abordagem qualitativa com metodologia documental e descritiva, foi realizada uma revisão sistemática da literatura, seguindo algumas das diretrizes PRISMA, para explorar a interseção entre tecnologia e migração a partir de várias perspectivas; **Resultados:** são revelados os desafios éticos na saúde dos migrantes, os riscos na tomada de decisões por IA, as questões legais em torno da vigilância biométrica e as preocupações com a privacidade na migração digital; **Conclusões:** Destaca a necessidade de enquadrar eticamente o uso de ferramentas digitais, garantindo a privacidade e os direitos dos migrantes e promovendo a colaboração genuína para apoiá-los em sua experiência de migração.

Palavras-chave: Direitos civis; Ética; Livre circulação; Migração; Privacidade; Tecnologias.



INTRODUCTION

The current extensive migratory movements represent a considerable challenge for humanity, constituting a problem of great magnitude, as expressed by Guillén de Romero et al. (2019). In this sense, the convergence of digital technology and contemporary migratory phenomena has given rise to a fascinating and complex field of study that requires careful exploration. This entanglement raises fundamental questions about the dynamics of human mobility, the opportunities and challenges that emerge from the interaction between technology and migration (Arthur & Smith, 2022; Roman-Acosta et al., 2023; Sánchez Suárez et al., 2023; Rodríguez Torres et al., 2024; Rodríguez Casallas et al., 2024).

Scholars have identified the use of digital platforms and social media as transformative factors in the settlement and integration of migrants, influencing various socio-political, economic, and cultural aspects (Alencar, 2017; Mantilla, 2022; Rodríguez Torres, López Gómez & Dávila Cisneros, 2023; Rodríguez Torres, López Gómez & Dávila Cisneros, 2023). Together, the development of information and communication technologies (ICTs) has coincided with the migration of specific communities, leading to the emergence of new transnational media and communication practices (Ogáyar-Marín et al., 2018). The role of digital technology in shaping migrants' experiences and access to information has also been highlighted, with particular attention to the challenges and opportunities presented by digital platforms (Leurs & Ponzanesi, 2018).

That is why, from a theoretical perspective, it is essential to understand how digital tools have permeated and transformed contemporary migration processes. Both Ventevogel (2018) and Armijos Navarro and Mejía Ama (2023), emphasize the importance of reactivating community networks to improve the well-being of people in situations of human mobility and shelter, while Millán-Franco et al. (2019) indicates that migration can generate various social and psychological repercussions, which have the potential to be alleviated through social support networks created through digital communication platforms.

For their part, Echaury and Maz (2021a) have argued that the era of disconnected migrants has shifted to that of digitally connected international migrants, emphasizing the substantial role of digital technologies in maintaining diverse connections for migrants.

The conceptualization of the difficulties associated with the analysis of digital spaces of migration proposed by Busso (2023) has highlighted the transformation of migratory practices through technology, while Wang et al. (2014) have provided insights into the reflexive nature of technology and its impact on human mobility.

Recent research has shed light on the various ways in which digital tools influence migration. Escofet (2020) study discusses how mobile technology facilitates the integration of refugees by providing access to essential resources. Echaury and Maz (2021b) explore how diasporas use digital platforms to maintain transnational connections and construct digital identities. Neag and Supa (2020) research explores the emotional practices of unaccompanied refugee youth on social media, providing insights into how these individuals use social media for emotional expression and support during their migration experiences.

In the same vein, the work of Cabalquinto & Wood-Bradley (2020) has evidenced the mediation of



transnational affective economies through digital connectivity services, providing information on the platform of migrants and their role within online commercial infrastructures and operations.

On the other hand, Meissner & Taylor's (2021) research has analysed the evidence of unproven technologies and analytical methods on migrants and refugees in precarious situations, highlighting the lack of access to redress and oversight mechanisms for them, as well as the need to include the specific concerns of migrants in the global digital rights space.

Despite progress, thematic gaps persist that deserve attention. The absence of a solid ethical framework in the use of digital tools in migration processes, highlighting inadequate living conditions in refugee camps and migrant workers' accommodations, precarious employment and the lack of inclusion of migrants in public health measures (Leurs & Smets, 2018; Cain et al., 2021; Kumar et al., 2021).

Corte-Real et al. (2022) provides a comprehensive review of the use of Blockchain technology in support of the health of migrants and refugees, addressing the lack of personal identification and offering insights into the potential applications of this technology to ensure the rights and well-being of migrants and refugees. The relationship between unequal access to technology and disparities in migration experiences is another underexplored aspect (Tjaden, 2021; Molnar, 2019; Sandberg & Rossi, 2021).

In this way, the interaction between technology and cultural aspects of migration, such as the preservation of cultural identities in digital environments, is fertile ground for future research (Bivins, 2022; Bucholtz & Skapoulli, 2022).

The main objective of this article is to identify the ethical, legal and social implications of the use of digital tools in contemporary human mobility, highlighting the challenges and opportunities inherent in the intersection between technology and migration. It seeks to address these challenges by critically analyzing the ethical, legal, and social implications of digital tools in migration, with a particular focus on privacy and AI-driven decision-making. The problematization guiding this study lies in the tension between the benefits of technological advancements in managing human mobility and the potential threats they pose to the fundamental rights of migrants.

2. METHODOLOGY

In this study, a qualitative approach and a documentary methodology supported by systematic review guidelines were employed (Codina, 2020). The framework of a documentary design was adopted, focused on the research question posed (Hurtado, 2012), common in qualitative research and literature reviews (Ávila et al., 2017; Cunias & Medina, 2021). The PRISMA methodological guideline was applied to ensure a transparent and reproducible review, with information collection carried out through documentary observation (Mishra & Mishra, 2023).

Studies that did not address the interaction between technology and migration, lacked an ethical, legal or social approach, or did not meet methodological quality standards were excluded. Five key questions were asked to guide the review:



What are the ethical implications of the use of digital tools in contemporary human mobility?

What are the legal implications associated with the intersection of technology and migration?

How does technology affect the social experience of migrants?

What are the specific challenges related to privacy in the context of digital migration?

What opportunities does technology offer to address societal challenges associated with human mobility?

The search strategy was designed to identify relevant studies in databases such as Scielo, Scopus and Web of Science, using specific search terms and time filters.

The selection of articles was carried out in several stages, with two independent reviewers, resolving disagreements through discussion and consensus. A comprehensive analysis of the findings was conducted, focusing on ethical, legal, and social implications, using a narrative synthesis approach.

This approach made it possible to identify the ethical, legal and social complexities related to the use of digital tools in contemporary migration.

3. RESULTS

By answering the first question, it has been possible to identify the ethical implications of the use of digital tools in contemporary human mobility, the studies retrieved from the various sources provide an enlightening perspective on this complex intertwining between technology and migration.

Onarheim et al. (2021) highlighted ethical concerns around migrant health policies and practices, emphasizing the ethical unacceptability of failing to provide necessary health services to migrants. Guan et al. (2022) explored ethical risks in artificial intelligence (AI) decision-making, underscoring the need for ethical governance in AI systems, especially in migration contexts.

Nesterova (2022) analysed the need for stricter regulation of biometric surveillance in the context of legislative proposals, advocating for measures that protect fundamental rights. Almpani et al. (2023) examined the rise of autonomous AI systems in ethical decision-making, emphasizing the need for formalized ethical decision-making processes, especially relevant in migration policies and human rights. Neira Orjuela (2023) and Peña (2019) highlighted ethical concerns about the collection and storage of biometric data from migrants, emphasizing the importance of safeguarding the privacy and security of such information.

The legal implications associated with the intersection between technology and migration are of paramount importance and require careful analysis to understand the complexities of contemporary human mobility. Various legal dimensions associated with this intersection have been identified.



A highlight focuses on the protection of migrants' privacy and data in digital environments. Wi-enroth and Amelung (2023) point out that surveillance technologies used in migration management raise questions about legality and respect for fundamental privacy rights, especially in relation to the collection and use of biometric data.

Another crucial aspect addresses restrictions on access to and disclosure of information relevant to migrants, generating legal tensions in terms of digital rights and access to information. Carrillo Gutierrez and Díaz Argueta (2023) analyze international standards that protect the labor rights of irregular migrants, offering perspectives on the legal challenges they face in relation to their fundamental rights, including freedom of information.

Gómez Johnson (2019) portrays the situation of structural violence in Mexico and its impact on human mobility, which can offer a perspective on the legal challenges faced by migrants in a context of violence and national security.

Likewise, Casas-Cortés and Cobarrubias (2020) examine in detail the autonomy of migration and its link to migration controls, highlighting the formation of a border that crosses vertically in Morocco. This phenomenon hinders access to the European Union, generating legal and geopolitical consequences of considerable relevance, highlighting the complexity of this emerging border as a significant obstacle for those seeking to enter the European Union.

In response to the third question about how technology affects the social experience of migrants, they reveal its crucial role in all phases of migration. Information and Communication Technologies (ICTs) provide instrumental support during the trip and allow connection with the social network of the country of origin (Ortiz-Cobo & Bianco, 2018). Social media platforms, such as WeChat, facilitate communication and integration for immigrants (Sun & Yu, 2020). In addition, technological tools support older migrants' adaptation and transform their participation in society (Nguyen et al., 2022; Sánchez-Querubín & Rogers, 2018). Dekker et al. (2018) highlight the use of social media in migration decision-making and access to essential services and information for Syrian migrants.

Equity in access to technology and overcoming language and cultural barriers are critical issues (Huamani Huaranca et al., 2023). Social networks shape migrants' social mobility strategies (Domínguez-Amorós & Suárez-Grimalt, 2022), while legal frameworks seek to ensure equity and prevent discrimination (García-Saltos & Márquez, 2022). The digital communication of migrant organizations is also the subject of study, including ethical aspects (Arévalo-Martínez & del Prado Flores, 2021).

In summary, the importance of considering the agency of migrants in the defense of their rights in the context of contemporary human mobility is highlighted (Alejo, 2020). This comprehensive perspective offers a broad view of the intersection between online social networks, legislation, digital communication, and individual agency in the context of migration.

In the field of digital migration, specific privacy-related challenges have been identified that impact the experience of migrants, generating a critical discussion on data protection and individual rights. Concerns about government surveillance in the context of migration control technologies raise questions about the protection of privacy and respect for the fundamental rights of migrants.



The use of surveillance technologies in migration management has been controversial, with implications for privacy, human rights, and democratic values (Loukinas, 2017; Wienroth & Amelung, 2023). This intersection has been recognized as a complex and multifaceted nexus, with implications for migrant empowerment and control (Nedelcu & Soysüren, 2020). In addition, the ethical implications of prioritizing the protection of citizens over individual privacy have been debated, especially in extenuating circumstances such as the COVID-19 pandemic (Bentotahewa et al., 2021).

The role of surveillance technologies in the securitization of migration policies has been examined, especially in the context of addressing traditional security threats (Sadik & Kaya, 2020). This reflects the securitization discourse around migration and the use of surveillance technologies to address security concerns. In addition, the need to consider the impact on human rights, especially on border surveillance and the invisibility of vulnerable populations, has been highlighted (Topak, 2019).

Other challenges include cybersecurity risks and threats in the digital age, as well as the protection of confidential information in digital environments, particularly in the context of data anonymization and privacy preservation techniques (Coronel Ayala & López Sevilla, 2023; Majeed & Lee, 2020).

Academic discourse has underlined the importance of addressing the ethical and methodological challenges associated with digital data collection and analysis, as well as the role of digital borders and data generation in migration management (Sandberg & Rossi, 2021; Leese et al., 2021; Tjaden, 2021).

Finally, ethical challenges related to the collection and use of biometric data in digital migration were addressed, raising questions about privacy and the potential stigmatization of these populations (Wienroth & Amelung, 2023; Norval & Prasopoulou, 2018). The need for robust privacy protection mechanisms and ethical frameworks to address the challenges associated with biometric data was emphasized, particularly in the context of migration and border control (Abomhara et al., 2020). In addition, the potential for privacy leakage and the implications of biometric technologies in the construction of widespread criminal suspicion against migrants have been discussed, shedding light on the social and ethical dimensions of the use of biometric data in migration contexts (Amelung et al., 2021).

Related to the fifth question, technology presents not only challenges but also significant opportunities to address the complex social problems associated with migratory flows. The study by Arévalo-Martínez and del Prado Flores (2021) has provided insights into the International Organization for Migration's (IOM) digital communication and its impact on supporters, highlighting the need for genuine collaboration to foster dialogue and create a supportive community for migrants.

On the other hand, Mantilla's (2022) research has investigated digital solidarity and the use of digital technologies among Venezuelan citizens in Quito, Ecuador, emphasizing the enrichment of migrants' social relations through digital communication. This is pertinent as it sheds light on the positive impact of digital communication on the social well-being of migrants.

Pavez et al. (2020) have delved into the use of social media by Colombian migrants in Chile, highlighting the potential of technological developments and digital mobility to enable migrants to maintain contact with their communities of origin and preserve their practices and traditions.

Merisalo & Jauhiainen (2020) have studied the use of social media by asylum-related migrants and



their relationship with mobility and resilience, highlighting the potential of digital platforms in supporting migrants' adaptation and resilience, while Latonero & Kift (2018) have examined the impact of digital passages and borders on refugees, providing perspectives on the intersection of human rights and digital technology in the context of migration.

4. DISCUSSION

To synthesize the information collected by research and its valuable contributions, a table is presented where we indicate title, author and year of publication, the database where the research is published, the level of relevance linked to the objective of this research, a brief synthesis and contribution and the methodological approach of the same.

Table 1
Structuring and composition of the identified articles

Title, authors and year	Database	Level of relevance	Synthesis and contribution	Research Focus
Onarheim et al. (2021)	Scopus	Casualty	Ethical concerns surrounding migrant health policies and practices.	Qualitative
Neag & Supa (2020)	Scopus	High	Ethnographic analysis of social networks in young unaccompanied migrants, description of their emotional involvement in new environments and their expression in social networks.	Qualitative
Echauri & Maz (2021a)	Web of Science	Stocking	Descriptive ethnographic analysis of how the interaction of young migrants in social networks occurs in higher education contexts.	Qualitative
Guan et al. (2022)	Scopus	High	Ethical analysis and identification of risk factors in the use of AI in decision-making.	Qualitative
Almpani et al. (2023)	Scopus	High	Presentation of a logic proof calculation model to ensure ethical behavior of technological systems using AI.	Quantitative
Wienroth (2023)	Scopus	High	Description of the use of biometric technology in its transition from the protection of national security and its ethical link with the control of migration by the state.	Qualitative
Carrillo Gutierrez & Díaz Argueta (2023)	Web of Science	Middle	Analysis and documentary review of international laws binding on migrant labor law.	Qualitative
Gómez Johnson (2019)	Scielo	Stocking	Documentary and hemerographic analysis of reports of structural violence suffered by migrants traveling through Mexican territory.	Qualitative
Casas-Cortés & Cobarrubias (2020)	Scopus	Stocking	Synthesis of the school of thought "Autonomy of migration" and case study of the Morocco border.	Qualitative
Ortiz-Cobo & Bianco (2018)	Scopus	Stocking	Ethnographic research on the use of technology in the social interaction of migrants with their place of origin and their place of reception, which is mainly observable on Facebook, highlighting the expansion of social capital by providing emotional support to migrants.	Qualitative
Sun & Yu (2020)	Scopus	High	Ethnographic analysis, conducting surveys and interviews via digital on WeChat in relation to civic education and leadership training of Chinese migrants in Australia.	Qualitative
Sánchez-Querubín & Rogers (2018)	Scopus	Low	A case study of the Getty Images and Tripadvisor websites as a reference model or media guides for migrants on their journeys.	Qualitative



Title, authors and year	Database	Level of relevance	Synthesis and contribution	Research Focus
Dekker et al. (2018)	Scopus	High	In-depth interviews with 54 migrants of Syrian origin in Europe, which show the importance of using social networks before and during their asylum process in the Netherlands.	Qualitative
Huamani Huaranca et al. (2023)	Scielo	High	Analysis with a focus on social, psychological and cultural factors that facilitate the integration of young students with ICT in university environments.	Quantitative/ Qualitative
Domínguez-Amorós & Suárez-Grimalt (2022)	Scielo	High	Ethnographic analysis of migrant families of Brazilian origin in Spain, where relevance is given to the social capital assets obtained through the use of social networks.	Qualitative
García Saltos & Márquez (2022)	Scielo	High	Analysis of the legal agreements between the population and states in order to guarantee the evolution of the rights of migrants and their exit from clandestinity in the context of the pandemic.	Qualitative
Arévalo-Martínez & Prado Flores (2021)	Scopus	High	Analysis and measurement of posts and interactions on Facebook and Twitter between IOM and users, highlighting the lack of substantive collaboration between the parties that would allow for a true community of support for migrants.	Quantitative
Alejo (2020)	Web of Science	Middle	Proposal for a model of migrant diplomacy in the environments of binational organizations in the United States. Promoting the transcendence of the rights of communities that can be deported or returned.	Qualitative
Wienroth (2023), Loukinas (2017)	Web of Science	High	Analysis of the ethical implications in the use of biometric data and how its evolution from forensic criminological analysis to the care of migrant populations is characterized by social practices of crime management.	Qualitative.
Nedelcu & Soysüren, (2020)	Scopus	High	Documentary analysis carried out to show the multifaceted nature of the use of technologies among migrant communities and their dialectical interaction with the power or institutions that serve these populations.	Qualitative
Bentotahewa et al. (2021)	Scielo	High	Analysis of the management of Big Data by state or private institutions in the context of COVID-19, as well as proposals for the ethical management of data and privacy in the different countries.	Qualitative/ Quantitative
Sadik & Kaya, (2020)	Scopus	High	Critical analysis of the securitisation policies implemented by EU member countries. These policies suggest contradictions in the face of their founding principles and foresee serious problems for the international image and migratory control in these countries.	Qualitative
Topak (2019)	Scielo	Middle	Study on counter-surveillance activities carried out by humanitarian organisations in the context of migration at the EU's borders. It demonstrates how human rights are violated by the states that guard their borders.	Qualitative
Colonel Ayala & López Sevilla (2023)	Web Of Science	High	Documentary analysis of studies that demonstrate the increase in cyberattacks and how societies remain at exponential risk of being victims due to the lack of data protection policies	Qualitative
Majeed & Lee (2020), Schönig et al. (2019)	Scielo	High	This is a study that offers an algorithm model that seeks to prevent information theft using methods of generalization and segmentation by attributes of people. It allows for a better handling of the privacy of web portal consumers.	Quantitative
Sandberg & Rossi, (2021), Leurs (2021)	Scopus	Middle	In-depth analysis of the ethical and methodological challenges faced by migration researchers and their relationship with big data, as well as sources consulted on the web.	Qualitative
Leese et al. (2021), Tjaden, (2021)	Web Of Science	High	This study demonstrates the importance of data management in social networks and the internet in general and its impact on the use of digital borders by governments. A study that demonstrates the importance of ethical data management and exposed privacy at global levels.	Qualitative



Title, authors and year	Database	Level of relevance	Synthesis and contribution	Research Focus
Abomhara et al. (2020).	Scopus	Middle	Analysis of the ethical, social and legal challenges arising from the use of biometric technology at EU border posts and how they do not guarantee the privacy and data breach of migrants. At the same time, proposals are made to improve this relationship.	Qualitative/ Quantitative
Amelung et al. (2021)	Scielo	High	Historical descriptive analysis of migration control models in the EU and how progress has been made to date in a kind of criminalization of migration with the use of technologies from security agencies and forensic sciences.	Qualitative
Mantilla (2022)	Scielo	High	Study of interactions on social networks such as Whatsapp among Venezuelans in Quito, Ecuador, characterizing the practices of digital solidarity, denoting co-presence, emotional support between acquaintances and forming new impersonal and massive bonds in the case of unknown people.	Qualitative
Pavez et al. (2020)	Scopus	High	Research carried out through in-depth interviews with Colombian migrants in Chile, where it is evident that the use of Whatsapp was essential to maintain synchronous and asynchronous communication with relatives, giving continuity to family roles and traditions. Controlling and managing your it when and how to communicate.	Qualitative
Merisalo & Jauhiainen (2020)	Scopus	High	Study conducted using semi-structured interviews with migrants in the EU seeking asylum. It demonstrates how the use of social networks has been useful for decision-making about destinations to emigrate and in turn to maintain links with people and families in countries of origin, providing context for resilience and emotional support.	Quantitative/ Qualitative
Latonero & Kift (2018)	Scielo	Middle	Historical-documentary analysis between 2014 and 2018 describing the use of technologies by migrant communities in the EU and governments. It questions the ethical implications that underlie this relationship.	Qualitative
Nteliou et al. (2021)	Scopus	High	Descriptive and exploratory study on the benefits of the EasyRights project, which facilitates the insertion of migrants in new territories where they encounter difficulties with language and job opportunities through the use of technologies. Thus, allowing the adequate adaptation of families and individuals to the new spaces.	Qualitative

5. CONCLUSIONS

This study has revealed that the use of digital tools in contemporary human mobility carries significant ethical, legal and social implications. Through a qualitative analysis of the literature, critical risks associated with the management of biometric data and surveillance technologies were identified, which can compromise the privacy and rights of migrants. It was also observed that, although these technologies facilitate certain aspects of the migration process, they can be used for the control and criminalization of migrants, thus complicating their migration experiences.

The findings underline the urgent need to develop more robust ethical and legal frameworks that regulate the use of digital technologies in migration contexts, ensuring that fundamental human rights are respected. These results highlight the importance of an ongoing debate on privacy and government control in a context where advanced technologies become increasingly intrusive in the lives of migrants.

Future research should focus on evaluating specific policies and practices that implement these



technologies in migration management, in order to identify best practices and mitigate the identified risks. It is essential to explore how to design and use these tools to empower migrants, rather than undermine them, ensuring that the use of technology in migration is aligned with sound ethical principles and respect for human rights.

Conflicts of interest

The authors declare that there is no conflict of interest.



References

- Abomhara, M., Yayilgan, S.Y., Nymoen, A.H., Shalaginova, M., Székely, Z. & Elezaj, O. (2020). How to Do It Right: A Framework for Biometrics Supported Border Control. In: Katsikas, S., Zorkadis, V. (Eds) *E-Democracy – Safeguarding Democracy and Human Rights in the Digital Age. e-Democracy 2019*. Springer. https://doi.org/10.1007/978-3-030-37545-4_7
- Alejo, A. (2020). Diplomacias migrantes: Repensando la binacionalidad cívica en Norteamérica. *Migraciones. Publicación Del Instituto Universitario De Estudios Sobre Migraciones*, (48), 105–131. <https://doi.org/10.14422/mig.i48y2020.005>
- Alencar, A. (2017). Refugee integration and social media: a local and experiential perspective. *Information Communication and Society*, 21(11), 1588–1603. <https://doi.org/10.1080/1369118x.2017.1340500>
- Almpani, S., Stefaneas, P. & Frangos, P. (2023). Formalization of ethical decision making. *International Journal of Extreme Automation and Connectivity in Healthcare*, 5(1), 1–13. <https://doi.org/10.4018/ijeach.320488>
- Amelung, N., Granja, R. & Machado, H. (2021). A Brief History of the Evolution of Biometrics and Biometric Database Systems Crossing Borders in EU Law Enforcement. In: *Modes of Bio-Bordering. Modes of Bio-Bordering. The Hidden (Dis)integration of Europe. Singapore*. https://doi.org/10.1007/978-981-15-8183-0_2
- Arévalo-Martínez, R. I. & del Prado Flores, R. (2021). Comunicación digital de la Organización Internacional para las Migraciones: de la presencia a la colaboración. *Anuario Electrónico De Estudios En Comunicación Social "Disertaciones"* 14(2), 1–25. <https://doi.org/10.12804/revistas.urosario.edu.co/disertaciones/a.10389>
- Armijos Navarro, A. V. & Mejía Ama, J. R. (2023). Movilidad humana: “Riesgos y respuestas de protección para la población en situación de movilidad humana y refugio en el contexto de la pandemia COVID-19 en Ecuador”. *Tsafiqui - Revista Científica En Ciencias Sociales*, 13(1). <https://doi.org/10.29019/tsafiqui.v13i20.1138>
- Arthur, P. L. & Smith, I. (2022). Human journeys in the digital age: Advances and challenges in Digital Historical Migration Studies. *Frontiers in Human Dynamics*, 4, 915978. <https://doi.org/10.3389/fhumd.2022.915978>
- Ávila, C., Higuera, M. & Soler, R. (2017). Lectura Crítica. Definiciones, experiencias y posibilidades. *Saber, Ciencia Y Libertad*, 12(2), 184–197. <https://doi.org/10.18041/2382-3240/saber.2017v12n2.1586>
- Bentotahewa, V., Hewage, C. & Williams, J. (2021). Solutions to big data privacy and security challenges associated with COVID-19 surveillance systems. *Frontiers in big Data*, 4, 645204. <https://doi.org/10.3389/fdata.2021.645204>
- Bivins, R. (2022). Forgone, not forgotten: “dna fingerprinting,” migration control and britain’s dna profiling pilot project. *Science Technology and Human Values*, 016224392211398. <https://doi.org/10.1177/01622439221139877>
- Bucholtz, M. & Skapoulli, E. (2022). Introduction youth language at the intersection. *Pragmatics Quarterly Publication of the International Pragmatics Association (Ipra)*, 19(1), 1–16. <https://doi.org/10.1075/prag.19.1.01buc>
- Busso, M. (2023). Migrations, Mediatization and Digital Spaces: On the Configurations of Mobility in Research. *Mediations*, 30(19), 142–154. <https://doi.org/10.26620/uniminuto.mediaciones.19.30.2023.142-154>
- Cabalquinto, E. & Wood-Bradley, G. (2020). Migrant platformed subjectivity: rethinking the mediation of transnational affective economies via digital connectivity services. *International Journal of Cultural Studies*, 23(5), 787–802. <https://doi.org/10.1177/1367877920918597>
- Cain, P., Daly, A. & Reid, A. (2021). How refugees experience the australian workplace: a comparative mixed methods study. *International Journal of Environmental Research and Public Health*, 18(8), 4023. <https://doi.org/10.3390/ijerph18084023>
- Carrillo Gutierrez, P. & Díaz Argueta, J. C. (2023). Derechos laborales de los migrantes en situación irregular. *Justicia*,



28(44), 1-14. <https://doi.org/10.17081/just.28.44.6713>

- Casas-Cortés, M. & Cobarrubias, S. (2020). La autonomía de la migración: Una perspectiva alternativa sobre la movilidad humana y los controles migratorio. *EMPIRIA. Revista de Metodología de Ciencias Sociales*, (46), 65-92. <https://doi.org/10.5944/empiria.46.2020.26967>
- Codina, L. (2020). Cómo hacer revisiones bibliográficas tradicionales o sistemáticas utilizando bases de datos académicas. *Revista ORL*, 11(2), 139-153. <https://doi.org/10.14201/orl.22977>
- Coronel Ayala, F. M. & López Sevilla, G. M. (2023). Mapeo del panorama actual de la ciberseguridad en la era moderna digital *RECIMUNDO*, 7(2), 441-452. [https://doi.org/10.26820/recimundo/7.\(2\).Jun.2023.441-452](https://doi.org/10.26820/recimundo/7.(2).Jun.2023.441-452)
- Corte-Real, A., Nunes, T. & Cunha, P. (2022). Blockchain technology in migrant and refugee health: a scoping review. *Journal of Global Health*, 12. <https://doi.org/10.7189/jogh.12.04047>
- Cunias, M. & Medina, I. (2017). NIVEL DE LECTURA CRÍTICA EN ESTUDIANTES DE LA UNIVERSIDAD SEÑOR DE SIPÁN - MODALIDAD EXPERIENCIA LABORAL 2019 - II. (2021). *Hacedor - AIAPÆC*, 5(1), 1-15. <https://doi.org/10.26495/rch.v5i1.1612>
- Dekker, R., Engbersen, G., Klaver, J. & Vonk, H. (2018). Smart refugees: How Syrian asylum migrants use social media information in migration decision-making. *Social Media+ Society*, 4(1), 2056305118764439. <https://doi.org/10.1177/2056305118764439>
- Domínguez-Amorós, M. & Suárez-Grimalt, L. (2022). Network Mobility: An Analysis of the Interrelationship between Social Mobility and Social Capital for Transnational Households of Brazilian Origin. *Dice*, 65(4), e20200355. <https://doi.org/10.1590/dados.2022.65.4.272>
- Echauri, G. & Figueras-Maz, M. (2021a). Digital Interactions in a Transnational Context: Communicative Practices of International Students in Barcelona. *Dixit*, (35), 71-82. <https://doi.org/10.22235/d35.2471>
- Echauri, G. & Figueras-Maz, M. (2021b). Temporary migration and use of social networks by international university students in Catalonia. *Digital Work*, (20). <https://doi.org/10.25029/od.2021.307.20>
- Escofet, A. (2020). Aprendizaje-servicio y tecnologías digitales: ¿una relación posible? *RIED. Revista Iberoamericana de Educación a Distancia*, 23(1), 169-182. <https://doi.org/10.5944/ried.23.1.24680>
- García-Saltos, C. D. & Márquez, J. A. (2022). La movilidad humana en tiempos de pandemia. *Revista Latinoamericana De Derechos Humanos*, 34(1), 265-284. <https://doi.org/10.15359/rldh.34-1.8>
- Gomez Johnson, C. (2019). Huir para no morir: movilidad humana en contexto de violencia sostenida. El caso mexicano. *Historia y grafía*, (52), 57-95. <https://www.scielo.org.mx/pdf/hg/n52/1405-0927-hg-52-57.pdf>
- Guan, H., Liye, D. & Zhao, A. (2022). Ethical risk factors and mechanisms in artificial intelligence decision making. *Behavioral Sciences*, 12(9), 343. <https://doi.org/10.3390/bs12090343>
- Guillén de Romero, J. C., Menéndez Menéndez, F. G. & Moreira Chica, T. K. (2019). Migración: Como fenómeno social vulnerable y salvaguarda de los derechos humanos. *Revista De Ciencias Sociales*, 25, 281-294. <https://doi.org/10.31876/rsc.v25i1.29619>
- Huamani Huaranca, N. O., Huamani Huaranca, L. J., Pinto de Alarcón, J. A. & Cedeño Macías, A. M. (2023). TIC en Universidades Públicas de Tres Países de la Comunidad Andina de Naciones durante el COVID-19. *Comuni@cción: Revista De Investigación En Comunicación Y Desarrollo*, 14(1), 41-54. <https://doi.org/10.33595/2226-1478.14.1.805>
- Hurtado de Barrera, J. (2012). *Metodología de la investigación Holística*. Quiron Editions.
- Kumar, B., Hargreaves, S., Agyemang, C., James, R., Blanchet, K. & Gruer, L. (2021). Reducing the impact of the coronavirus on disadvantaged migrants and ethnic minorities. *European Journal of Public Health*, 31(Supplement_4),



iv9-iv13. <https://doi.org/10.1093/eurpub/ckab151>

- Latonero, M. & Kift, P. (2018). On digital passages and borders: refugees and the new infrastructure for movement and control. *Social Media + Society*, 4(1), 205630511876443. <https://doi.org/10.1177/2056305118764432>
- Leese, M., Noori, S. & Scheel, S. (2021). Data matters: the politics and practices of digital border and migration management. *Geopolitics*, 27(1), 5-25. <https://doi.org/10.1080/14650045.2021.1940538>
- Leurs, K. & Ponzanesi, S. (2018). Connected migrants: Encapsulation and cosmopolitanization. *Popular communication*, 16(1), 4-20. <https://doi.org/10.1080/15405702.2017.1418359>
- Leurs, K. & Smets, K. (2018). Five questions for digital migration studies: learning from digital connectivity and forced migration in(to) europe. *Social Media + Society*, 4(1), 205630511876442. <https://doi.org/10.1177/2056305118764425>
- Loukinas, P. (2017). Surveillance and drones at greek borderzones: challenging human rights and democracy. *Surveillance and Society*, 15(3/4), 439-446. <https://doi.org/10.24908/ss.v15i3/4.6613>
- Majeed, A. & Lee, S. (2020). Attribute susceptibility and entropy-based data anonymization to improve users' community privacy and utility in publishing data. *Applied Intelligence*, 50(8), 2555-2574. <https://doi.org/10.1007/s10489-020-01656-w>
- Mantilla, J. (2022). Solidaridad digital y migraciones: análisis sobre el uso de tecnologías digitales entre ciudadanos venezolanos en Quito, Ecuador. *Estudios fronterizos*, 23, e102. <https://doi.org/10.21670/ref.2218102>
- Meissner, F. & Taylor, L. (2021). *Migration information infrastructures: power, control and responsibility at a new frontier of migration research*. <https://doi.org/10.31235/osf.io/gkzmq>
- Merisalo, M. & Jauhiainen, J. (2020). Asylum-related migrants' social-media use, mobility decisions, and resilience. *Journal of Immigrant and Refugee Studies*, 19(2), 184-198. <https://doi.org/10.1080/15562948.2020.1781991>
- Millán-Franco, M., Gómez-Jacinto, L., Hombrados-Mendieta, M. I. & García-Cid, A. (2019). Las redes de apoyo social online y offline en los inmigrantes de Málaga (España). *Migraciones. Publicación Del Instituto Universitario De Estudios Sobre Migraciones*, (47), 119-149. <https://doi.org/10.14422/mig.i47y2019.005>
- Mishra, V. and Mishra, M.P. (2023). PRISMA for Review of Management Literature – Method, Merits, and Limitations – An Academic Review. Rana, S., Singh, J. and Kathuria, S. (Ed.) *Advancing Methodologies of Conducting Literature Review in Management Domain (Review of Management Literature, Vol. 2)*, Emerald Publishing Limited, Leeds, pp. 125-136. <https://doi.org/10.1108/S2754-586520230000002007>
- Molnar, P. (2019). Technology on the margins: ai and global migration management from a human rights perspective. *Cambridge International Law Journal*, 8(2), 305-330. <https://doi.org/10.4337/cilj.2019.02.07>
- Neag, A. & Supa, M. (2020). Emotional practices of unaccompanied refugee youth on social media. *International Journal of Cultural Studies*, 23(5), 766-786. <https://doi.org/10.1177/1367877920929710>
- Nedelcu, M. & Soysüren, I. (2020). Precarious migrants, migration regimes and digital technologies: the empowerment-control nexus. *Journal of Ethnic and Migration Studies*, 48(8), 1821-1837. <https://doi.org/10.1080/1369183x.2020.1796263>
- Neira Orjuela, F. (2023). *Las tecnologías biometricas en la migración latinoamericana: el caso de Chile, Colombia y México*. Ediciones Eón. <http://www.librosoa.unam.mx/bitstream/handle/123456789/3658/9786073074803.pdf?sequence=1&isAllowed=y>
- Nesterova, I. (2022). Questioning the eu proposal for an artificial intelligence act: the need for prohibitions and a stricter approach to biometric surveillance. *Information Polity*, 27(2), 147-162. <https://doi.org/10.3233/ip-211524>



- Nguyen, H., Baldassar, L. & Wilding, R. (2022). Lifecourse transitions: how icts support older migrants' adaptation to transnational lives. *Social Inclusion*, 10(4). <https://doi.org/10.17645/si.v10i4.5735>
- Norval, A. & Prasopoulou, E. (2018). Seeing like a citizen: exploring public views of biometrics. *Political Studies*, 67(2), 367-387. <https://doi.org/10.1177/0032321718766736>
- Nteliou, E., Koreman, J., Tolskaya, I. & Kehagia, O. (2021). Digital Technologies Assisting Migrant Population Overcome Language Barriers: The Case of the Easy Rights Research Project. In: Zaphiris, P., Ioannou, A. (eds) *Learning and Collaboration Technologies: New Challenges and Learning Experiences*. Lecture Notes in Computer Science, vol 12784. Springer, Cham. https://doi.org/10.1007/978-3-030-77889-7_8
- Ogáyar Marín, F. J., Muntean, V. & Gamella, J. F. (2018). Redes sociales digitales en la migración transnacional romá de Rumanía. Una polymedia transnacional. *Revista de humanidades*, 35. 107-136. DOI: 10.5944/rdh.35.2018.19813
- Onarheim, K. H., Wickramage, K., Ingleby, D., Subramani, S. & Miljeteig, I. (2021). Adopting an ethical approach to migration health policy, practice and research. *BMJ Global Health*, 6(7), e006425. <https://doi.org/10.1136/bmjgh-2021-006425>
- Pavez Andonaegui, I., Claro Montes, C. & Burgos Suárez, J. A. (2020). El uso de redes sociales en migrantes colombianos en Chile. *Signo Y Pensamiento*, 39(76). <https://doi.org/10.11144/Javeriana.syp39-76.ursm>
- Peña, S. (2019). Narrativas de reforzamiento de la frontera: El rol del saber y el poder de las comunicaciones. *Estudios Fronterizos*. 20, e027. <https://doi.org/10.21670/ref.1906027>
- Rodríguez Casallas, D. F., Páez Moreno, Ángel E., Román Acosta, D. & Rodríguez Torres, E. (2024). Participación ciudadana, gobernanza democrática y derecho al desarrollo: una revisión sistemática. *Telos: Revista de Estudios Interdisciplinarios en Ciencias Sociales*, 26(1), 198-214. www.doi.org/10.36390/telos261.13
- Rodríguez Torres, E., Dávila Cisneros, J. & Gómez Cano, C. (2024). La formación para la configuración de proyectos de vida: una experiencia mediante situaciones de enseñanza-aprendizaje. *Varona. Revista Científico Metodológica*, (79) http://scielo.sld.cu/scielo.php?pid=S1992-82382024000100007&script=sci_abstract
- Rodríguez Torres, E., López Gómez, H. E. & Dávila Cisneros, J. D. (2023). Importancia de los semilleros estudiantiles en las universidades, para la investigación científica. *Negonotas Docentes*, (22), 50-62. <https://doi.org/10.52143/2346-1357.886>
- Rodríguez Torres, E., Pérez Gamboa, A. J. & Camejo Pérez, Y. (2023). Distributed leadership education in the intervention in favor of the cultural heritage. *Transformation*, 19(2), 317-336. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2077-29552023000200317&lng=es&tlng=en
- Roman-Acosta, D., Caira-Tovar, N., Rodríguez-Torres, E. & Pérez Gamboa, A. J. (2023). Effective leadership and communication strategies in disadvantaged contexts in the digital age. *Health, Science and Technology - Lecture Series*, 2, 532. <https://doi.org/10.56294/sctconf2023532>
- Sadik, G. & Kaya, C. (2020). The Role of Surveillance Technologies in the Securitization of EU Migration Policies and Border Management *Uluslararası İlişkiler-International Relations*, 17(68). <https://doi.org/10.33458/uidergisi.856932>
- Sánchez Suárez, Y., Pérez Gamboa, A. J., Hernández Nariño, A., Díaz-Chieng, L. Y., Marqués León, M., Pancorbo Sandoval, J. A. & Rodríguez Torres, E. (2023). Hospital culture and social responsibility: a mixed study of the main lines for its development. *Health, Science and Technology - Lecture Series*, 2, 451. <https://doi.org/10.56294/sctconf2023451>
- Sánchez-Querubín, N. & Rogers, R. (2018). Connected routes: Migration studies with digital devices and platforms. *Social Media+ Society*, 4(1), 2056305118764427. <https://journals.sagepub.com/doi/pdf/10.1177/2056305118764427>
- Sandberg, M. & Rossi, L. (2021). Caring for (big) data: an intro-



duction to research methodologies and ethical challenges in digital migration studies. Research methodologies and ethical challenges in digital migration studies. *Palgrave Macmillan, Cham* https://doi.org/10.1007/978-3-030-81226-3_1

Sun, W. & Yu, H. (2020). Wechatting the Australian election: mandarin-speaking migrants and the teaching of new citizenship practices. *Social Media + Society*, 6(1). <https://doi.org/10.1177/2056305120903441>

Tjaden, J. (2021). Measuring migration 2.0: a review of digital data sources. *Comparative Migration Studies*, 9(1), 59. <https://doi.org/10.1186/s40878-021-00273-x>

Topak, Ö. E. (2019). Humanitarian and human rights surveillance: the challenge to border surveillance and invisibility? *Surveillance and Society*, 17(3/4), 382-404. <https://doi.org/10.24908/ss.v17i3/4.10779>

Ventevogel, P. (2018). Interventions for mental health and psychosocial support in complex humanitarian emergencies: moving towards consensus in policy and action? *Mental Health of Refugee and Conflict-Affected Populations*, 155-180. https://doi.org/10.1007/978-3-319-97046-2_8

Wang, X., Xiao, H. & Wang, B. (2014). Correlations and scaling laws in human mobility. *Plos One*, 9(1), e84954.

Wienroth, M. & Amelung, N. (2023). Crisis', control and circulation: Biometric surveillance in the policing of the 'cimmigrant other. *International Journal of Police Science and Management*, 25(3), 297-312. <https://doi.org/10.1177/14613557231184696>

