

From Practitioner to Professional: Harnessing Artificial Intelligence for Inclusive Disability Models

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Abstract- The landscape of disability advocacy and policy has evolved considerably over recent decades yet prevailing theoretical frameworks have struggled to adequately address the multi-dimensional, intersectional, and systemic nature of lived disability experiences. The transition from practitioner-level engagement to fully realized professional praxis requires the deliberate integration of innovative conceptual tools, among which artificial intelligence (AI) and machine learning represent a transformative frontier. This paper develops a comprehensive theoretical framework for inclusive disability models that centres AI as a structural mechanism for advancing equity, agency, and systemic accessibility. Drawing upon a review of disability studies literature, critical AI ethics scholarship, and human rights jurisprudence, the paper identifies four persistent gaps in existing frameworks: the fragmentation between impairment and societal exclusion, the neglect of strength-based and resilience-centred perspectives, the underrepresentation of intersectional identity, and the failure to engage with technological developments as sites of both risk and possibility. In response, the paper proposes four interrelated theoretical models: the Holistic Inclusion Model 2.0, the Resilience and Potential Model with AI Insights, the Ecosystem Model Enhanced by AI, and the Transformative Justice Model through AI Advocacy. Each model is theoretically grounded and positioned within current scholarly debates. The paper concludes by articulating a research agenda for empirical testing of these frameworks through participatory, community-based methodologies.

Index Terms- Artificial Intelligence, Disability Models, Holistic Inclusion, Transformative Justice, Assistive Technology, Resilience, Intersectionality, Human Rights.

I. INTRODUCTION

Disability is among the most complex and contested categories in social, legal, and clinical discourse. It intersects with race, gender, socio-economic position,

geography, and age in ways that resist reduction to any single explanatory framework. For much of the twentieth century, the dominant lens through which disability was understood—by governments, healthcare systems, and even some advocacy movements—was the medical model, which located disability within the individual body as a problem to be diagnosed, managed, or cured (Oliver, 2013). This model, while influential, systematically obscured the structural and environmental dimensions of disablement, and in doing so, often reinforced stigma and exclusion.

The emergence of the social model of disability in the 1970s and 1980s marked a decisive epistemic shift. Disability, under this account, was produced not by individual impairment but by the failure of society to accommodate human variation (Barnes & Mercer, 2010). The social model opened transformative possibilities for advocacy and policy, culminating—at least in parting landmark legal instruments such as the United Nations Convention on the Rights of Persons with Disabilities (CRPD). The CRPD, in turn, gave rise to what Degener (2016) characterises as the human rights model of disability, which situates equality, dignity, and self-determination as foundational principles that go beyond the social model's critique of barriers to affirm the full legal personhood of disabled individuals.

Yet despite these advances, significant lacunae remain in how disability is theorised and operationalized in professional practice. The interplay between individual impairment experience and societal exclusion remains theoretically underdeveloped (Burchardt, 2004). Strength-based and resilience-centred perspectives, though increasingly articulated in rehabilitation and social

work literature, have not been systematically integrated into overarching disability frameworks. Intersectionality—the recognition that disability is experienced through and with race, gender, class, and other social locations—has been named but insufficiently theorised within mainstream disability models. Perhaps most urgently, the rapid emergence of artificial intelligence as a pervasive force shaping healthcare, employment, social benefit allocation, and civic life has outpaced the capacity of existing frameworks to engage with it critically and constructively (Newman-Griffis et al., 2023; El Morr et al., 2024).

This paper argues that the transition from practitioner to professional in the disability field requires, among other things, the development of new theoretical tools adequate to the present technological and social moment. The integration of AI into disability frameworks is not merely a technical matter; it is a theoretical, ethical, and political imperative. AI can reproduce ableist assumptions at scale when disability is poorly conceptualised in its design—a dynamic that Newman-Griffis et al. (2023) demonstrate persuasively in their analysis of how disability model choice drives consequential AI design decisions. Conversely, when disability is engaged with rigorously, inclusively, and in participatory partnership with disabled communities, AI offers substantial potential to advance access, agency, and justice.

The paper proceeds as follows. Section 2 reviews the foundational disability models and their theoretical contributions and limitations. Section 3 examines the role of AI in transforming our understanding of disability and in reshaping the policy and practice landscape. Section 4 proposes four innovative theoretical models that integrate AI as a structural and transformative element. Section 5 discusses the implications of these models for professional practice and policy, including the ethical challenges they raise. Section 6 concludes with a research agenda oriented toward participatory empirical development of the proposed frameworks

II. REVIEW OF LITERATURE

Historical and Conceptual Models of Disability

The history of disability conceptualisation is a history of contestation over the location of the problem—within the individual, within society, within relationships, or within systems of power. The moral model, which regarded disability as divine punishment or the manifestation of personal moral failing, has left enduring traces in cultural attitudes, particularly in societies where religious frameworks continue to shape social responses to disability (Shakespeare, 2006). While the moral model has been displaced from formal policy and professional discourse, its residue persists in practices of charity, pity, and paternalism that continue to characterise many disability services.

The medical model represented an important—if ultimately insufficient—advance on the moral model in that it displaced supernatural causation in favour of clinical explanation. Under the medical model, disability becomes a diagnosed condition, and the appropriate response is medical intervention: treatment, rehabilitation, or cure (Oliver, 2013). The model produced genuine improvements in healthcare access for disabled people and drove innovation in assistive and rehabilitative technologies. Its limitations, however, are well-documented: by locating the problem in the individual body, it systematically depoliticised disability, rendering structural exclusion invisible and positioning disabled people as passive recipients of professional care rather than as rights-bearing subjects.

The social model of disability, associated with the Union of the Physically Impaired Against Segregation in the United Kingdom and subsequently elaborated by scholars such as Barnes and Mercer (2010) and Oliver (2013), reoriented the analytical lens toward the socially constructed barriers that prevent full participation by people with impairments. On this account, it is not impairment per se that causes disability but the failure of social institutions, built environments, communication systems, and cultural attitudes to accommodate human diversity. The social model proved enormously generative for disability politics and

rights advocacy, providing a clear framework for identifying and contesting discriminatory barriers.

The human rights model, as articulated in the CRPD and elaborated by Degener (2016), extends the social model by anchoring disability rights within the architecture of international human rights law. The CRPD enshrines principles of dignity, autonomy, non-discrimination, full participation, accessibility, and equality of opportunity, and its Optional Protocol provides a mechanism for individual complaints. Degener (2016) argues that the human rights model goes beyond the social model's focus on removing barriers to affirm the positive entitlements of disabled persons—to legal capacity, to supported decision-making, to reasonable accommodation, and to participation in political and cultural life. This model has fundamentally reshaped international and domestic disability policy.

Persistent Gaps in Existing Frameworks

Despite the cumulative progress represented by these models, several persistent gaps limit their theoretical and practical adequacy. Burchardt (2004) identifies a fragmentation in how the relationship between impairment and societal exclusion is theorised. While the social model's insistence that disability is socially produced was a necessary corrective to medical reductionism, it has sometimes resulted in the subordination of impairment experience to structural analysis—a tendency that disabled feminist scholars have critiqued for erasing the embodied dimensions of living with chronic illness, pain, or cognitive difference. A theoretically adequate framework must hold together the structural and the experiential without reducing either to the other.

A second significant gap concerns the treatment of resilience, strengths, and agency within disability frameworks. Disability studies have necessarily focused significant attention on oppression, exclusion, and structural barriers, and this focus remains essential. However, there is a growing body of scholarship that argues for the complementary integration of strength-based perspectives—recognising the adaptive capacities, community resources, and self-determined strategies through which disabled people navigate and transform their circumstances. This is not a return to individualizing

narratives of inspiration or overcoming; it is a recognition that theoretical frameworks oriented solely around deficit and exclusion fail to capture the full range of disabled experience and risk reproducing paternalistic assumptions.

A third gap concerns intersectionality. Disability does not exist in isolation from other axes of social position and experience. Race, gender, sexuality, class, age, and migration status all shape how disability is experienced, how disability-related services and exclusions are distributed, and how disability rights are—or are not—exercised. Disability studies literature has increasingly engaged with intersectionality as a theoretical framework, but its integration into operational disability models remains incomplete.

Finally, and most urgently for the purposes of this paper, existing disability models have not yet developed adequate theoretical resources for engaging with AI. This is not simply a matter of incorporating new tools into existing frameworks. As Newman-Griffis et al. (2023) demonstrate, the conceptual model of disability that is embedded—often implicitly—in the design of AI systems shapes the kinds of data collected, the uses to which the technology is put, and the outcomes it generates. AI systems built on medical model assumptions will tend to reproduce medical model outcomes; systems built on social model principles will generate different questions and different data. The absence of an explicit, theoretically coherent engagement with AI in disability frameworks thus leaves the field vulnerable to the unreflective embedding of ableist assumptions in an increasingly AI-mediated world.

III. THE ROLE OF ARTIFICIAL INTELLIGENCE IN TRANSFORMING DISABILITY FRAMEWORKS

Defining AI and Its Relevance to Disability

Artificial intelligence, in a broad sense relevant to disability theory and practice, refers to computational systems capable of performing tasks that typically require human intelligence—pattern recognition, natural language processing, prediction, and decision support. Its most significant current forms include machine learning (in which systems improve their

performance through exposure to data), deep learning (which uses multilayered neural networks to identify complex patterns), and natural language processing (which enables machines to understand and generate human language). These technologies are now embedded in healthcare diagnostic systems, social benefit assessment algorithms, employment screening tools, educational platforms, and accessibility applications—all domains of central importance to disabled people.

The relevance of AI to disability frameworks is therefore both practical and theoretical. Practically, AI shapes the conditions of disabled people's lives in consequential and often invisible ways. El Morr et al. (2024) document, through a systematic scoping review, that while the majority of AI research related to disability remains medically focused, there is significant and growing engagement with AI in assistive technology, education, and daily living support. Their finding that only a small minority of the reviewed studies addressed disability justice issues underscores the urgency of theoretically integrating disability rights and social model perspectives into AI research and development. Theoretically, AI forces disability frameworks to grapple with new questions: about data, surveillance, bias, autonomy, and the relationship between algorithmic systems and social structures of exclusion.

AI-Powered Data Collection and Analysis

One of the most significant capacities of AI in the disability context is its ability to process and analyze large, complex datasets in ways that can reveal patterns invisible to conventional research methods. This capacity has particular significance for disability policy, where data gaps have historically been a major obstacle to evidence-based advocacy and service planning. Disability is frequently undercounted and miscategorized in administrative data systems, and the intersectional dimensions of disability experience are rarely captured in standard datasets. AI-driven data analysis offers the possibility of identifying previously unrecognized patterns of exclusion, disaggregating disability data by race, gender, and other intersecting characteristics, and generating more nuanced and actionable evidence for policy.

However, the deployment of AI for data collection and analysis in disability contexts is also fraught with risk. Algorithmic systems trained on historically biased data will tend to reproduce and amplify existing patterns of discrimination. Newman-Griffis et al. (2023) demonstrate that the disability model implicit in AI system design—whether medical, social, or relational—shapes not only what data is collected but how it is interpreted and what decisions it is used to inform. An AI system designed to identify individuals with disabilities for service targeting, for example, may operationalize disability in ways that exclude people whose impairments are invisible, non-standard, or context dependent. These risks underscore the imperative of explicit theoretical engagement with disability models in AI system design and governance.

Assistive Technology and AI-Enhanced Communication

AI-powered assistive technologies represent one of the most beneficial applications of AI in the disability context. Smith et al. (2023) document the scope of this domain, noting the proliferation of AI-driven tools for speech recognition, environmental navigation, cognitive support, and adaptive communication. For people with motor impairments, AI-driven interfaces that respond to eye movement, facial expression, or neural signals offer possibilities for communication and environmental control that were not available in previous generations of assistive technology. For people with sensory impairments, AI-powered computer vision and natural language processing enable real-time environmental description and sign language interpretation. For people with cognitive disabilities, AI-driven scheduling, reminder, and decision-support tools can scaffold independent living in ways that respect autonomy.

Importantly, the most significant advances in this domain are characterised by adaptivity—the capacity of AI systems to learn from individual users and customize their responses to individual patterns of use, communication, and need. This adaptivity is theoretically significant because it represents a departure from the standardization that has characterised most assistive technology design, moving toward a model of personalised, responsive

support that can accommodate the heterogeneity of disability experience. Fernandez-Batanero et al. (2022) document the breadth of AI applications in inclusive education, demonstrating how adaptive learning platforms can respond to individual learning profiles and provide differentiated support to students with a wide range of disabilities. Zdravkova et al. (2022) extend this analysis to communication and learning technologies for disabled children, demonstrating the potential of AI to reshape educational access.

IV. PROPOSED INNOVATIVE THEORETICAL MODELS

The following four models are proposed as theoretically grounded frameworks for integrating AI into inclusive disability praxis. Each model addresses one or more of the gaps identified in the literature review, and each positions AI not merely as a tool but as a structural element of an inclusive theoretical architecture. These models are intended to be complementary rather than competing; different contexts of practice and policy may call for different emphases, and the models may productively be used in combination.

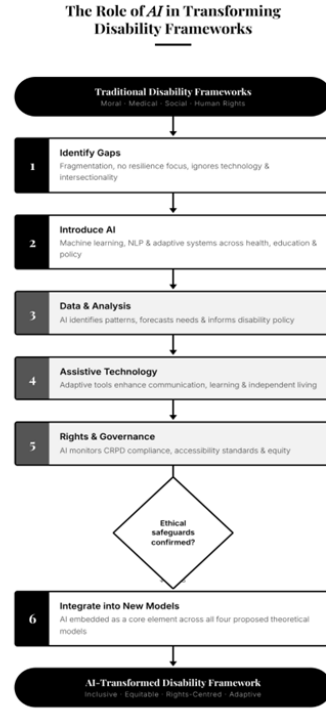


Figure 3. A concise flowchart depicting how AI transforms traditional disability frameworks — from gap identification through data analytics, assistive technology, rights governance, and ethical integration into new inclusive models. Adapted from From Practitioner to Professional: Harnessing AI for Inclusive Disability Models.

Model 1: Holistic Inclusion Model 2.0

Holistic Inclusion Model 2.0 builds upon the biopsychosocial tradition, which recognises that disability is produced through the interaction of biological, psychological, and social factors, and extends it by incorporating AI-enabled analysis of environmental and structural dimensions. The model draws on the World Health Organization's International Classification of Functioning, Disability and Health (ICF), which maps disability across body functions, activities, participation, and contextual factors, and enriches this framework by deploying AI to enable dynamic, real-time analysis of the interaction between individual functioning and environmental conditions.

The core theoretical innovation of this model is the integration of adaptive feedback mechanisms powered by machine learning. Rather than treating the relationship between individual and environment as a static diagnostic assessment, the Holistic Inclusion Model 2.0 conceptualises it as a dynamic, evolving interaction that can be continuously monitored, analysed, and used to inform personalised interventions. AI systems that track the accessibility

of built environments, the adequacy of communication supports, or the appropriateness of educational accommodations can generate ongoing data that enables professionals, policymakers, and disabled individuals themselves to identify and address barriers in real time.

This model also addresses the intersectionality gap by integrating demographic and identity data into its analytical framework—enabling, for example, the identification of patterns in which disabled women of colour face systematically different barriers than white disabled men in the same physical environment. The ethical imperatives associated with such data collection—privacy, consent, community ownership—are addressed in Section 5 below.

Model 2: Resilience and Potential Model with AI Insights

The Resilience and Potential Model with AI Insights draws on strength-based and positive psychology approaches within disability studies and rehabilitation science to position resilience, adaptive capacity, and self-determination as central analytical categories. Unlike frameworks oriented primarily around deficit, exclusion, or barrier identification, this model asks: what capacities, resources, and strategies do disabled individuals and communities bring to bear in navigating and transforming their circumstances, and how can AI be used to identify, amplify, and support these capacities?

The model has two principal components. The first is an analytical dimension: AI-powered tools that can map individual strengths and adaptive strategies across multiple life domains—communication, mobility, social engagement, employment, learning—and identify patterns that can inform personalised support planning. This is distinct from deficit-oriented assessment because it begins with what individuals can do and prefer, and asks how technology and environmental modification can extend and support these capabilities. The second component is a developmental dimension: AI systems that track progress over time and generate adaptive recommendations for skill development, resource access, and self-advocacy.

This model is explicitly oriented toward self-determination and empowerment. AI tools in this framework are designed not to substitute for disabled individuals' own agency but to inform and support it—providing data and options that enable people to make more fully informed choices about their own lives. This orientation reflects the disability rights principle of nothing about us without us and requires that AI systems in this model be co-designed with disabled communities, with transparency about data use and clear mechanisms for individual control.

Model 3: Ecosystem Model Enhanced by AI

The Ecosystem Model Enhanced by AI situates disability within the Bronfenbrenner-derived multilevel ecological framework—encompassing the microsystem of immediate relationships and interactions, the mesosystem of institutional connections, the exosystem of broader community and policy environments, and the macrosystem of cultural and ideological frameworks—and uses AI to enable analysis and intervention across these multiple levels simultaneously.

The theoretical innovation of this model lies in its use of AI to create shared information platforms that connect stakeholders across levels of the ecosystem. At the microsystem level, AI can support individualized care coordination and family communication. At the mesosystem level, AI-powered platforms can facilitate information-sharing between schools, healthcare providers, social services, and employers. At the exosystem level, AI-driven policy analytics can identify systemic patterns in service access, outcome disparities, and resource allocation. At the macrosystem level, AI can support the monitoring and evaluation of accessibility standards and rights compliance across large institutional systems.

This model responds directly to the fragmentation problem identified by Burchardt (2004) by creating analytical infrastructure for understanding how individual disability experiences are produced and reproduced across multiple ecological levels. It also addresses the intersectionality gap by enabling the disaggregation of system-level data by race, gender, and other relevant dimensions, revealing patterns of

intersecting disadvantage that would be invisible in siloed single-level analyses.

Model 4: Transformative Justice Model through AI Advocacy

The Transformative Justice Model through AI Advocacy situates disability advocacy within the broader tradition of transformative justice—a framework that insists on the interconnection of disability rights with racial justice, gender justice, economic justice, and other struggles for structural equity. This model recognises that disability disproportionately affects marginalised communities, that the intersections between disability and other forms of oppression are structural rather than incidental, and that effective disability advocacy therefore requires coalition-building across social justice movements.

AI contributes to this model primarily at the level of coalition infrastructure and strategic intelligence. Social media analytics powered by AI can identify emerging alliances, track public discourse on disability rights, and support the coordination of cross-movement advocacy campaigns. AI-driven policy analysis can illuminate connections between disability policy and other policy domain welfare reform, criminal justice, housing, education—enabling advocates to make strategic arguments about intersecting impacts. Natural language processing tools can support the production and dissemination of accessible advocacy materials across multiple languages and formats.

The Transformative Justice Model also engages critically with the risks of AI—recognising that algorithmic systems have been used to surveil, categorised, and disadvantage marginalised communities, and that AI advocacy infrastructure must be designed with robust privacy protections, community ownership, and accountability mechanisms. This is not a naive celebration of AI as inherently emancipatory; it is a theoretically informed engagement with AI as a site of political contestation, in which the outcomes depend on the structural choices made in system design and governance.

V. DISCUSSION

Integration of AI in Disability Advocacy and Professional Practice

The four models proposed in this paper collectively articulate a vision of professional disability practice in which AI is not an add-on or a peripheral tool but a structural element of theoretically informed, rights-centred, and community-grounded praxis. This vision requires significant changes in professional education, institutional culture, and policy frameworks. Professionals in disability services, policy, and advocacy must develop the capacity to engage critically and constructively with AI—understanding its theoretical underpinnings, its practical applications, and its risks.

The proposed models also have implications for the design of AI systems. As Newman-Griffis et al. (2023) demonstrate, the disability model embedded in AI system design has consequential effects on what the system does and how it affects disabled people. Designers of AI systems for healthcare, employment, education, and social services must therefore engage explicitly with disability models—not as an afterthought of bias mitigation but as a foundational design question. The four models proposed in this paper offer a theoretical vocabulary for this engagement, providing designers with resources for asking: what model of disability does this system instantiate, and what are the implications of that choice for the people it will affect?

Ethical Challenges and Critical Considerations

The integration of AI into disability frameworks raises a range of serious ethical challenges that must be addressed with theoretical rigour and practical commitment. The first is the risk of algorithmic bias. AI systems trained on historical data inherit the biases of the systems that generated that data—systems that have historically excluded, misclassified, and disadvantaged disabled people, particularly those from marginalised racial and gender groups. Bias mitigation is not a purely technical problem; it requires the kind of critical, intersectional, participatory engagement with disability experience that only communities can provide.

The second challenge concerns data privacy and surveillance. The deployment of AI in disability contexts necessarily involves the collection and analysis of sensitive personal data about health, functioning, communication, and behaviour. The risks of misuse—by employers, insurers, state agencies, or other actors—are significant, particularly for communities already subject to disproportionate surveillance and institutional control. Robust privacy frameworks, community data governance models, and individual consent mechanisms are ethical prerequisites for the AI-enhanced disability frameworks proposed in this paper.

The third challenge concerns digital accessibility and equity. AI-powered tools are only meaningful if disabled people can access and use them, and the digital divide—shaped by socio-economic inequality, geographic isolation, and the inaccessibility of many digital platforms—means that the benefits of AI are likely to be unevenly distributed. Equity requires not only that AI tools themselves be accessible but that the infrastructure, literacy, and support necessary to use them be equitably distributed.

The fourth challenge is participation and co-design. The disability rights principle of nothing about us without us applies to AI design as much as to any other domain. The most technically sophisticated AI systems will reproduce ableist assumptions if they are designed without the meaningful participation of disabled people. Co-design—in which disabled communities are partners in the conceptualization, design, testing, and governance of AI systems—is not merely an ethical aspiration but a quality requirement: systems designed with community input are more likely to be useful, appropriate, and effective.

VI. FUTURE RESEARCH DIRECTIONS

The theoretical models proposed in this paper require empirical development and testing through participatory research methodologies. Several priority directions can be identified. First, participatory action research projects that engage disabled communities in the co-design and evaluation of AI-enhanced disability practice tools would generate both practical knowledge and theoretical refinement. Second,

comparative policy analyses examining how different AI governance frameworks—in different national and regional contexts—affect the rights and experiences of disabled people would illuminate the structural conditions under which AI can advance or undermine disability justice. Third, longitudinal studies tracking the impacts of AI-enhanced disability services on individual outcomes, community wellbeing, and rights realisation would provide the empirical grounding that theoretical models require.

Methodologically, this research agenda calls for approaches that centre disability experience, honour community knowledge, and maintain critical vigilance about the uses to which research findings are put. Disability studies traditions of participatory, emancipatory, and community-based research provide important resources for this work, as do the intellectual frameworks of critical AI ethics and data justice scholarship.

CONCLUSION

This paper argued that the transition from practitioner to professional in the disability field requires theoretical frameworks adequate to the present moment—frameworks that can engage with artificial intelligence as a structural feature of the social, institutional, and technological landscape in which disability is experienced and responded to. The four models proposed here—the Holistic Inclusion Model 2.0, the Resilience and Potential Model with AI Insights, the Ecosystem Model Enhanced by AI, and the Transformative Justice Model through AI Advocacy—are offered as contributions to this theoretical work.

Each model addresses specific gaps in the existing literature: the fragmentation between impairment and societal exclusion, the neglect of strength-based perspectives, the insufficient engagement with intersectionality, and the failure to theorize AI as a site of political contestation and transformative possibility. Together, they constitute a framework for professional practice that is theoretically grounded, rights-centred, community-oriented, and technologically informed.

The ethical challenges associated with AI—bias, surveillance, inequity, and the exclusion of disabled communities from design processes—are not reasons to avoid engagement with AI in disability frameworks. They are reasons to engage more rigorously, more critically, and more collaboratively. The models proposed in this paper are designed to support that engagement, providing theoretical resources for professionals, policymakers, researchers, and advocates who are committed to building a world in which AI works in the service of disability justice rather than against it.

The professional who takes seriously the ambition of this paper is one who can move between the particularities of individual support and the generalities of systemic change, who can engage with technology critically and constructively, who can build coalitions across social justice movements, and who maintains, through all of this, an unwavering orientation toward the dignity, agency, and rights of disabled people. AI, properly theorised and appropriately deployed, can be a powerful ally in that work.

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