Policy

Introduction

Autonomous and intelligent systems (A/IS) are a part of our society. The use of these powerful technologies promotes a range of social benefits. They may spur development across economies and society through numerous applications, including in commerce, finance, employment, health care, agriculture, education, transportation, politics, privacy, public safety, national security, civil liberties, and human rights. To encourage the development of socially beneficial applications of A/IS, and to protect the public from adverse consequences of A/IS, intended or otherwise, effective policies and government regulations are needed.

Effective A/IS policies serve the public interest in several important respects. A/IS policies and regulations, at both the national level and as developed by professional organizations and governing institutions, protect and promote safety, privacy, human rights, and cybersecurity, as well as enhance the public's understanding of the potential impacts of A/IS on society. Without policies designed with these considerations in mind, there may be critical technology failures, loss of life, and high-profile social controversies. Such events could engender policies that unnecessarily hinder innovation, or regulations that do not effectively advance public interest and protect human rights.

We believe that effective A/IS policies should embody a rights-based approach[1] that addresses five issues:

1. **Ensure that A/IS support, promote, and enable internationally recognized legal norms.**
   Establish policies for A/IS using the internationally recognized legal framework for human rights standards that is directed at accounting for the impact of technology on individuals.

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2. Develop government expertise in A/IS.
Facilitate skill development, technical and otherwise, to further boost the ability of policy makers, regulators, and elected officials to make informed proposals and decisions about the various facets of these new technologies.

3. Ensure governance and ethics are core components in A/IS research, development, acquisition, and use.
Require support for A/IS research and development (R&D) efforts with a focus on the ethical impact of A/IS. To benefit from these new technologies while also ensuring they meet societal needs and values, governments should be actively involved in supporting relevant R&D efforts.

4. Create policies for A/IS to ensure public safety and responsible A/IS design.
Governments must ensure consistent and locally adaptable policies and regulations for A/IS. Effective regulation should address transparency, explainability, predictability, bias, and accountability for A/IS algorithms, as well as risk management, privacy, data protection measures, safety, and security considerations. Certification of systems involving A/IS is a key technical, societal, and industrial issue.

5. Educate the public on the ethical and societal impacts of A/IS.
Industry, academia, the media, and governments must establish strategies for informing and engaging the public on benefits and challenges posed by A/IS. Communicating accurately both the positive potential of A/IS and the areas that require caution and further development is critical to effective decision-making environments.

As A/IS comprise a greater part of our daily lives, managing the associated risks and rewards becomes increasingly important. Technology leaders and policy makers have much to contribute to the debate on how to build trust, promote safety and reliability, and integrate ethical and legal considerations into the design of A/IS technologies. This chapter provides a principled foundation for these discussions.

Policy

Issue 1: Ensure that A/IS support, promote, and enable internationally recognized legal norms

Background

A/IS technologies have the potential to impact internationally recognized economic, social, cultural, and political rights through unintended outcomes and outright design decisions. Important examples of this issue have occurred with certain unmanned aircraft systems (Bowcott 2013), use of A/IS in predictive policing (Shapiro 2017), banking (Garcia 2017), judicial sentencing (Osoba and Welser 2017), and job hunting and hiring practices (Datta, Tschantz, and Datta 2014). Even service delivery of goods (Ingold and Soper 2016) can impact human rights by automating discrimination (Eubanks 2018) and inhibiting the right of assembly, freedom of expression, and access to information. To ensure A/IS are used as a force for social benefit, nations must develop policies that safeguard human rights.

A/IS regulation, development, and deployment should, therefore, be based on international human rights standards and standards of international humanitarian laws. When put into practice, both states and private actors will consider their responsibilities to protect and respect internationally recognized political, social, economic, and cultural rights. Similarly, business actors will consider their obligations to respect international human rights, as described in the United Nations Guiding Principles on Business and Human Rights (OHCHR 2011), also known as the Ruggie principles.

The Ruggie principles have been widely referenced and endorsed by corporations and have led to the adoption of several corporate social responsibility (CSR) policies in various companies. With broadened support, the Ruggie principles will strengthen the role of businesses in protecting and promoting human rights and ensuring that the most crucial human values and legal standards of human rights are respected by A/IS technologists.

Recommendations

National policies and business regulations for A/IS should be founded on a rights-based approach. The Ruggie principles provide the internationally recognized legal framework for human rights standards that accounts for the impact of technology on individuals while also addressing inequalities, discriminatory practices, and the unjust distribution of resources.

These six considerations for a rights-based approach to A/IS flow from the recommendation above:

- *Responsibility:* Identify the right holders and the duty bearers and ensure that duty bearers have an obligation to fulfill all human rights.

- *Accountability:* Oblige states, as duty bearers, to behave responsibly, to seek to represent the greater public interest, and to be open to public scrutiny of their A/IS policies.

- *Participation:* Encourage and support a high degree of participation of duty bearers, right holders, and other interested parties.

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- *Nondiscrimination:* Underlie the practice of A/IS with principles of nondiscrimination, equality, and inclusiveness. Particular attention must be given to vulnerable groups, to be determined locally, such as minorities, indigenous peoples, or persons with disabilities.

- *Empowerment:* Empower right holders to claim and exercise their rights.

- *Corporate responsibility:* Ensure that companies' developments of A/IS comply with the rights-based approach. Companies must not willingly provide A/IS to actors that will use them in ways that lead to human rights violations.

Further Resources

- Human rights-based approaches have been applied to development, education and reproductive health. See the UN Practitioners' Portal on Human Rights Based Programming.

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Issue 2: Develop government expertise in A/IS

Background

There is a consensus among private sector and academic stakeholders that effectively governing A/IS and related technologies requires a level of technical expertise that governments currently do not possess. Effective governance requires experts who understand and can analyze the interactions between A/IS technologies, policy objectives, and overall societal values. Sufficient depth and breadth of technical expertise will help ensure policies and regulations successfully support innovation, adhere to national principles, and protect public safety.

Effective governance also requires an A/IS workforce that has adequate training in ethics and access to other resources on human rights standards and obligations, along with guidance on how to apply them in practice.

Recommendations

Policy makers should support the development of expertise required to create a public policy, legal, and regulatory environment that allows innovation to flourish while protecting the public and gaining public trust.[2] Example strategies include the following:

- Expertise can be furthered through technical fellowships, or rotation schemes, where technologists spend an extended time in political offices, or policy makers work with organizations[3] that operate at the intersection of technology policy, technical engineering, and advocacy. This will enhance the technical knowledge of policy makers, strengthen ties between political and technical communities, and contribute to the formulation of effective A/IS policy.

- Expertise can also be developed through cross-border sharing of best practices around A/IS legislation, consumer protection, workforce transformation, and economic displacement stemming from A/IS-based automation. This can be done through governmental cooperation, knowledge exchanges, and by building A/IS components into venues and efforts surrounding existing regulation, e.g., the General Data Protection Regulation (GDPR).

- Because A/IS involve rapidly evolving technologies, both workforce training in A/IS areas and long-term science, technology, engineering, and math (STEM) educational strategies, along with ethics courses, are needed beginning in primary school and extending into university or vocational courses. These strategies will foster A/IS expertise in the next generation of many groups, e.g., supervisors of critical systems, scientists, and policy makers.

Policy

Further Resources

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Issue 3: Ensure governance and ethics are core components in A/IS research, development, acquisition, and use.

Background

Greater national investment in ethical A/IS research and development would stimulate the economy, create high-value jobs, improve governmental services to society, and encourage international innovation and collaboration (U.S. OSTP report on the Future of AI 2016). A/IS have the potential to improve our societies through technologies such as intelligent robots and self-driving cars that will revolutionize automobile transportation and logistics systems and reduce traffic fatalities. A/IS can improve quality of life through smart cities and decision support in health care, social services, criminal justice, and the environment. To ensure such a positive effect on individuals, societies, and businesses, nations must increase A/IS R&D investments, with particular focus on the ethical development and deployment of A/IS.

International collaboration involving governments, private industry, and non-governmental organizations (NGOs) would promote the development of standards, data sharing, and norms that guide ethically aligned A/IS R&D.

Recommendations

Develop national and international standards for A/IS to enable efficient and effective public and private sector investments. Important aspects for international standards include measures of societal benefits derived from A/IS, the use of ethical considerations in A/IS investments, and risks increased or decreased by A/IS. Nations should consider their own ethical principles and develop a framework for ethics that each country could use to reflect local systems of values and laws. This will encourage actors to think both locally and globally regarding ethics. Therefore, we recommend governments to:

- Establish priorities for funding A/IS research that identify approaches and challenges for A/IS governance. This research will identify models for national and global A/IS governance and assess their benefits and adequacy to address A/IS societal needs.

Policy

- Encourage the participation of a diverse set of stakeholders in the standards development process. Standards should address A/IS issues such as fairness, security, transparency, understandability, privacy, and societal impacts of A/IS. A global framework for identification and sharing of these and other issues should be developed. Standards should incorporate independent mechanisms to properly vet, certify, audit, and assign accountability for the A/IS applications.

- Encourage and establish national and international research groups that provide incentives for A/IS research that is publicly beneficial but may not be commercially viable.

Further Resources

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Issue 4: Create policies for A/IS to ensure public safety and responsible A/IS design

Background

Effective governance encourages innovation and cooperation, helps synchronize policies globally, and reduces barriers to trade. Governments must ensure consistent and appropriate policies and regulations for A/IS that address transparency, explainability, predictability, and accountability of A/IS algorithms, risk management,[4] data protection, safety, and certification of A/IS.

Appropriate regulatory responses are context-dependent and should be developed through an approach that is based on human rights[5] and has human well-being as a key goal.

Policy

Recommendations

Nations should develop and harmonize their policies and regulations for A/IS using a process that is based on informed input from a range of expert stakeholders, including academia, industry, NGOs, and government officials, that addresses questions related to the governance and safe deployment of A/IS. We recommend:

- Policy makers should consider similar work from around the world. Due to the transnational nature of A/IS, globally synchronized policies can benefit public safety, technological innovation, and access to A/IS.

- Policies should foster the development of economies able to absorb A/IS. Additional focus is needed to address the effect of A/IS on employment and income and how to ameliorate certain societal conditions. New models of public-private partnerships should be studied.

- Policies for A/IS should remain founded on a rights-based approach.

- Policy makers should be prepared to address issues that will arise when innovative and new practices enabled by A/IS are not consistent with current law. In A/IS, where there is often a different system developer, integrator, user, and ultimate customer, application of traditional legal concepts of agency, strict liability, and parental liability will require legal research and deliberation. Challenges from A/IS that must be considered include increasing complexity of and interactions between systems, and the potential for reduced predictability due to the nature of machine learning systems.

Further Resources

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Issue 5: Educate the public on the ethical and societal impacts of A/IS

Background

It is imperative for industry, academia, and government to communicate accurately to the public both the positive and negative potential of A/IS and the areas that require caution.[6] Strategies for informing and engaging the public on A/IS benefits and challenges are critical to creating an environment conducive to effective decision-making.

Educating users of A/IS will help influence the nature of A/IS development. Educating policy makers and regulators on the technical and legal aspects of A/IS will help enable the creation of well-defined policies that promote human rights, safety, and economic benefits. Educating corporations, researchers, and developers of A/IS on the benefits and risks to individuals and societies will enhance the creation of A/IS that better serve human well-being.[7]

Another key requirement is that A/IS are sufficiently transparent regarding implicit and explicit values and algorithmic processes. This is necessary for the public understanding of A/IS accountability, predictions, decisions, biases, and mistakes.

Recommendations

Establish an international multi-stakeholder forum, to include commercial, governmental, and other civil society groups, to determine the best practices for using and developing A/IS. Codify the deliberations into international norms and standards. Many industries—in particular, system industries (automotive, air and space, defense, energy, medical systems, manufacturing)—will be changed by the growing use of A/IS. Therefore, we recommend governments to:

- Increase funding for interdisciplinary research and communication on topics ranging from basic research on intelligence to principles of ethics, safety, privacy, fairness, liability, and trustworthiness of A/IS. Societal aspects should be addressed both at an academic level and through the engagement of business, civil society, public authorities, and policy makers.

- Empower and enable independent journalists and media outlets to report on A/IS by providing access to technical expertise.

- Conduct educational outreach to inform the public on A/IS research, development, applications, risks and rewards, along with the policies, regulations, and testing that are designed to safeguard human rights and public safety.

Policy

Develop a broad range of A/IS educational programs. Undergraduate, professional degree, advanced degree, and executive education programs should offer instruction that ensures lawyers, legislators, and A/IS workers are well informed about issues arising from A/IS, including the need for measurable standards of A/IS performance, effects, and ethics, and the need to mature the still nascent capabilities to measure these elements of A/IS.

Further Resources

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Endnotes

1   This approach is rooted in internationally recognized economic, social, cultural, and political rights.

2   This recommendation concurs with the multiple recommendations of the United States National Science and Technology Council, One Hundred Year Study of Artificial Intelligence, Japan's Cabinet Office Council, European Parliament's Committee on Legal Affairs, and others.

3   For example, American Civil Liberties Union, Article 19, the Center for Democracy & Technology, Canada.AI, or Privacy International. United Nations committees may also be useful in fostering knowledge exchanges.

4   This includes consideration regarding application of the precautionary principle, as used in environmental and health policy-making, where the possibility of widespread harm is high and extensive scientific knowledge or understanding on the matter is lacking.

5   Human rights–based approaches have been applied to development, education, and reproductive health. See the UN Practitioners' Portal on Human Rights Based Programming.

6   "(AI100)," Stanford University., August 2016.

7   Private sector initiatives are already emerging, such as the Partnership on AI; the AI for Good Foundation; and the Ethics and Governance of Artificial Intelligence Initiative, launched by Harvard's Berkman Klein Center for Internet & Society and the MIT Media Lab.