

Artificial Intelligence and Data Science for Social Good: The Case for the SDGs

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Abstract—Technologies have always been reshaping our economic, social and cultural environments but more recently we have seen the speed of change and impact of ICT technologies in particular rapidly increasing. These phenomenal changes are fuelled by the proliferation of data and the advances in computational methods. Though Artificial Intelligence as a (sub)discipline has been around for over 60 years, it is only in the last decade or so that we have seen very significant improvements in techniques such as machine learning. The potential of Artificial Intelligence to transform multiple aspects of our lives is huge, but there is an equally huge challenge in ensuring that the benefits of these technologies reach all.

I. INTRODUCTION

Technologies have always been reshaping our economic, social and cultural environments but more recently we have seen the speed of change and impact rapidly increasing. These phenomenal changes are fuelled by the proliferation of data and the advances in computational technologies.

Indeed technology in more general, and Artificial Intelligence (AI) more specifically should be used to enhance human life, but this should be to the benefit of all humanity rather than be restricted to the developed world or the few that can afford such technologies.

This short position paper is aimed at stimulating discussion and raising awareness of the potential uses of artificial intelligence and data science techniques for social good and in support of the UN's Sustainable Development Goals in particular.

II. ARTIFICIAL INTELLIGENCE AND THE SUSTAINABLE DEVELOPMENT GOALS

Artificial Intelligence as a (sub)discipline has been around for over 60 years, and yet it is only in the last decade or so that we have seen impressive improvements in some techniques such as machine learning and their accuracy in tasks such as prediction. Neural networks are not new, they have been around for a long time, but the “machinery” to make them work – the huge datasets to train them and the required computational power – have only been within reach in recent years. This has subsequently led to an unprecedented revival and interest in the field. Indeed, AI is now a term that is commonly used, by politicians, policy makers and industry at

large but also the public, although one could argue that there are grave misconceptions and misuses of the term.

Indeed, looking across the world, almost everyone is attempting to do AI. Governments across the world have been creating Ministries for AI, AI Councils and have been publishing AI strategies on how they envisage AI to be supporting economic growth, but also transform the public sector and business in general. AI has also supported global efforts to combat the COVID pandemic [1] while it has been heralded and envisaged as the technology that will permeate almost every aspect of our daily lives in the not so distant future.

The world has committed to ensuring peace and prosperity for all through a shared agenda and set of goals: the Sustainable Development Goals (SDGs)¹ to be delivered by 2030. The SDGs span all aspects of human life and range from advocating the end of poverty to ensuring gender equality and providing clean water for all. Seventeen goals are underpinned by 169 targets, Figure 1.

The advances that we have seen in AI (or specific sub-areas of AI) in the last few years present us with a unique opportunity to speed up progress and support the implementation of the SDGs across the world. In the 2014 report “A World That Counts: Mobilising the Data Revolution for Sustainable Development” submitted by the United Nations Secretary-General’s Independent Expert Advisory Group (IEAG) to the then Secretary-General Ban Ki-moon, the critical role of data and analytics for sustainable development were highlighted [2]. The report emphasises the need to develop skills and research capacity in all countries, but in developing and transitioning countries in particular, improving not only access to data and information but also data literacy, bridging the gap between knowledge-rich and knowledge-poor so that people at different levels can understand and work with data, monitor progress on goals and hold governments, institutions and organisations to account. AI can help us to continuously collect data about different aspects of the world and the SDG targets and measure and verify progress on their implementation. Importantly, AI can directly support the implementation of the SDGs, by for instance supporting the delivery of targeted health services

¹<https://sdgs.un.org/goals>

SUSTAINABLE DEVELOPMENT GOALS



Fig. 1. The Sustainable Development Goals (SDGs); source: <https://sdgs.un.org/goals>

where they are needed the most and contributing therefore to improving health and wellbeing (SDG 3: Good Health and Wellbeing).

AI and Data Science (DS) are also key technologies in transforming developing and transitioning countries economies to become digital and knowledge economies. By developing AI and DS skills in country and equipping people in developing and transitioning countries with advanced data analytics skills can help transform organisations/businesses, create technopreneurs who can innovate and develop new businesses which can lead to further job creation and supporting economic growth and closing the gap between knowledge-rich and knowledge-poor countries.

III. CHALLENGES AND THE ROAD AHEAD

Notable successes in the application of AI techniques – driverless cars for instance – have inadvertently created huge expectations on what the technology can deliver, while at the same time there exist misconceptions and misunderstandings about AI. The current level of hype around AI is damaging and may have long term and detrimental to the field consequences – unless we help dispel confusion and manage expectations on the uses and abuses of AI, we are risking plunging into another AI winter if we are unable to deliver the envisaged huge benefits.

Beyond this, AI currently presents a range of other challenges: from the continuous development of techniques to tackle problems in different domains and their application in the real world, to the ethical, legal, societal and cultural dimensions of the deployment of AI and also impact at the individual level including human rights. In particular in the public sector and government levels, politicians and policy makers can at times appear to operate at the two extremes: either they view AI as the solution to all problems; or they are deeply sceptical and apprehensive about “letting lose” an AI system that can make decisions on individuals that could have dire consequences.

Furthermore, while technology is rapidly advancing in the developing countries, the same cannot be said for developing and transitioning countries and the gap between knowledge-rich and knowledge-poor countries is exacerbating. The promise of AI in relation to the SDGs can only be delivered by a concerted effort and a holistic approach that transcends geographical, but also disciplinary boundaries. We are at a critical turning point in AI both in its development and its deployment: although countries in the Global North are accelerating efforts to develop and benefit from the power of AI, the Global South lags behind and the gap will not close until we have a coordinated effort to build skills, knowledge and capacity in AI in country. We need to see the transfer of technological capability, knowledge and expertise from the

technologically intensive nations to the Global South and more widely across the world. Instead of a piecemeal approach, where each country with its research and academic community, businesses and the public sector develop individual pieces of work to address developmental challenges, we are advocating for a collaborative approach across countries and research communities, inclusive and multi-stakeholder. Instead of a top-down approach where funders and governments guide the funding portfolio, we are advocating for a more mixed approach where country priorities, as seen from the top, are combined with the challenges and issues as faced on the ground to create a portfolio of impactful projects whose outputs can be shared and further tailor-made to be used by different nations.

The voices of multiple stakeholders need to be part of the conversation and they are integral in shaping the future of AI and DS for the benefit of all. We need to develop AI further and take systems out of labs and deploy them in the real world - in safe, responsible and ethical ways - so that we can evaluate AI and its tangible and hopefully positive impact on society and individuals.

What's needed is a cross-country and cross disciplinary effort in AI with the emphasis on the implementation of the SDGs that will be able to deliver outcomes and benefits that existing networks and individual stakeholders perhaps are not able to deliver at scale and at pace. Involving policy makers and politicians in this effort is of paramount importance: equipping them with the understanding of how AI and DS can be used to improve lives and the human condition can help embed AI and DS in key areas of need across the world while also opening up decision making in ways that can build public trust, fairness and accountability.

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