ABSTRACT

In the future of India lies the future of a sixth of the world's population. As the Artificial Intelligence (AI) revolution sweeps through societies and enters daily life, its role in shaping India's development and growth is bound to be substantial. For India, AI holds promise as a catalyst to accelerate progress, while providing mechanisms to leapfrog traditional hurdles such as poor infrastructure and bureaucracy. At the same time, an investment in AI is accompanied by risk factors with long-term implications on society: it is imperative that risks be vetted at this early stage. In this paper, we describe opportunities and challenges for AI in India. We detail opportunities that are cross-cutting (bridging India's linguistic divisions, mining public data), and also specific to one particular sector (healthcare). We list challenges that originate from existing social conditions (such as equations of caste and gender). Thereafter we distill out concrete steps and safeguards, which we believe are necessary for robust and inclusive development as India enters the AI era.

1 INTRODUCTION

Investigations into the effect of technology on society are often structured "vertically" around topics such as ethics [15], law [12], economic productivity and employment [11], and the implications of social markers such as gender [59] and race [16]. In this paper, we adopt a "horizontal" framing that views the totality of such questions from a fixed perspective: the role of Artificial Intelligence (AI) in the ongoing development of India. Our choice of a countryspecific perspective is not new. For example, Little (1999) examines the effects of the global production system on several East Asian countries; the recently undertaken AI100 study [57] considers a variety of domains at the intersection of AI and a "typical North American city". A paucity of academic literature on the implications of AI for India motivates a unified treatment of relevant technical and non-technical questions. Our paper aims to provide a framework to which technologists, social scientists, and policy makers can all contribute.

In India's future lies the future of a sixth of theworld's population— enough reason by itself to track the country's tryst with AI. Of equal interest is India's unique social, cultural, economic, and political

context, which has the potential to magnify both the benefits and the risks of AI. With a large, young workforce [62], a fastgrowing economy [41], and a vibrant, resilient democracy [48], India presents an opportunity for AI applications to have tremendous reach and scale (and helping create abundance). AI-driven interventions can enhance public services: for example, streamlining the public distribution system, and reducing the costs of law enforcement. AI can also enhance private services, such as the use of AI-enabled personalised healthcare, or robots in production lines. On the other hand, India's challenges—varying from income inequality [1, 17] and caste-based discrimination [4] to linguistic diversity [42]—are also magnified by the size and variety of the population. Yet other societal challenges, such as malnutrition [39] and girls' education [43], may best be tackled through means unrelated to AI. Where AI can indeed make meaningful contributions, its solutions will often have to withstand cultural forces shaped by millennia of civilisational history.

Since India is significantly behind many other countries in its technological development, it is natural for technologists and policy makers to look to transplant successful ideas from other contexts into India. A growing body of literature warns of the inefficiency, even danger, of such an approach [9, 37, 50]. The main thesis of this paper is indeed the need to plan "AI for India" from the bottom