
Understanding the Rise of Artificial Intelligence

Introduction

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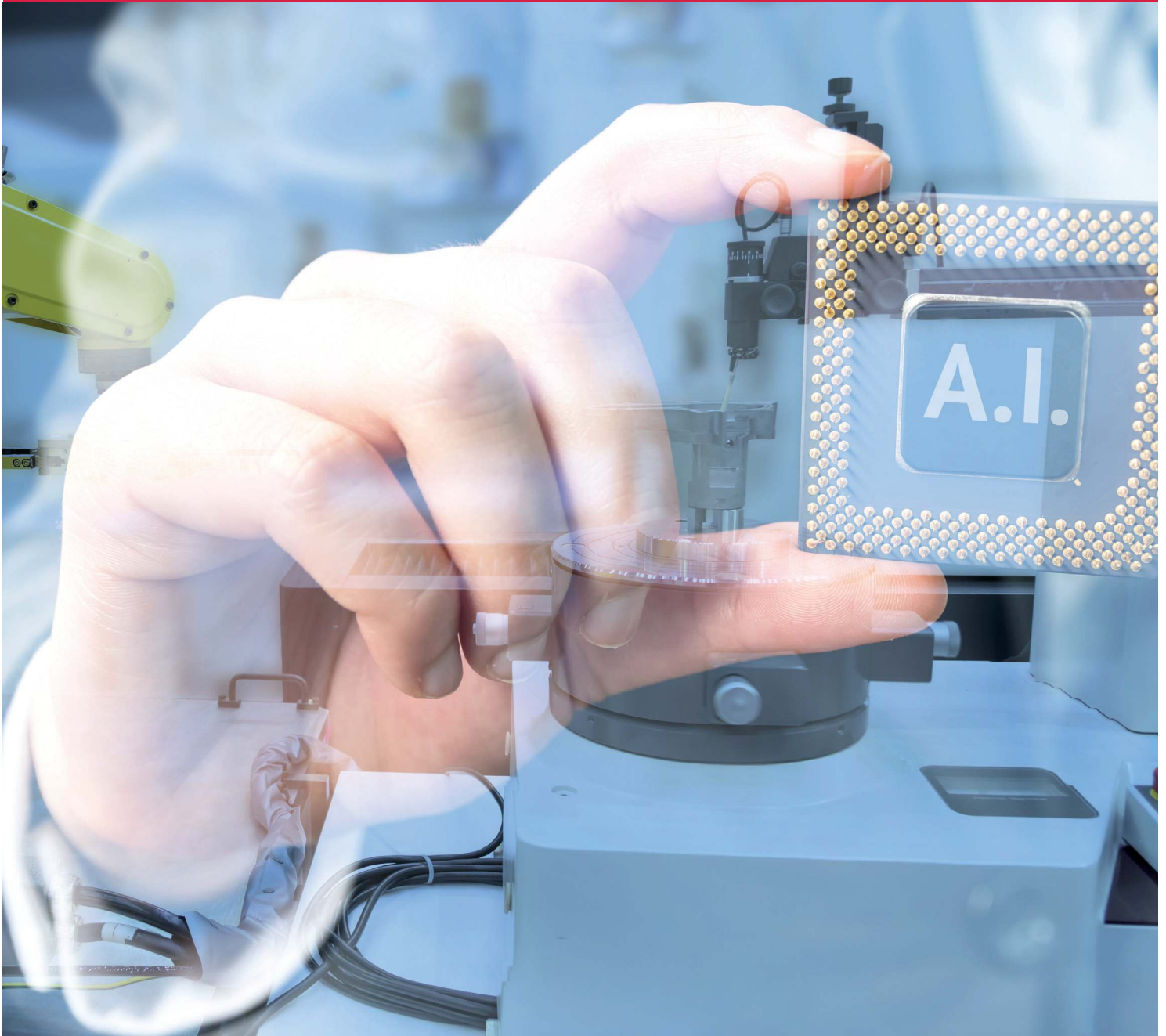
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1. UNDERSTANDING THE RISE OF ARTIFICIAL INTELLIGENCE



Improvements and convergences in machine learning and neurosciences combined with the availability of massive datasets and the ubiquity of high-performance scalable computing are propelling us into a new age of Artificial Intelligence (AI).

The promise these developments hold is immense; so too are the risks and challenges. Most experts qualify the rise of AI as an industrial revolution at par with the three previous industrial revolutions of steam, then oil and electricity, and then computers.

Before exploring the transformative opportunities and challenges associated with the deployment of artificial intelligence systems in urban environments, it is important to define and contextualize this complex notion. It is also important to analyze the dynamics of the rise of AI –velocity and magnitude, the forces shaping it, its political economy and the main actors at the global level. That's the objective of this first Chapter.

We will discover that the AI revolution unfolds as a key catalyzer nested in the broader "digital revolution" which is already transforming cities into "informational infrastructure". That's the argument of Ricardo Alvarez. Indeed at the core of the notion of smart or intelligent cities lies the idea that the *digital* can be harnessed to render urban systems more efficient. While we were up to now talking about "Big Data" to refer to cities' ability to collect, store and process gigantic flows and stocks of data, actors now refer to "Artificial Intelligence" to point to cities' increasing ability to make sense of these troves of data through the use of machine learning algorithms.

That's a crucial shift which opens up avenues to optimize urban systems across functions (planning, delivery, monitoring, maintenance, etc.) and areas (transportation, healthcare, energy, finance, etc.). This shift is political as it raises potentially contentious questions around the respective roles of the private versus the public versus citizens in the design and control of this new "informational infrastructure". AI technologies depend on large amount of high resolution data to feed machine learning algorithms. These data are collected, stored and processed by digital platforms which market exhibit quasi-monopolistic or at least oligopolistic tendencies because of scale effects and network effects associated with the collection and storage of data. Striking the right balance in sharing the value or mobilizing the expertise

and financing associated with the required investment is not easy for municipal administrations. So public-private-people partnership seem inescapable but need to be carefully designed -and probably standardized- to facilitate the relationship between municipal governments and multinationals.

Margarita Boenig-Liptsin then looks at how cities on three different continents imagine themselves in the age of AI and envision the role of AI to solve urban problems and provide better quality of life to their citizens and constituents. She performs a comparative analysis of San Francisco in the United States, Kyoto in Japan, and Lviv in Ukraine. Margo examines these three cases through the lens of "sociotechnical imaginary" defined as a "collectively held, institutionally stabilized, and publicly performed vision of a desirable future, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology".

Finally, as a practical example, Mathieu Saujot, Olivier Sartor and Laura Brimont walk us through the emblematic example of self-driving cars and how they could align mobility systems with the imperative of sustainability. To illustrate that case, Eng Huiling and Benjamin Goh walk us through the case of self-driving cars in Singapore. They analyze the City-State strategy to pioneer the deployment of autonomous vehicles harnessing a very unique cocktail: high urban density, knowledge-based economy, cutting-edge infrastructure, efficient government, a highly educated population and public-private partnerships.

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