Cities and the Digital Revolution

Aligning technology and humanity

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To Peter Newman, Nikos Salingaros, Michael Mehaffy, Gaetan Siew and David Jones who collectively shaped my understanding of cities

Foreword

In his monograph "Cities and the Digital Revolution," Zaheer Allam hits a nice goldilocks zone when considering the future impact of AI on society. On "the porridge is too cold" extreme is Yaval Harari whose book "Homo Deus"[1] and supporting paper "Why Technology Favors Tyranny,"[2] outlines a depressing dystopian future where humanity is controlled by AI. I think Harari's depressing forecasts are generally "silly."[3] On the other hand, "the porridge is too hot" side is John Tamny. His book "The End of Work"[4] wonderfully describes how our future will be made easier by high tech allowing us to pursue income-producing dreams rather than earning money by monetarily rewarded drudgery. I really like Tamny's optimistic book.

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[1]Harari, Yuval Noah. *Homo Deus: A brief history of tomorrow*. Random House, 2016.

[2]Harari, Yuval Noah. Why technology favors tyranny. *The Atlantic* (2018), 64–70.

[3]Robert J. Marks, "BINGECAST: YUVAL HARARI'S SILLY DYSTOPIAN IDEAS," podcast interview with Jay Richards, Mind Matters.AI.

[4]Tamny, John. *The end of work: Why your passion can become your job*. Simon and Schuster, 2018.

Allam's monograph is in the middle and is just right. The scope is focused on the impact of AI on our cities of the future. The coverage is discussed in a well-documented scholarly fashion that does not read like boring scholarly prose. The writing is crisp, to the point, well documented and, most important to those of us with short attention spans, fun to read.

What will the impact of AI be on cities of the future? The topic of Smart Cities using AI is prevalent enough to have its own substantive entry on Wikipedia. But should governments be in the practice of social engineering based on collected data? Gobs of data can be collected from our browsing, GPS sensors and the Internet of things (IoT). This data, it is claimed, can be used to organize and seamlessly run a city. The goals of the use of Big Data like this are noble, but how far are we from accurately mine data for useful information? Gary Smith has written some excellent books outlining concerns of the accuracy of data mining.[5] One fundamental concern is that AI has no common sense. The so-called Winograd Schema common-sense challenge to AI remains unsolved.[6] Spurious correlations in Big Data can miss the mark to the point of being hilarious.[7] Humans in the loop are needed to mitigate such fallacies. Like a toddler running around the living room full of valuable vases, Big Data needs human supervision.

In some areas, Amazon probably knows more about me than my wife. I share my Amazon prime account with my daughter who buys from the site as much as I do. The account is in my name. Amazon, with all its sophisticated Data Mining and AI reputation, isn't smart enough to know a male senior citizen, me, isn't interested in getting emails hawking baby clothes and diapers. I know from conversations that I am not the only one. Data Mining for Smart Cities needs to be smarter than Amazon.[8]

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[5]Smith, Gary. *The AI delusion*. Oxford University Press, 2018. And Smith, Gary, and Jay Cordes. *The 9 pitfalls of data science*. Oxford University Press, 2019.

[6]Robert J. Marks, AI is no match for ambiguity. *Mind Matters*, July 17, 2019.

[7]Spurious Correlations. https://www.tylervigen.com/spurious-correlations.

[8]I suspect the problem could be solved using data clustering. See Meng, Lei, Ah-Hwee Tan, and Donald Wunsch. *Adaptive resonance theory in social media data clustering*. Springer International Publishing, 2019.

Another concern about Smart Cities is the unintended consequences of AI. Self-driving cars being confused by a wind-blown plastic bag is an example. As the complexity of AI increases linearly, the number of unintended consequences increases exponentially. Proposed Smart City managing AI looks complex in conception. This can be mitigated by disjunctive design, i.e. constructing siloed applications instead of one big general AI system.

My biggest concern about Smart Cities is the Big Brother Impact. Smart Cities will supposedly better our lives through the collection of data. "This includes data collected from citizens, devices, and assets ..."[9] I don't want the government to collect data from me. If I'm not violating the law, the government has no business monitoring what I do. In the USA, this right is guaranteed by the fourth amendment to the US constitution. Privacy is a fundamental component of liberty.

A few decades ago, I was an organizer for a professional neural networks conference in the city/state Singapore. What a wonderful clean country it was. Many attributed this to Singapore law. I was told that anyone convicted of murder, rape or dealing drugs got no second chance. They were tried and, if convicted, executed. I saw no graffiti. Recall the 1994 Singapore incident where a 19-year-old American was convicted of vandalism.[10] He was sentenced to four swings with a long whacking cane on his backside.[11] Singapore doesn't mess around with crime. When I visited, leaving a public toilet unflushed carried a fifty dollar fine. And because of its environmental impact, chewing gum was outlawed. Really.

Although I occasionally enjoy chewing gum, I kind of liked Singapore's no-nonsense response to breaking the law. But my mind was changed after asking a National University of Singapore professor how

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[9]Smart Cities, Wikipedia.

[10]Teen-Ager Caned in Singapore Tells of the Blood and the Scars. *Reuters*, June 29, 1994. https://www.nytimes.com/1994/06/27/us/teen-ager-caned-in-singapore-tells-of-the-blood-and-the-scars.html.

[11]The caning incident was soon whimsically treated in the Weird Al Yankovic song "Headline News."

he liked living in Singapore with their uncompromising legal system. Not wishing to be overheard, he whispered.

"Have you ever driven and been followed by a police car?"

I assured him I had.

"Living in Singapore is like this." He said. "Even though you are not doing anything wrong, you clinch the steering wheel with white knuckles nearly paralyzed with fear you might inadvertently do something wrong."

This Big Brother Impact is what is going to happen if some have their way in designing of Smart Cities. Data will be collected from everywhere.

"This includes data collected from citizens, devices, and assets...."[12]

Note "citizens" on this list of data sources. We'll all be living with white knuckles while the government monitors our activities. In some Smart City plans, our privacy will be compromised. Cities will be managed from data collected everywhere.

I don't want the government collecting data from me. First, almost everything the government manages gets screwed up. Witness the frustration felt by visiting the Department of Motor Vehicles or the Social Service Office in the USA. Take a number and wait—typically for a long time. Unaccountable bureaucracies invariably become sluggish and inefficient.

The Governor of Texas, Greg Abbott, recently outlawed the use of cameras at red lights.[13] Bravo! I haven't had an auto accident in over fifty years. My safe driving history gives me a reduced car insurance rate.[14] What right does the government have to use AI to monitor what I do at traffic lights? It only gives innocent me Singaporian white knuckles because Big Brother is watching.

Allam recognizes this in this monograph. Many are concerned about the "potential [of Big Data] to jeopardize the privacy of the citizens due

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[12]Smart Cities, Wikipedia.

[13]Casey Lein. Gov. Abbott Outlaws Red-Light Traffic Cameras in Texas. *US News*, June 3, 2019.

[14]I have gotten a few speeding tickets I deserved.

to its ability to capture minute information and make predictions from such." There is a law of conservations of rights. On the extreme, your law against murder takes away Killer Dave's right to kill someone simply because I am angry with them. Morality rightfully trumps Killer Dave's rights. More on case, the right of the state to collect data from me diminishes my right to privacy. Liberty gained in part from the right of privacy is a fundamental component of human flourishing.

Potential governmental tyranny needs to be avoided in Big Cities. Big Data monitoring citizens can be used to weaponize attacks on political opponents. It's happening today in China.[15] Overt government tyranny occurred in the USA when the IRS delayed and denied tax-exempt status to politically conservative groups.[16]

Use of private businesses is addressed by Allam. The US military successfully uses military contractors like Lockheed, Boeing and Raytheon to keep a free market advantage in procuring equipment. The companies compete in bidding. The system is not perfect, but I can see this as an effective method to push away from a central authority in Smart Cities.

Finally, Allam is a proponent of the use of Big Data in environmental monitoring and control. I'm a big fan of reasonable environmental control. I was raised in Cleveland, Ohio where, 50 years ago, the Cuyahoga River caught on fire.[17] I remember grease balls, the size of large oranges, washing up on Lake Erie shores. My father, a member of the International Union of Operating Engineers Local 18,[18] made a great living helping dredge Lake Erie's polluted sludge bottom. Environmental legislation and monitoring helped restore these pollution extremes, so things are a lot better today.

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[15]See, e.g., Chris Buckley and Paul Mozur, How china uses high-tech surveillance to subdue minorities. *New York Times*, May 22, 2019.

[16]Peter Overby, IRS apologizes for aggressive scrutiny of conservative groups. *NPR*, October 27, 2017.

[17]Mark Urychi, How ohio's cuyahoga river came back to life 50 years after it caught on fire. *NPR*, June 18, 2019.

[18]International Union of Operating Engineers Local 18. http://www.oe18.org/.

Yesterday, there were tornado warnings in my hometown of McGregor, Texas. I turned on my cell phone and there it was without any scrolling or button-pushing: the latest on the tornado warning and the latest update. This example of top-down AI in Smart Cities is great. I don't mind paying taxes to support cyber services like this any more than I do for supporting local police and for building roads. With thought and careful planning, I can see AI enabling Smart Cities to enhance human flourishing without imposing Big Brother oversight. But let's proceed cautiously.

Texas, USA   Robert J. Marks II

Robert J. Marks II is a Distinguished Professor of Engineering in the Department of Electrical & Computer Engineering at Baylor University. Marks is the founding director of the Walter Bradley Center for Natural & Artificial Intelligence, the editor-in-chief of BIO-Complexity and host of Mind Matters.[19] He served as the first President of the IEEE Neural Networks Council, now the IEEE Computational Intelligence Society. He was elected a fellow of the IEEE and of the Optical Society of America. Marks' eponyms include the Zhao-Atlas-Marks time-frequency distribution, the Cheung-Marks theorem in Shannon sampling theory and the Papoulis-Marks-Cheung approach in multidimensional signal analysis. He has consulted for Microsoft Corporation, DARPA and Boeing Computer Services. He authored over 300 peer-reviewed technical publications and contributions to the field of Computational and Artificial Intelligence, and 10 books; his latest being '*Introduction to Evolutionary Informatics*' co-authored with William Dembski and Winston Ewert.

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[19]Marks' Mind Matters podcasts can be listened to at. https://mindmatters.ai/.