Journal of Artificial Intelligence Practice (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/jaip.2024.070109
ISSN 2371-8412 Vol. 7 Num. 1

Futuristic Predictive Artificial Intelligent Model: "Prometheus"

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Keywords: Homelessness; artificial intelligence; Economic policy

Abstract: In the complex tapestry of modern society, homelessness stands out as a pervasive and unavoidable social issue. The unequal distribution of resources, as indicated by a Gini Coefficient greater than zero in any non-utopian world, ensures that homelessness remains challenging in various cities. State governors, mayors, and even district leaders grapple with the task of addressing and, at least, mitigating this problem. However, with the progress of technology, we have discovered a potential solution that utilizes the power of artificial intelligence (AI) to confront and optimize the societal phenomenon of homelessness.

1. Introduction

Our enduring research has helped us identify an AI model that, if wisely employed, could significantly contribute to addressing the challenges associated with homelessness. This futuristic predictive model draws inspiration from Stanford University's creation, "AI Town." This groundbreaking AI study from Stanford University comprises a simulated town populated by 25 AI characters, each crafted with diverse backgrounds and personalities. What makes this program distinct is its ability to replicate human-like interactions among the AI entities, entirely driven by pre-defined parameters. These parameters govern how the virtual inhabitants engage with each other and their environment, creating a dynamic and realistic simulation. When this model was first discovered, we were thrilled to see how the model remains only a difference in perspective with the challenge in reality. Hence, our team thought of a possible method to implicate such mechanics in reality. By harnessing and enhancing this AI model with specialized and controllable parameters, such as adjustments to economic policies (taxation) and their impact on the happiness index of the simulated population, we can project future trends. This innovative approach enables us to develop an AI tool that assists in testing optimal policies, which optimizes solutions to the homelessness issue[1-2].

2. Homelessness: Causes, Consequences, Problems

According to the Department of Housing and Urban Development, around 582,000 people are experiencing homelessness in the United States, meaning 18 per 10,000 people are facing such a problem. These people are particularly vulnerable when facing global challenges like COVID-19, and will be disproportionately affected by policy tradeoffs that try to benefit the majority population. Therefore, despite decades of efforts, homelessness is still an urgent issue to be solved.

The causes of homelessness are multifaceted, embodying historical legacies, policy inefficiencies, and individualized issues. Historical practices like redlining and other discriminatory housing practices and economic activities that led to segregation in cities today would inevitably form homeless communities. Inefficiencies in economic & land-use policies contribute to the situation as well, inadequate social safety nets, limited investment in affordable housing initiatives, and even NIMBYist zoning policies would all lead to an imbalance between the housing and labor markets, which eventually leads to housing unaffordability and ultimately homelessness. Lastly, homelessness may result from factors like job loss, mental health challenges, and domestic and substance abuse, and further intensify the problems, forming a positive feedback loop. These factors are the tradeoffs of governmental policies aiming to solve other problems and the results of human randomness.

The free market cannot eliminate its negative externalities without interventions, while the interdisciplinary nature of homelessness makes it very hard for governments to observe inefficiencies or effect meaningful change even being aware. Especially parameters like human randomness cannot be effectively quantified or qualified, no policies can be created while giving considerable attention to factors like these. Therefore, homelessness seems to be a problem that cannot be eliminated but alleviated. In this global bottleneck of alleviation, AI seems to be a potential catalyst for the next generation of change.

3. The Role of AI

In the research paper, "Generative Agents: Interactive Simulacra of Human Behavior", researchers Joon Sung Park et al. populated a virtual town populated with AI, studying generative agents' ability to mimic human random behavior and how gossip spread. This paper breaks the traditional limitation of AI being mathematic models that do not make mistakes, but the stochasticity of human behaviors is observed.

Through this paper, we envision through improvement and specification, the implementation of such technology to further alleviate homelessness should be on the political agenda. The biggest challenge with tackling homeless-around issues is the complex interplay between different factors and the randomness of citizen reactions after the introduction of new policies, it seems now, that AI can be the remedy.

It is apparent to point out, that the issue's complexity comes from the randomness of human behavior–a person can make irrational decisions based on instinct, emotions, pressures, and other factors that lead to unemployment, mental health issues, and substance abuse, which eventually causes homelessness. The traditional economic market analysis methods, which constitute a large portion of the policy-making process, are highly based on the available dataset, which does not proportionately demonstrate each stakeholder and their interests, neither does it take human randomness into account.

Deviating from traditional data collection methods, we envision using generative agents to simulate human behaviors under different situations. For example, when building another transit line between points A and B, the ripple effect of that project in society will be calculated using generative agents. Despite each time, the result may vary immensely from what would happen, with a theoretically infinite amount of simulations, human randomness can be quantified. Therefore, using generative agents to analyze economic policy can make human randomness a controlled variable. Under this premise, economists can then manipulate independent and dependent variables to better appreciate and address the specific problems that they need to address in their cities surrounding homelessness[3-5].

4. Case Study: Vancouver

Vancouver, with its climate and amenity, attracts immigrants in a large number every year. However, a growing housing unaffordability crisis in the city since the late 20th century officially declares Vancouver's struggle against homelessness. A housing market failure has been on the political agenda for more than 30 years, but no effective changes have been made.

With a population of nearly 700,000 by 2023, Vancouver is mostly zoned to be a city filled with single-detached houses. This can be largely attributed to the strongest voters in Vancouver, who obtain huge amounts of capital accumulation, disproportionately affecting the housing market equilibrium by both changing the elasticity of demand and the implementation of land-use policies. Indeed, the shortage of houses is observed in Vancouver, but the government dares not to take the risk to reorganize the land-use policy but building more high rises in the already overloaded areas of rentals. Making economic decisions requires a multi-faceted consideration, while homelessness and housing market failure are hot topics in Vancouver, when the exact tradeoff is unclear, and may even conflict with the strongest supporters of the local economy, decisions cannot be made.

With generative agents, this issue can be pivoted. Simulating the response of voters under new zoning laws for infinitive times, economists will be able to directly compare the economic results of each action, fostering more efficient decision-making processes. Under the usage of generative agents, households are no longer cold numbers, but real people living in the virtual world. The replication of this process also creates the empirical nature of the system. In Vancouver, city planners can experimentally rezone the entire city following the model of Vienna, and see how that works out. They can foresee how wealthy immigrants perhaps stop migrating to Vancouver because of the decrease in single-detached house stock, or they may see a stronger local community in Vancouver due to the emphasis on economic equity. Generative agents help economists to be fully aware of the externalities of their actions, they can quantify the cost and benefit of each policy, and make a more comprehensive decision balancing the interests of all. When human randomness becomes a controlled variable, the economy is capable of solving a way wider range of subjects, beyond homelessness[6-8].

5. Risk & Sustainability

Despite the benefits of Prometheus, there are still challenges that need to be addressed. Realistically, even as a nonprofit organization, it is important to note that revenue is a significant part of initiation and further development.

To ensure the sustained operation of our program, we have structured Prometheus into three distinct stages, each with a designated primary revenue source. In the initial stage, funding is anticipated to come primarily from NGO sponsorship, with notable examples being organizations such as the Open Society Foundations. Moving into the subsequent stage, the major portion of our income is expected to be generated through subscription fees paid by users who unlock advanced features in our model. Finally, in the last stage, we aim to secure significant support from government funds, contingent upon successfully obtaining endorsement and cooperation from the ruling party. Furthermore, we are planning to do multiple extensions. In pursuit of professional training and development, we hope to cooperate with organizations that require dealing with crisis management, disaster response, and decision-making in high-pressure situations such as metro companies, healthcare institutions, police departments, etc. This phased revenue approach provides a coherent strategy for financial stability throughout Prometheus's evolution.

Another potential challenge involves data disclosure and the credibility of results. To address these issues, Prometheus relies on a robust approach. All processed information stems from a local training model not readily accessible on the Internet, minimizing the risk of data leaks. To solidify the result's

credibility, multiple processing iterations are conducted, with the outcome chosen based on the highest probability, enhancing the accuracy of the generated results. This strategic approach ensures that Prometheus not only overcomes potential challenges but also operates efficiently and reliably in its goal of informing and optimizing policymaking.

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