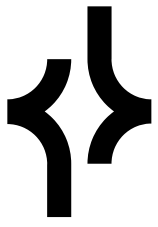Aaru
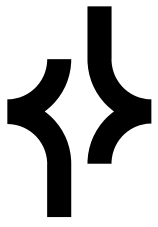
Rethinking the Science of Prediction

Aaru Team
August 2024

Introduction

Recent frameworks have emerged, able to create AI agents dispatchable to make graphs, write code, and search your inbox – all tasks with significant implications for productivity. However, we believe that agents are useful for far more than just everyday tasks. At Aaru, we've quietly explored the predictive capabilities of language-based agents in the simulation space, laying the groundwork for a generalist agent-based predictive system.
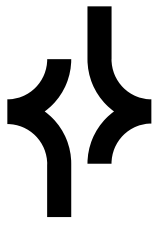
Dynamo is our flagship in political simulation. Dynamo is capable of predicting elections at a national level to modeling opinions on a subcircuit judge's past rulings. By ingesting census data, Dynamo replicates entire geographies for any customizable environment with a myriad of intelligent, demographically accurate agents, allowing for extremely efficient and cost-effective simulations of politics – more accurate than polling.

Lumen is our flagship in the domain of consumer simulation. Lumen is capable of modeling sentiment for A/B testing, marketing material, and more, bringing unparalleled insights to the consumer space. Using demographic data, Lumen recreates any customizable environment, within which it replicates entire target audiences.

Agents respond to questions and prompts by making observations, reasoning through thoughts, and drawing logical conclusions with no human bias. Furthermore, it's fully configurable: users can change the distribution of demographics, properties of the world that the agents exist in, and link simulations together.

This approach is powerful; while no singular agent is capable of accurate predictions, as more agents are used, Aaru converges on reality. We see Dynamo and Lumen as puzzle pieces, as we continue building out whole world simulation. Within two years, we will simulate the entire globe – from the way crops are grown in Ukraine, to how that impacts production of oil in Iraq, trade through the Strait of Malacca, and elections for the Mayor of Baltimore.

The formation date on our company certificate is 28 March 2024. Since then, we've begun to work with multiple Fortune 500 companies, political campaigns, consumer brands, think tanks, and others among the most influential organizations on the planet.
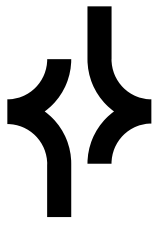
Number
~2000
Respondents

Type
National
Representative

National Elections

We've dedicated a large amount of time towards testing our technology on over 20 years of national elections.

Index **2020 National** Presidential	**Dynamo** Simulation	**Real Results** Final Vote Share	**Polling** RCP Average
Option A **Joe Biden** Kamala Harris	**51.68%** Vote Share	**52.29%** Vote Share	**53.78%** Vote Share
Option B **Donald Trump** Mike Pence	**48.32%** Vote Share	**47.70%** Vote Share	**46.22%** Vote Share
N/A **Total Delta** Percentage (%)	**0.61%** Delta	**0%** Delta	**1.48%** Delta

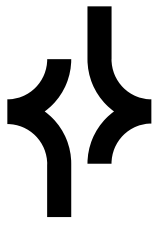| Index **2016 National** Presidential	**Dynamo** Simulation	**Real Results** Final Vote Share	**Polling** RCP Average
Option A **Hillary Clinton** Tim Kaine	**50.93%** Vote Share	**51.11%** Vote Share	**51.76%** Vote Share
Option B **Donald Trump** Mike Pence	**49.07%** Vote Share	**48.89%** Vote Share	**48.24%** Vote Share
N/A **Total Delta** Percentage (%)	**0.18%** Delta	**0%** Delta	**0.65%** Delta

Number
~2000
Respondents

Type
National
Representative

National Elections continued

Index **2012 National** Presidential	**Dynamo** Simulation	**Real Results** Final Vote Share	**Polling** RCP Average
Option A **Barack Obama** Joe Biden	**51.51%** Vote Share	**51.98%** Vote Share	**50.36%** Vote Share
Option B **Mitt Romney** Paul Ryan	**48.49%** Vote Share	**48.02%** Vote Share	**49.64%** Vote Share
N/A **Total Delta** Percentage (%)	**0.47%** Delta	**0%** Delta	**1.62%** Delta

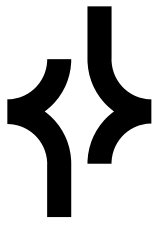| Index **2008 National** Presidential	**Dynamo** Simulation	**Real Results** Final Vote Share	**Polling** RCP Average
Option A **Barack Obama** Joe Biden	**53.12%** Vote Share	**53.65%** Vote Share	**53.93%** Vote Share
Option B **John McCain** Sarah Palin	**46.88%** Vote Share	**46.35%** Vote Share	**46.07%** Vote Share
N/A **Total Delta** Percentage (%)	**0.53%** Delta	**0%** Delta	**0.28%** Delta

Number
~2000
Respondents

Type
National
Representative

National Elections continued

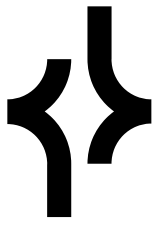| Index 2004 National Presidential	Dynamo Simulation	Real Results Final Vote Share	Polling RCP Average
Option A **John Kerry** John Edwards	**48.77%** Vote Share	**48.79%** Vote Share	**49.23%** Vote Share
Option B **George Bush** Dick Cheney	**51.23%** Vote Share	**51.21%** Vote Share	**50.77%** Vote Share
N/A **Total Delta** Percentage (%)	0.02% Delta	0% Delta	0.44% Delta

Number
~2000
Respondents

Type
State
Representative

State Elections

Aaru performs wells across state elections, accurately predicting vote share and outcome.

Index **2022 Illinois** Gubernatorial	**Dynamo** Simulation	**Real Results** Final Vote Share	**Polling** RCP Average
Option A **J.B. Pritzker** Democrat	**56%** Vote Share	**56.44%** Vote Share	**57.47%** Vote Share
Option B **Darren Bailey** Republican	**44%** Vote Share	**43.56%** Vote Share	**42.53%** Vote Share
N/A **Total Delta** Percentage (%)	**0.44%** Delta	**0%** Delta	**1.03%** Delta

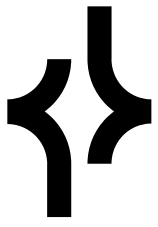| Index **2022 Michigan** Gubernatorial	**Dynamo** Simulation	**Real Results** Final Vote Share	**Polling** RCP Average
Option A **Gretchen Whitmer** Democrat	**55.86%** Vote Share	**55.38%** Vote Share	**50.52%** Vote Share
Option B **Tudor Dixon** Republican	**44.13%** Vote Share	**44.61%** Vote Share	**49.48%** Vote Share
N/A **Total Delta** Percentage (%)	**0.51%** Delta	**0%** Delta	**4.87%** Delta

State and Congressional Elections

Aaru outperforms at all levels, including state-wide and Congressional. Dynamo functions on areas as small as a single census tract (around 1200 people).

Index **2024 West Virgina** GOP Primary	Dynamo Simulation	Real Results Final Vote Share	Polling RCP Average
Option A **Moore Capito** Republican	46.50% Vote Share	45.32% Vote Share	46.77% Vote Share
Option B **Patrick Morrisey** Republican	53.50% Vote Share	54.68% Vote Share	53.23% Vote Share
N/A **Total Delta** Percentage (%)	1.18% Delta	0% Delta	1.45% Delta

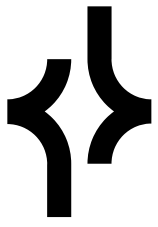| Index **2024 Texas CD-12** GOP Primary Runoff	Dynamo Simulation	Real Results Final Vote Share	Polling No Polls Available
Option A **Craig Goldman** Republican	63.75% Vote Share	63.20% Vote Share	—.—% Vote Share
Option B **John O'Shea** Republican	36.25% Vote Share	36.80% Vote Share	—.—% Vote Share
N/A **Total Delta** Percentage (%)	0.55% Delta	0% Delta	—.—% Delta

Approval Ratings

These results compare us to the latest national sentiment polls across topics such as Congressional approval and Tim Walz, Minnesota governor.

Index Congress Approval Rating	Dynamo Simulation	Real Results 538 Average	YouGov Recent Poll
Option A Approve Congress	20.19% Vote Share	19.5% Vote Share	15% Vote Share
Option B Disapprove Congress	60.00% Vote Share	65.2% Vote Share	61% Vote Share
Option C Unsure / Other Congress	19.81% Vote Share	15.3% Vote Share	14% Vote Share

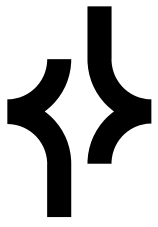| Index Tim Walz Approval Rating	Dynamo Simulation	Real Results 538 Recent Average	YouGov Recent Poll
Option A Approve Tim Walz	40.2% Vote Share	37.33% Vote Share	41% Vote Share
Option B Disapprove Tim Walz	27.8% Vote Share	27.38% Vote Share	30% Vote Share
Option C Unsure / Other Tim Walz	32% Vote Share	35.29% Vote Share	29% Vote Share

Number
~1000
Respondents

Type
National
Representative

Marketing Performance

Equally important to politics is marketing; captured below is our correlations from a large variety of tests. Generally, correlations above 0.7 are considered strong for the marketing domain.

Index Home Goods 2024	Lumen Simulation	Control Random Chance
Option A Purchase Intent (T1) Home Goods	0.93 Correlation	~0 Vote Share
Option B Purchase Intent (T2) Home Goods	0.78 Correlation	~0 Vote Share
Option C Need Fullfilment Home Goods	0.73 Correlation	~0 Vote Share

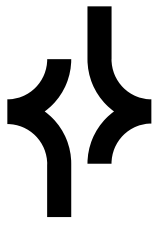| Index Drinks 2024	Lumen Simulation	Control Random Chance
Option A Purchase Intent (T1) Drinks	0.96 Correlation	~0 Vote Share
Option B Purchase Intent (T2) Drinks	0.74 Correlation	~0 Vote Share

Pop Culture Problems

Understanding how the agents replicate more commonplace opinion is important to ensuring we have an accurate, broad spectrum model.

Index	Dynamo	Surveys
Trolley Problem 2024	**Simulation**	**TIME**
Option A **Pull the lever** Kills 1	**89%** Vote Share	**~90%** Vote Share
Option B **Remain a bystander** Kills 5	**11%** Vote Share	**~10%** Vote Share

Index	Dynamo	Surveys
Skinny Jeans Gen Z's Opinion	**Simulation**	**YouGov**
Option A **Out Of Fashion** Per Gen Z	**53.32%** Vote Share	**52%** Vote Share
Option B **In Style / Not Sure** Per Gen Z	**46.68%** Vote Share	**48%** Vote Share

Index	Dynamo
The Matrix 2024	**Simulation**
Option A **Take the Red Pill** Wake up.	**30.2%** Vote Share
Option B **Take the Blue Pill** Stay asleep.	**69.8%** Vote Share

Conclusion

Our approach, leveraging agent-based simulations, has demonstrated remarkable accuracy in predicting election outcomes and consumer sentiments across various scales and contexts. From national presidential elections to local judge approvals, and from consumer product testing to marketing strategy evaluation, we have developed versatile solutions that often outperform traditional methods.

We have designed Aaru's technology to simulate entire geographies with demographically accurate agents, allowing for efficient and cost-effective large-scale simulations. Aaru offers complete customizability of simulations, which enables users to modify demographic distributions, environmental properties, and link simulations together. This flexibility makes Aaru hyper-extensible across any geography, demographic group, macro conditions, or other scenario.

In the 1980s, the finance industry captured more value than ever before through the expansion of data. With deep pricing and trading data, the most profitable firms became quantitative hedge funds that cut humans from the loop and traded in milliseconds.

In the future, every business will be run like a quant fund, moving the time-order of operations from end of day to end of second. Marketing campaigns, products, and businesses will evolve at lightning speed. Aaru will provide them the velocity of data they need to do so.