

Science Meets Shopping:

The AI Robot For Retail.

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INTRODUCTION: THE MALL OF THE FUTURE

AI spending by retailers will reach \$12b by 2023(1); here's how our new semi-autonomous artificial agents can increase your mall efficiency and promote consumer loyalty. Our agents are equipped with **natural language processing** using verbal and visual responses, voice input trained on Large Language Models (LLMs), and **first-order predicate logic** to better understand the sentiment, user intent, and inference.

Each AI Robot agent can sense surroundings with **computer vision** and human gesture recognition, enabling customers to navigate to stores or pay for parking on the agent's built-in card reader.



PRODUCT DISCOVERY

Genetic Algorithms: A heuristic optimization algorithm that improves over time. Personalized consumer recommendations based on past purchase history and other features.

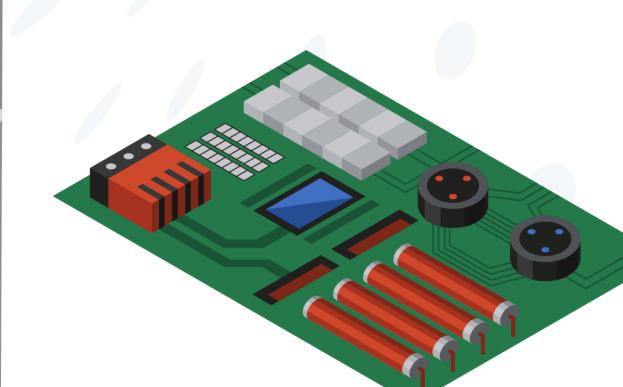
Omnichannel discovery: Mobile users are incentivized to use the malls' AI-assisted app by individually targeting promotions for online purchases. AI robot agents can push customized notifications based on their in-mall interactions, creating a more cohesive mall experience.



SMART SURVEILLANCE

Reduced Pilferage: Convolutional Neural Networks are highly effective in object recognition and can be integrated with mall security and inventory management systems. Studies have shown introducing AI in malls significantly reduces shoplifting and theft.

Mall surveillance: Anomaly detection can analyze video of suspicious behavior, notifying law enforcement. Facial recognition can detect known shoplifters with high accuracy, improving mall safety.



COMPONENT DESIGN

Hardware-based AI Agent Sensors: Our robots have computer vision depth sensors and can perceive and interact with people within a mall environment. Real-world data feeds the deep neural network, improving classification and accuracy over time.

Heads-up Display: The primary display has facial characteristics, expressions, and emotions. This persuasive agent builds trust and credibility, promoting positive human interactions. A secondary display is mounted on the chest for navigation, along with a card reader for parking validation and transactions, helping reduce wait time.

DISTRIBUTION OF USER INQUIRIES

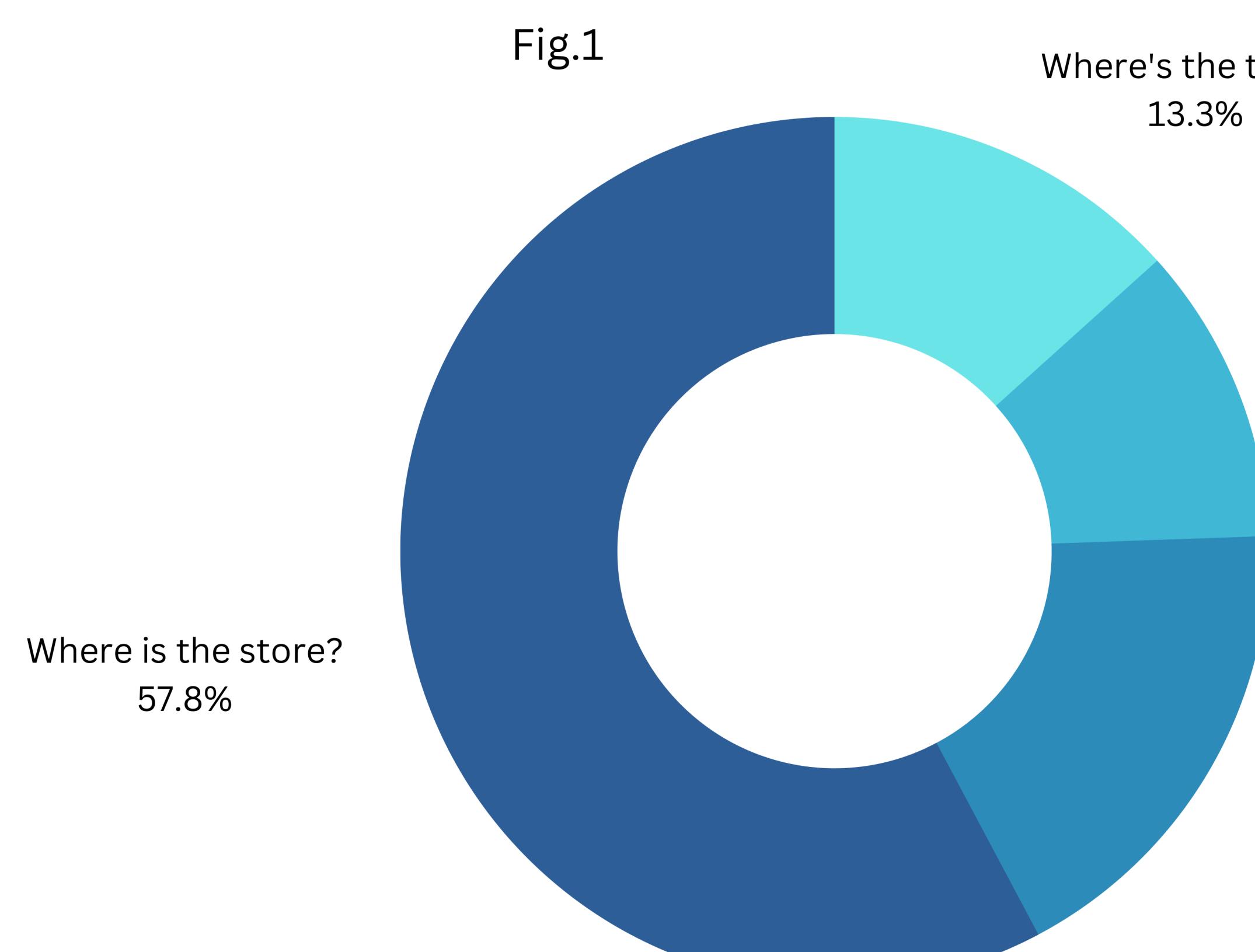


Fig. 1 A study by the Journal of Business and Retail Management in 2021(2) found that the most common type of queries asked by shoppers.

The introduction of AI in retail can save your consumers an average of 42 mins per visit, enabling more time to shop, consume & dine.

AVG TIME SAVED

42mins

TIME SAVED USING AI ASSISTANCE
BY CONSUMERS PER VISIT

CONCLUSION & ETHICAL CONSIDERATIONS

Dominance in AI assistant recommendations can arise when certain retail stores or products are unfairly prioritized over others due to biased weightings in the AI's decision-making process; adjusting these weightings through human input can help ensure more balanced and **impartial recommendations**. Examples such as GPT-3, and Bert by Google have **exposed LLM challenges**. AI's Robot's interaction with minors is a topic of debate and will require **government regulation and parental control**. Adolescent interactions can be addressed by **Explainable AI (XAI)**, providing transparency in AI decision-making. **Job displacement associated** with the introduction of AI assistants is a concern and can be mitigated by upskilling and training programs that complement the mall operators existing AI technologies.

Massive benefits are evident in AI-assisted agents, with considerable benefits to consumers. However, a balanced weighting must be found to mitigate the unintended consequences.

RELATED LITERATURE:

- 1) Journal of Business and Retail Management Research (<https://jbrmr.com/issues&iid=43>)
- 2) Genetic Algorithms to Forecasting (<https://www.mdpi.com/2227-7099/9/1/6>)
- 3) Convolutional Neural Networks for Computer Vision (https://www.researchgate.net/publication/323174279_A_Guide_to_Convolutional_Neural_Networks_for_Computer_Vision)
- 4) Analysis of Artificial Intelligence Techniques in Surveillance Video Anomaly Detection (<https://www.mdpi.com/2076-3417/13/8/4956>)

