

Xinyue (Gina) Zhao

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Research Objective

I study how language and visual content influence consumer engagement using causal machine learning and generative AI. My work focuses on identification under high-dimensional confounding and on developing scalable methods for content optimization in digital environments.

Education

Temple University, Fox School of Business

Ph.D. in Quantitative Marketing (in progress) Advisor: Prof. Xueming Luo

Philadelphia, PA

Aug. 2025 - Present

Cornell University

Master of Engineering in Engineering Management - Analytics Track

Ithaca, NY

Aug. 2021 - Dec. 2022

- **Relevant Courses:** Machine Learning, Data Mining, Digital Marketing, Data-driven marketing, Customer Analysis and Strategy

University of Nottingham

Bachelor of Engineering in Mechanical Engineering

Ningbo, China

Sep. 2017 - May. 2021

- **Relevant Courses:** Probability and Statistics, Linear Algebra, Engineering Mechanics, Thermodynamics and Fluid, Control Engineering

Research Experience

AIMS – Agentic AI for Visual Content Optimization - *PhD Research*

Feb. 2026 – Present

- Propose a closed-loop agentic AI system for content generation, evaluation, and optimization
- Plan to develop a representation-based causal ML framework to estimate the effect of visual novelty from high-dimensional image features
- Plan to design a multi-agent architecture (generation, critic, experimentation, optimization) for scalable policy learning
- Plan to conduct a field A/B experiment to compare human, static AI, and agentic AI workflows

GENI – GenAI-Assisted Causal Inference for Text Data - *PhD Research*

Sep. 2025 – Present

- Develop a causal ML framework (GENI) integrating LLM embeddings with adversarial representation learning and orthogonal DML for identification under high-dimensional confounding
- Implement a two-stage pipeline with GRL-based deconfounding and Neyman-orthogonal estimation of ATE/HTE
- Apply to large-scale randomized data (160M+ impressions), demonstrating bias and sign reversal in conventional estimators
- Construct an agentic recommendation module for counterfactual policy generation based on estimated causal effects

Human-Likeness and the Uncanny Valley - *Research Assistant*

Sep. 2024 – Dec. 2024

- Processed 1,059 images and 237 videos scraped from Instagram Artificial Intelligence influencers to study the Uncanny Valley effect in virtual faces; labeled and filtered images (face area >5%) using AWS Rekognition, yielding 180 high-quality images
- Extracted 4,432 screenshots from videos using FFmpeg in Python; applied pHash for deduplication, reducing to 120 unique video images; combined these with 180 images from pure images to create a balanced dataset of 300 AI influencer face images
- Designed and implemented a Qualtrics survey to assess human-likeness, realism, and eeriness, collecting ratings from 150 participants, resulting in a structured dataset of 3,000 data points for quantitative analysis of user perceptions

Analysis of Adolescent Suicide Rates at the County Level - *Research Assistant*

May. 2024 - Present

- Integrated a decade (2013–2022) of data from CDC Wonder (using ICD-10 codes), CCD (Common Core of Data), and County Health Rankings & Roadmaps by linking FIPS codes, compiling 54 county-level features to predict suicide rates in Python
- Implemented multi-class classification with data standardization to forecast adolescent suicide risk (low, moderate, high), using SMOTE to improve model balance and enhance predictive performance
- Selected LightGBM as the optimal model (weighted F1-score: 0.987, AUROC: 0.994) and leveraged SHAP values to identify 20 critical variables across demographic and socioeconomic themes within three risk classes
- Developed county-level Suicide Vulnerability Indexes (SVIs) based on 20 variables across different classes, visualized with Plotly for targeted insights; the SVIs enable data-driven resource allocation and strategic interventions, supporting youth mental health initiatives

Customer Behavior Lab - Research Volunteer**Mar. 2024 – Jun. 2024**

- Leveraged Hugging Face transformers in Python to perform advanced sentiment analysis on SPSS data collected from questionnaires, identifying key sentiments; developed Python scripts to map geographic coordinates to county-level data
- Conducted A/B tests on Facebook to quantify marketing effectiveness and presented data insights for the professor's review
- Investigated the impact of abstract vs. concrete thinking on customer behaviors and emotional responses; collaborated with the professor to refine research directions in marketing strategies
- Analyzed literature on clean energy marketing strategies, and government policies, summarizing key research gaps for further study

Predicting the Valuation of Unicorn Startups - Data Scientist**Mar. 2022 - May. 2022**

- Applied ML models (KNN, Decision Tree, SVM, Logistic Regression) in R to predict startup valuation, used boosting in random forest to obtain an accuracy of 76.77% (highest across all attempts)
- Created ETL pipelines to clean and analyze unicorn startups' valuation datasets in Python and SQL; composed the data analysis and research result into actionable business suggestions to the company leaders for maintaining and improving startups' valuations

Data-Driven Customer Segmentation for Hotel Marketing Strategy - Data Scientist**Oct. 2021 - Dec. 2021**

- Employed Principal Component Analysis (PCA) to distill key factors, and facilitated the segmentation of 79,326 hotel customers into six distinct groups for more precise marketing strategies
- Implemented K-Means clustering in R to identify high-value customer segments, enhancing the effectiveness of marketing campaigns
- Revealed booking patterns through Exploratory Data Analysis, leading to successful adjustments in off-peak promotional campaigns
- Developed actionable, data-driven recommendations for hotel management, and increased revenue from targeted customer segments

Analysis of PM2.5 and PM10 Index of Air Pollution Particles in Ningbo Metro - Data Analyst**Jun. 2018 - May. 2020**

- *Co-authored a paper with the professor and published it at the international conference - ISNMHMT2020*
- Led a 4-member team to measure the concentration of PM2.5 & PM10 in various periods at 13 stations in Ningbo Metro for a month; cleaned and analyzed collected data and used Tableau for visualization
- Explored causes of air pollution in subway stations to help improve air quality and subway-taking experience; summarized research results and actionable suggestions into the paper

Publications/Working Papers

AIMS: Agentic AI for Visual Content Optimization*(with Professor Xueming Luo)*

Work in Progress (Agentic AI, Causal learning, Image data)

GENI: GenAI-Assisted Causal Inference for Emotional Language*(with Professor Xueming Luo)*

Manuscript in Preparation (Causal ML, Double ML, LLM-based representation learning)

Youth Suicide Vulnerability Index: A County-Level Machine Learning Approach*(with Professor Huaiyang Zhong, Professor Sait Tunc and Professor Marisa E. Marraccini)*

Manuscript in Preparation (XGBoost, SHAP-based interpretability)

Conference Presentations

Symposium on Artificial Intelligence in Marketing, University of Wisconsin–Madison — Presented, 2026**The Business Implications of Generative AI**, MIT — Presented, 2026**Conference on Artificial Intelligence, Machine Learning, and Business Analytics**, Columbia Business School — Presented, 2025**Funding & Awards**

RAIS Seed Funding Competition, Temple University Fox School of Business — \$2,000**Skills and Expertise**

Methods: Causal Inference, Causal ML, Double ML, Representation Learning, Experimental Design**Machine Learning:** High-Dimensional Modeling, Gradient Boosting, Deep Learning**Programming:** Python, R, Stata, SQL**Tools:** Qualtrics, MTurk, AWS Rekognition**Domain:** Quantitative Marketing, Consumer Analytics, Digital Marketing

Industry Experience

Think Academy International Education Inc.

San Jose, CA

Future Leadership Program - Marketing

Mar. 2023 - May. 2025

- Led social media campaigns with 20 Key Opinion Leaders, generating \$30,000 in profit; optimized ad performance, increasing CTR by 3% and conversions by 1.5x; grew social media followers by 3,000 and generated 300 leads through inbound marketing in 2 months
- Expanded marketing channels: drove field marketing efforts resulting in 50 leads, organized K12 school webinars securing 1,000 leads, and grew private domain traffic from 500 to 3,000 members
- Conducted market analysis using secondary data to inform strategic development plans, examining residents' demographics, including income levels and education attainment

JoinedPrice Technologies, Inc. | Soca (A Job-seeking Platform)

Redmond, WA (Remote)

Marketing Analyst Intern

Mar. 2023 - Mar. 2023

- Strategized SEO plan (keyword, content, on/off-page) elevating Soca's organic search rankings by 35 places
- Extracted 5K+ salary data points from 2 public websites using Python (Selenium, BeautifulSoup) for feature development
- Conducted statistical data analysis with SQL queries, consolidating multi-source information to aid job seekers in negotiation

Qianyan Technology (Foshan) Co., Ltd

Foshan, China (Remote)

Business Intelligence Analyst Intern

Mar. 2020 - May. 2020

- Conducted thorough industry research, compiling comprehensive business intelligence from 12 online & offline dialect education platforms and 10 dialect-related smart electronics
- Authored and presented 4 detailed industry analysis reports to senior executives, aiding informed decisions regarding market entry
- Performed competitive product analysis from 4 dimensions (customer base, product, profit model, and business model)
- Identified and reported 3 shortcomings of our product and proposed potential solutions to engineering

CNH Industrial

Shanghai, China

Purchasing Assistant

Jun. 2019 - Aug. 2019

- Investigated the casting industry and made a list of 50 potential vendors; created a list of criteria for vendor selection based on business requirements, narrowing the list down to around 20 vendors
- Introduced our company's basic information and product requirements to the selected vendors; assisted in establishing business relations with 3 overseas vendors and 5 local vendors
- Evaluated 10 current vendors' financial situation with their financial statements to ensure they have positive cash flows

Community Service

Youth Volunteer Association of UNNC - Lead of Technical Department

Oct. 2017 - May. 2018

- Planned a 300-participant charity party and participated in the promotion, theme planning, activity programming, and light directing
- Owned and operated its WeChat official account, designed posters, and edited videos with PS & Adobe Premiere to publicize activities