Master Thesis Topics

Chair of Marketing & Customer Insight

LLM-based Dialogue Systems for Psychological Assessments

AI-driven dialogue systems are opening new possibilities for understanding how people behave in conversations, conflicts, and interpersonal situations. Traditional evaluation scales rely heavily on self-assessment or the manual analysis of participants' responses - such as word choice, emotional tone, or topic focus. With modern conversational AI, however, we can simulate highly personalized, realistic discussion partners and capture behavioural signals in a controlled yet naturalistic way.

This master's thesis gives you the opportunity to explore this emerging approach. You will develop an LLM-based dialogue system that can be used as an experimental tool for behavioural research. The final system should be easy to deploy and openly accessible for other researchers. In addition, you will design and run empirical studies to test the reliability and comparability of AI-mediated behavioural measurements, both within groups and in comparison to traditional evaluation methods.

This thesis can be written in either English or German.

If you have coding experience and are comfortable working with LLMs, please contact

Robin Frasch, robin.frasch@uni-hamburg.de

Related Literature:

- Kjell, O. N. E., Kjell, K., & Schwartz, H. A. (2024). Beyond rating scales: With targeted evaluation, large language models are poised for psychological assessment. *Psychiatry Research, 333*, 115667. https://doi.org/10.1016/j.psychres.2023.115667

- D. Dumas, S. Greiff, and E. Wetzel, "Ten Guidelines for Scoring Psychological Assessments Using Artificial Intelligence," European Journal of Psychological Assessment, vol. 41, no. 3, pp. 169–173, May 2025, doi: 10.1027/1015-5759/a000904.

- Ke, L., Tong, S., Cheng, P. *et al.* Exploring the frontiers of LLMs in psychological applications: a comprehensive review. *Artif Intell Rev* 58, 305 (2025). https://doi.org/10.1007/s10462-025-11297-5

- Ravenda, F., Preti, A., Poletti, M. *et al.* Rethinking psychometrics through LLMs: how item semantics shape measurement and prediction in psychological questionnaires. *Sci Rep*15, 37313 (2025). https://doi.org/10.1038/s41598-025-21289-8

AI-based Election Manipulation and How to Defend Against it

AI is rapidly transforming the landscape of political influence - and with it, the vulnerabilities of modern democracies. While election manipulation has a long history, the speed, scale, and sophistication enabled by AI tools introduce entirely new risks. From automated persuasion systems to subtle data poisoning techniques, AI-driven methods could surpass traditional manipulation strategies in both reach and impact.

This master's thesis offers you the opportunity to explore these emerging threats in depth. You will investigate how AI could be weaponized as a destabilizing force, examining methods such as adversarial machine learning, training-data manipulation, and the large-scale deployment of powerful political bots. Approaching the problem from a red-team perspective, you will map out realistic attack vectors that democratic societies may soon face. Building on these insights, you will then focus on practical defense strategies. This includes designing and implementing countermeasures, developing evaluation metrics, and empirically testing how well different protection mechanisms mitigate the identified risks.

This thesis can be written in either English or German and could potentially support two students. So, if you want to tackle this with a friend and go red-team/blue-team, please reference that in your application.

If you are confident in your coding skills and are interested in strengthening democratic resilience against emerging AI-driven threats, please get in touch with

Robin Frasch, robin.frasch@uni-hamburg.de

Related Literature:

- Romanishyn A, Malytska O, Goncharuk V. AI-driven disinformation: policy recommendations for democratic resilience. Front Artif Intell. 2025 Jul 31;8:1569115. doi: 10.3389/frai.2025.1569115. PMID: 40821951; PMCID: PMC12351547.

- Panditharatne, M., & Hasan, S. (2024, May 16). *How to detect and guard against deceptive AI-generated election information.* Brennan Center for Justice. https://www.brennancenter.org/our-work/research-reports/how-detect-and-guard-against-deceptive-ai-generated-election-information

- Sam Stockwell, Megan Hughes, Phil Swatton and Katie Bishop, "AI-Enabled Influence Operations: The Threat to the UK General Election," *CETaS Briefing Papers* (May 2024).

- Federal Ministry of the Interior (BMI). (2025, January 22). *Disinformation and discreditation campaigns, cyber attacks, espionage and sabotage: Protecting the 2025 Bundestag elections from hybrid threats*. https://www.bmi.bund.de/SharedDocs/schwerpunkte/EN/disinformation-election/disinformation-election-artikel.html

Implications of Agentic Commerce – A Technical Framework

Agentic AI systems are opening new possibilities for how consumers discover, evaluate, and purchase products and services. Instead of interacting with isolated recommendation systems or search interfaces, users can increasingly rely on AI agents that act as personalized concierges: systems with deep knowledge of individual preferences, goals, and constraints that proactively support decision-making and delegate parts of the purchasing process. Prior research suggests that such agents can have positive psychological effects, for example by reducing cognitive load, increasing perceived autonomy, and enhancing satisfaction and trust in complex choice environments.

This master's thesis gives you the opportunity to explore this emerging technology from a technical and conceptual perspective. Building on existing work you will design and develop a framework that structures the interaction between agentic systems and current suppliers of products and services. The goal is to identify how agent-based commerce can be leveraged in a way that creates value for users, platform providers, and suppliers alike.

Your work will focus on the technical architecture and interaction mechanisms required for such an ecosystem, including questions of information access, preference representation, delegation of actions, and coordination between agents and supplier systems. Depending on your interests, the thesis may include prototypical implementations, simulations of agent–supplier interactions, or empirical evaluations of user experience and perceived benefits in agent-supported commerce scenarios.

This thesis can be written in either English or German.

If you are interested, please get in touch with

Robin Frasch, robin.frasch@uni-hamburg.de

Related literature:

- Allouah, A., Besbes, O., Figueroa, J. D., Kanoria, Y., & Kumar, A. (2025). *What Is Your AI Agent Buying? Evaluation, Implications and Emerging Questions for Agentic E-Commerce (No. arXiv:2508.02630). arXiv.* https://doi.org/10.48550/arXiv.2508.02630

- Rothschild, D. M., Mobius, M., Hofman, J. M., Dillon, E. W., Goldstein, D. G., Immorlica, N., Jaffe, S., Lucier, B., Slivkins, A., & Vogel, M. (2025). *The Agentic Economy (Version 2). arXiv.* https://doi.org/10.48550/ARXIV.2505.15799

- Schumacher, K., & Roberts, R. (o. J.). *Agentic AI promises to radically remake the entire shopping experience. Here's a glimpse into the near future—And what merchants, players, and platforms need to know in order to thrive.*

Implications of Agentic Commerce – A Psychological view

AI agents are beginning to make decisions *for* consumers — from comparing options to completing purchases. While this can save time and effort, it also raises important psychological questions. How do people feel when an AI chooses on their behalf? Do they anticipate more or less regret if a decision turns out poorly? When does delegation feel helpful, and when does it feel like giving up too much control?

This thesis explores how consumers experience **agentic AI** from a psychological perspective, focusing on emotions such as **anticipated regret**, perceptions of **control and responsibility**, and judgments of **fairness and trust**. You will examine how different levels of AI autonomy and transparency shape users' comfort with delegation and their satisfaction with outcomes.

Depending on your interests, the project may involve designing simple agent scenarios and testing them in experiments or simulations to understand when people are willing to let AI decide — and when they are not.

This thesis can be written in either English or German and have a literature or empirical focus.

If you are interested, please get in touch with

Magdalena Heynicke, magdalena.heynicke@uni-hamburg.de

Related literature:

- Schumacher, K., & Roberts, R. (o. J.). *Agentic AI promises to radically remake the entire shopping experience. Here's a glimpse into the near future—And what merchants, players, and platforms need to know in order to thrive.*

- Simonson, Itamar. "The Influence of Anticipating Regret and Responsibility on Purchase Decisions." *The Journal of Consumer Research* 19, no. 1 (1992): 105–18.

- Branco, Fernando, Monic Sun, and J. Miguel Villas-Boas. "Too Much Information? Information Provision and Search Costs." *Marketing Science* 35, no. 4 (2016): 605–18. https://doi.org/10.1287/mksc.2015.0959.

AI as a Synthetic Consumer: Evaluating the Validity of AI-Generated Responses in Advertising Research

This thesis examines whether AI-generated survey responses can realistically reproduce human evaluations of advertising stimuli. The student will conduct an online experiment comparing human participants' evaluations of advertisements with AI-generated responses to the same survey. The analysis compares both datasets in terms of average evaluations, response variability, and relationships between constructs such as ad liking, credibility, and purchase intention. The findings contribute to debates on the reliability and risks of AI-supported market research methods in advertising contexts.

Methods: Online experiment, AI prompting, regression analysis
Application: Advertising & market research practice

If you are interested, please get in touch with

Claus Hegmann-Napp, claus.hegmann@uni-hamburg.de

Related Literature

- Kirk, C.P., Childs, M.L., & Rifon, N.J. (2025). "The AI-Authorship Effect: Understanding Authenticity, Moral Disgust, and Consumer Loyalty." *Journal of the Academy of Marketing Science*, 53(1), 123–145.

    - Seven pre-registered studies on consumer responses to AI vs. human-authored
    - Shows effects on word-of-mouth, brand loyalty, and emotional responses to ads
    - Identifies authenticity and moral disgust as mediating factors

- Arora, N., Chakraborty, I., & Nishimura, Y. (2024**).** "EXPRESS: AI-Human Hybrids for Marketing Research: Leveraging Large Language Models as Collaborators." *Journal of Marketing*, 88(3), 267–289.

    - Demonstrates LLM performance in simulating consumer responses
    - Addresses both qualitative and quantitative research applications

- Li, P., Castelo, N., Katona, Z., & Sarvary, M. (2024). "Determining the Validity of Large Language Models for Automated Perceptual Analysis." *Marketing Science*, 43(2), 254–266.

    - Achieves 75%+ agreement between human and LLM-generated advertising evaluations
    - Tests construct relationships including preference and liking measures
    - Validates response patterns for advertising effectiveness assessment

- NIM (Nuremberg Institute for Market Decisions). (2025). "Consumer Attitudes Toward AI-Generated Marketing Content: An Experimental Study." *Market Research Review* [In Press]

    - Two experiments on consumer perception of AI-generated vs. human-generated ads
    - Shows context and product category dependent effects
    - Provides insights on when AI-generated ad evaluations are representative