

Rapport-Building in Human-Agent Interaction

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Abstract [\(should be within 1st page\)](#)

This dissertation addresses the challenge of building and recovering rapport in human-agent interaction. Rapport is the sense of connection and mutual understanding between conversational partners, which influences user experience and outcomes in collaborative tasks. Yet how artificial agents can systematically foster it remains underexplored. Through a series of studies, this dissertation progressively extends the scope of rapport-oriented agent design, organized around three interconnected themes: cultivating, understanding, and recovering rapport. Together, these themes form a comprehensive view of rapport in human-agent interaction. On the cultivating side, we propose a rapport-building dialogue strategy for large language model (LLM)-based agents grounded in psychological theories of rapport, demonstrating that free-form dialogue management achieves the highest perceived rapport among users. Complementing this, we further propose an LLM-based motion generation framework to cultivate nonverbal behavior, enabling more engaging human-agent interaction beyond verbal exchange alone. To move beyond self-report measures, we also seek to understand rapport through analyses of emotion, behavioral signals, dialogue structures, and personality traits, examining whether humans apply similar rapport behaviors when interacting with dialogue agents as they do with other humans. This empirical foundation serves as a basis for developing objective evaluation metrics and informing future improvements to rapport-building strategies. Finally, recognizing that errors are inevitable in human-agent interaction and can disrupt rapport, we systematically investigate how apologies as a means of rapport recovery should be delivered, through a series of crowdsourcing studies examining apology style, emotional intensity, and nonverbal behavior.