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# **Efficiency in Solving the Traveling Salesman Problem as Predictor of Perceived Humanness**

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## **Abstract**

Many studies have demonstrated that motion can convey intentionality and mental goals; for example, how do we distinguish between a moving avatar that is controlled by a human being and a moving AI agent that is controlled by a computer? To answer this question, we use the travelling salesman problem (TSP), since it has been widely studied and, when the number of targets is limited, can be resolved optimally by both computers and human beings, even though with the use of different computational strategies (MacGregor & Chu, 2000). We asked 25 online participants to evaluate the performance of 5 human subjects and one AI agent in solving the TSP. The performances varied in efficiency. Results show that optimality is correlated with the perceived humanness of the agent: a lower efficiency in carrying out the task is perceived as a distinctly human characteristic. Future directions include the analysis of the agent's gaze direction.