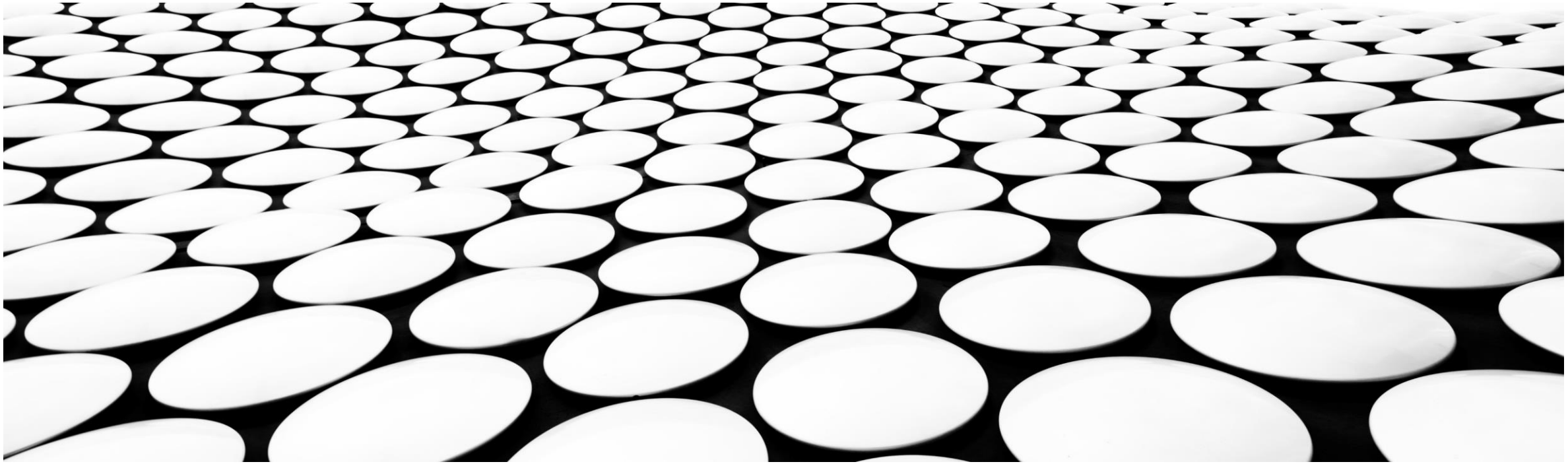
災害避難及び、群衆事故防止等のための社会システム

AIIT 修了生コミュニティ 2025年度



- 論文名　　: Modeling evacuation decision-making and discussion using generative AI.
- 論文発表先 : SCAI
- 発表日　　: July 13-19,2025
- 著者　　: Fumio Tanabe, Kosuke Hayashi, Satoshi Yamazaki, Rie Sato, Hideki Murakoshi, Hisashi Hayashi
- Abstract :

"This study introduced a generative AI-based agentto overcome the limitations of conventional rule-based multi-agentsimulations and proposed a simulation that considerspsychological factors and information transmission duringdisasters. The performance of the proposed agent and simulationwas verified for disaster scenarios such as earthquakes andtyphoons. The simulation predicts evacuation behavior via agentconversations, and the results were compared with past disasterdata to evaluate realism. Furthermore, the causes of discrepancieswere analyzed to improve prediction accuracy. This researchcontributes to enhancing the understanding of evacuationbehavior during disasters and the development of realistic disasterresponse simulations."

- 論文名　　: Improving Evacuation Efficiency through Dynamic Matching of Evacuees and Rescuers.
- 論文発表先 : SCAI
- 発表日　　: July 13-19,2025
- 著者　　: Kosuke Hayashi, Fumio Tanabe, Satoshi Yamazaki, Rie Sato, Hideki Murakoshi, Hisashi Hayashi
- Abstract:

"Optimal matching methods for evacuees requiringassistance and rescuers in the event of an earthquake in a largecommercial facility were evaluated using a multi-agent simulation.Among the uniformly applied methods across all floors, the exitdistance priority (near) method, which prioritizes assistingevacuees near exits, proved to be the most efficient. It wasconfirmed that the presence or absence of assistance and thematching method significantly affect evacuation time. In addition,changing the matching method only on the third floor helpeddisperse congestion at staircases, suggesting a reduction in overallevacuation time. Furthermore, selecting appropriate matchingmethods for each floor was shown to optimize evacuationassistance."

- 論文名　　: Conversation Simulation and Behavioral Change Design for Evacuation Decision-Making
- 論文発表先 : KES
- 発表日　　: Sep 10-12, 2025
- 著者　　: Fumio Tanabe, Kosuke Hayashi, Satoshi Yamazaki, Rie Sato, Hideki Murakoshi, Hisashi Hayashi
- Abstract :

"This study introduces multi-agent conversation models that utilize generative AI to overcome the challenges posed bytraditional rule-based multi-agent simulations. It proposes an effective method for issuing appropriate evacuation instructionsmethod through simulations considering psychological factors and information transmission during disasters. Using anearthquake as the disaster scenario, the correlation between agent conversations and evacuation behaviors was evaluated, and theeffectiveness of various evacuation instructions were compared. Additionally, the evacuation instruction methods were analyzed,and the improvements in prediction accuracy were verified. This research enhances the understanding of evacuation behaviorduring disasters and contributes to the development of realistic disaster response simulations, offering insights for improvingactual evacuation instruction methods."

- 論文名　　：銀行方式による企業間人材共有の効率化
  (Banking Method: Efficient Human Resource Sharing between Companies)
- 論文提出先：人工知能学会論文誌 40(5) 2025年9月
- 著者　　：齋藤 美紀, 阿部 健太, 林 久志
- Abstract　：

"We propose a peer-to-peer (P2P) human resource sharing platform using stablecoins (Share-P) to address thelabor shortage in Japanese small and medium-sized enterprises by equalizing their busy and idle periods. However,repeated sharing resulted in a skewed distribution of Share-P, leading to two groups: wealthy companies with toomuch Share-P and 0pt companies without any Share-P, negatively impacting the efficiency of human resource sharing. To address the challenge of 0pt companies in busy periods unable to borrow human resources due to Share-Pimbalances, our objective is to create a mechanism where a third party lends Share-P, thus enhancing the overalleffectiveness of the human resource sharing platform. The banking Method has been proposed to solve the issue ofShare-P bias. The method involves creating a Share-P bank at the center of the human resource-sharing platform.Each company must deposit a predetermined proportion of Share-P based on their employee count. This will helpto facilitate smooth human resource sharing among companies within the platform. If any company faces a shortageof Share-P, the bank will provide loans to them. The ultimate goal of this approach is to help companies carry outtheir operations more efficiently. The exchanged employees participate in contract-based secondments, remainingformally employed by their original companies while temporarily assigned to others. Ideally, they are multi-skilledgeneralists, as they are better suited for human resource sharing. Specialists can develop broader capabilities and amore versatile skill set through repeated sharing. This model is particularly effective for companies that frequentlyexchange employees within a corporate group or small and medium-sized enterprises (SMEs) seeking a more flexibleworkforce. We used NetLogo to create the artificial platform for multi-agent simulations called the human resourcesharing platform. We also tested a proposed banking Method solution to address Share-P imbalances. The resultsshowed that when we compared human resource sharing alone with the banking Method (using a deposit rate of 30%and a financing rate of 30%), there was a 20% decrease in busyness and idleness per employee and a 10% increase inthe number of borrowed employees per year. This effectiveness is due to the improved mobility of human resourcesutilizing Share-P through the banking method."