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Simulation analysis of dual-end queuing ride-hailing system considering driver-side queue management

Tang, M.C.[a,b,*], **Cao, J.**[a], **Gong, D.Q.**[c], **Xue, G.**[c], **Khoa, B.T.**[b]

[a]Xuzhou University of Technology, P.R. China
[b]Industrial University of Ho Chih Minh City, Vietnam
[c]International Center for Informatics Research, Beijing Jiaotong University, P.R. China

ABSTRACT

Ride-hailing services have transformed urban transportation through convenience yet introduced new complexities around efficiency and traffic management. This study investigates the dual-queuing problem in ride-hailing from the driver perspective using a multi-agent simulation approach. The focus is dissecting the dynamics between driver search times and passenger wait times, which critically influence operational efficiency especially during peak demand. Exploring these interactions aims to uncover insights that could improve service efficiency and customer satisfaction. Addressing such ride-hailing challenges is vital not just for individual providers but also for advancing sustainable mobility across rapidly growing metropolitan regions. Enhanced efficiency connects to broader urban development narratives around livability, accessibility, and responsible mobility ecosystems.

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Keywords:
Dual-end queuing;
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**Corresponding author:*
Tang12290@gmail.com
(Tang, M.C.)

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Izvirni znanstveni članek

Simulacijska analiza sistema prevoznih storitev z dvema stranema čakalne vrste ob upoštevanju upravljanja čakalne vrste s strani voznika

Tang, M.C.[a,b,*], **Cao, J.**[a], **Gong, D.Q.**[c], **Xue, G.**[c], **Khoa, B.T.**[b]

[a]Xuzhou University of Technology, P.R. China
[b]Industrial University of Ho Chih Minh City, Vietnam
[c]International Center for Informatics Research, Beijing Jiaotong University, P.R. China

POVZETEK

Storitve prevoza so spremenile mestni prevoz z zagotavljanjem udobja, vendar so prinesle nove težave povezane z učinkovitostjo in upravljanjem prometa. Ta študija raziskuje problem dvojnega čakanja v storitvah prevoza z voznikom z vidika voznika z uporabo pristopa simulacije z več agenti. Poudarek je na razčlenitvi dinamike med časom iskanja voznikov in časom čakanja potnikov, ki odločilno vpliva na učinkovitost delovanja, zlasti med največjim povpraševanjem. Namen raziskovanja teh interakcij je pridobiti spoznanja, ki bi lahko izboljšala učinkovitost storitev in zadovoljstvo strank. Reševanje takšnih izzivov na področju storitev prevoza je bistvenega pomena ne le za posamezne ponudnike, temveč tudi za spodbujanje trajnostne mobilnosti v hitro rastočih metropolitanskih regijah. Večja učinkovitost je povezana s splošnimi smernicami razvoja mest, ki se nanašajo na primernost za življenje, dostopnost in trajnostne sisteme mobilnosti.

PODATKI O ČLANKU

Ključne besede:
Čakalna vrsta z dvema stranema;
Simulacija z več agenti;
Učinkovitost delovanja sistema;
Skupno število potnikov

**Kontaktna oseba:*
Tang12290@gmail.com
(Tang, M.C.)

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