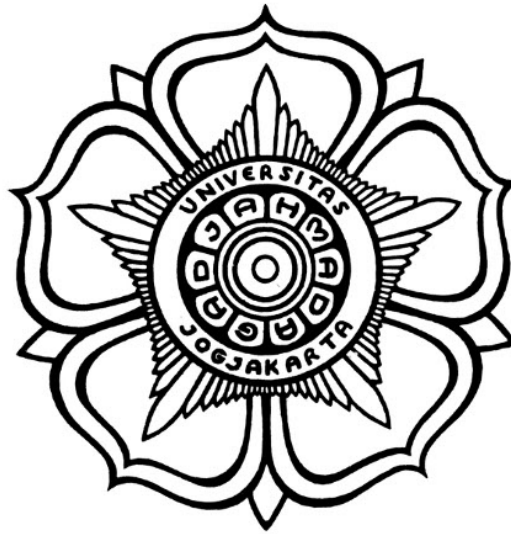


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NEIGHBORHOOD SEARCH (ALNS) HEURISTIC AND DYNAMIC  
TWO-LEVEL OPTIMIZATION FOR SOLVING SPACE  
EFFICIENCY IN FIRST-MILE DELIVERY**

THESIS



By :

**SASHA ANNABEL**

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**FACULTY OF MATHEMATICS AND NATURAL SCIENCES**

**UNIVERSITAS GADJAH MADA**

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Telah dipersiapkan dan disusun oleh

Sasha Annabel (IUP)

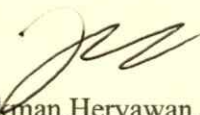
22/496780/PA/21361

Telah dipertahankan di depan Tim Penguji  
pada tanggal 08 April 2026

Susunan Tim Penguji



Rifki Afina Putri, S.T., M.S, Ph.D.  
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Mengetahui,  
a.n. Dekan FMIPA UGM  
Wakil Dekan Bidang Pendidikan, Pengajaran  
dan Kemahasiswaan



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