

# Contents

<b>Abstract</b>	<b>i</b>
<b>Resumen</b>	<b>ii</b>
<b>Acknowledgements</b>	<b>iv</b>
<b>List of Abbreviations</b>	<b>ix</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Hypotheses . . . . .	3
1.2 Objectives . . . . .	3
1.2.1 General objective . . . . .	3
1.2.2 Specific objectives . . . . .	3
1.3 Thesis organization . . . . .	4
<b>2 Theoretical Framework</b>	<b>5</b>
2.1 Graph Theory . . . . .	5
2.2 Shortest Path Problem . . . . .	8
2.2.1 Shortest Path Problem: a basic formulation . . . . .	8
2.2.2 Dynamic Shortest Path Problem . . . . .	9
2.2.3 Stochastic Shortest Path Problem . . . . .	10
2.2.4 Dynamic and Stochastic Shortest Path Problem . . . . .	11
2.3 K-Shortest Loopless Path Problem . . . . .	15
2.4 Understanding Prognostic based on Particle Filter . . . . .	16
2.4.1 Particle Filter . . . . .	16
2.4.2 Prognostic based on Particle Filter . . . . .	18
<b>3 Description of Models</b>	<b>21</b>
3.1 Road networks and traffic information model . . . . .	21
3.1.1 Modeling a Road Network . . . . .	21
3.1.2 Stochastic traffic model . . . . .	22
3.2 EV energy consumption model . . . . .	29
<b>4 Proposed routing strategy</b>	<b>34</b>
4.1 Heuristic for finding path candidates . . . . .	35
4.2 Performance evaluation of path candidates . . . . .	39
4.3 Prognostic based decision making approach for finding the optimal path . . . . .	40

4.4	Computing en-route path updates . . . . .	43
4.5	Observations related with the proposed PDM based strategy to solve the EV-DSSPP. . . . .	46
<b>5</b>	<b>Simulation Analysis</b>	<b>48</b>
<b>6</b>	<b>Conclusions</b>	<b>54</b>
	<b>Bibliography</b>	<b>56</b>