



Masters Desertion Showcase Year 2023

Department: Computer Science and Information Technology Programme: Master in Computer Science Specialization: Data Science	
1	Title of the Thesis Potholes Detection on Roads
2	Abstract <p>One of the main reasons for traffic congestion, accidents, and vehicle wear and tear is the existence of potholes on the road. These potholes are the most prevalent structural flaw on a road and are frequently caused by the ageing of the structure, heavy rains, and heavy traffic, a poor or weak foundation, etc. Due to heavy rainfalls and flooding in Pakistan this year, the road conditions have been deteriorated as a result of potholes. Routine maintenance and inspection of roads are becoming an exceedingly challenging undertaking. These potholes can be repaired if they are found and reported to the appropriate departments. In this study, we will examine the feasibility and accuracy of imaging in the field of pothole detection in an effort to solve this issue. We will use various machine learning techniques and deep learning architectures to automatically detect potholes on roads after gathering a significant amount of data and building a dataset with images of potholes in various conditions and scenarios. The accuracy and performance of all the used models will be evaluated and compared in order to achieve the best outcome for the research application.</p>
3	Impact on Sustainability of Urban Regions or SDG-11 "Sustainable Cities and Communities" <p>Urban regions stand at the crossroads of opportunity and challenge, with their impact on sustainability being a critical consideration, notably in the context of Sustainable Development Goal 11 (SDG-11) – "Sustainable Cities and Communities."</p> <p>The challenges faced by rapid urbanization are many. The increase in population density in urban areas is leading to environmental degradation.</p> <p>Accompanying this, there is an upswing in waste production and an intensified strain on natural resources.</p> <p>As urban regions become the center of economic and social activities, addressing these challenges is paramount to achieving sustainability objectives.</p> <p>A key strategy in promoting sustainability within urban regions is the integration of green infrastructure. This involves the incorporation of green spaces, parks, and sustainable water management systems.</p> <p>By doing so, not only is the environment enhanced, but biodiversity is also promoted, contributing to the overall ecological balance.</p>



	<p>Transportation plays a crucial role in sustainable urban development. Encouraging the use of sustainable transportation options, such as public transit, cycling infrastructure, and electric vehicles, is central to reducing carbon exposure and decreasing traffic congestion.</p> <p>This not only aligns with the environmental goals of sustainability but also enhances the overall quality of life for urban dwellers.</p> <p>Affordable housing initiatives take center stage in SDG-11, underlining the importance of inclusive and accessible housing solutions. By providing affordable housing options, cities can bridge socio-economic disparities.</p> <p>Inclusive decision-making processes ensure that the diverse needs and aspirations of urban residents are considered. This approach not only gives a sense of ownership but also promotes community cohesion, contributing to the social sustainability of urban regions.</p> <p>As urban areas face the inevitable impacts of climate change, building resilience becomes imperative. Sustainable urban development involves adopting measures that mitigate climate-related risks, such as extreme weather events, rising temperatures, and sea-level rise.</p> <p>In the pursuit of sustainability, creating a circular economy within urban regions is essential. This involves minimizing waste, promoting recycling, and fostering sustainable production and consumption patterns.</p> <p>In conclusion, the impact on the sustainability of urban regions, especially concerning SDG-11, demands a comprehensive and interdisciplinary approach.</p> <p>By strategically addressing the challenges posed by rapid urbanization and cherishing the sustainable practices, urban regions can evolve into resilient, inclusive, and environmentally conscious communities, making significant strides toward the broader global agenda of sustainable development.</p>
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