**Final Year Project**

**CS4092**

**PROJECT PROGRESS REPORT**



**Development of a Spatial and   
Temporal based COVID-19 Predictor   
for Pakistan**

**Submitted By**

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**INTRODUCTION**

Pakistan has seen a large-scale spread of coronavirus (COVID-19) with unusual patterns across the country. Starting in a few provinces, this severe disease spread down the Boot and is now found in virtually all of Pakistan's provinces. Differences in epidemic dynamics in Pakistan highlight the critical need for a strong national coordinating level for uniform implementation of control measures, as well as the relevance of local forecasting. Since the outbreak of COVID-19, one of the most often asked questions by public officials has been about determining the peak of this contagious disease. Analyses and forecasts in both space and time can provide a clear picture of which regions will be most affected and when. Such an analysis can provide decision-makers with enough time to intervene in local policy. Furthermore, the use of spatial-temporal-based predictive models at the provincial level can assist public decision-makers in better planning health policy actions by substantially improving forecasts of the number of infected persons.

**TIMELINE**

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| **Time** | **Milestone** | **Deliverable** |
| Month 1 | Data Collection | Dataset with Additional Features |
| Month 2 | Data Collection | Dataset with Additional Features |
| Month 3 | Data Visualization | Exploratory Data Analysis |
| Month 4 | Data Visualization | Exploratory Data Analysis & Literature Review |

**PROGRESS**

* **MILESTONE 1**

In this section, we gathered information from multiple sources like:

1. Centre for Systems Science and Engineering (CSSE) at Johns Hopkins University.

2. Institute for Health Metrics and Evaluation (IHME)

3. Timeanddate.com (T&D)

Following the collection of data from various sources, we utilised Python3 to do data cleaning and tidying in order to make our dataset more organised.

* **MILESTONE 2**

In this section of our research, we created a number of infographics to display our data and discovered several valuable insights. After data visualisation, we discovered which variables or features are positively correlated with each other and which aspects are negatively correlated. In addition, we discovered whether characteristics are raising or decreasing the number of confirmed cases and deaths throughout all Pakistani provinces. We visualised our dataset with Python3 and afterwards implemented the same method with PowerBI to build a dashboard that is published and publicly accessible.

* **MILESTONE 3**

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| **Time** | **Milestone** | **Deliverable** |
| Month 1 | SIR, Statistical Analysis and Base Paper Implementation | Analysis, Comparison of Approach, Model |
| Month 2 | Model Implementation | The architecture of our model |
| Month 3 | Model Implementation & Testing | Determine accuracy (Precision Accuracy Model) |
| Month 4 | Research Paper | Ready to publish |

**UPDATED TIMELINE**

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| **Time** | **Milestone** | **Deliverable** |
| Month 1 | Data Collection | Dataset with Additional Features |
| Month 2 | Data Collection | Dataset with Additional Features |
| Month 3 | Data Visualization | Exploratory Data Analysis |
| Month 4 | Data Visualization | Exploratory Data Analysis & Literature Review |
| Month 5 | SIR, Statistical Analysis and Base Paper Implementation | Analysis, Comparison of Approach, Model |
| Month 6 | Model Implementation | The architecture of our model |
| Month 7 | Model Implementation & Testing | Determine Accuracy(\Precision Accuracy Model) |
| Month 8 | Research Paper | Ready to publish |

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