BMS 331: Numerical Analysis Project Proposal

**COVID-19: Epidemic Spread Prediction Models**

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# **Abstract:**

In December 2019, a novel coronavirus was found in a seafood wholesale market in Wuhan, China. The World Health Organization (WHO) officially named this coronavirus as COVID-19. Since the first patient was hospitalized on December 12th, 2019, China has reported 78824 confirmed COVID-19 cases and 2788 deaths as of February 28th, 2020. Wuhan's cumulative confirmed cases and deaths accounted for 61.1% and 76.5% of the whole China mainland, making it the priority center for epidemic prevention and control. Meanwhile, 51 countries and regions outside China have reported 4879 confirmed cases and 79 deaths as of February 28th, 2020. The COVID-19 epidemic does great harm to people's daily life and the country's economic development. Finding the best spread prediction model is a priority now to help countries prepare for it, especially after WHO announced that COVID 19 is a pandemic disease as of March 12th, 2020

We’ll mainly get the number of infected cases from different countries through a defined time interval and try to predict the model of disease spreading by 3 different methods for curve fitting: Linear regression, spline interpolation, and interpolation. The countries we will use for their statistical data are China, United States of America and Italy. After getting the three models, we’ll compare them and choose the best model of fitting that will help in predicting new cases that will be infected by time. The comparison of these 3 models will be mainly based on comparing the error of each case. We will use the best fitting model of these 3 for predicting the spreading mode and statistical data for Egypt.