

Appunti di Fisica '21

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webinar su Microsoft Teams

Machine learning against epidemics

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Containment of epidemic outbreaks entails great societal and economic costs. Cost-effective containment strategies rely on efficiently identifying infected individuals, making the best possible use of the available testing resources. Therefore, quickly identifying the optimal testing strategy is of critical importance. Here, we demonstrate that machine learning can be used to identify which individuals are most beneficial to test, automatically and dynamically adapting the testing strategy to the characteristics of the disease outbreak. Specifically, we simulate an outbreak using the archetypal susceptible-infectious-recovered (SIR) model and we use data about the first confirmed cases to train a neural network that learns to make predictions about the rest of the population. Using these predictions, we manage to contain the outbreak more effectively and more quickly than with standard approaches. Furthermore, we demonstrate how this method can be used also when there is a possibility of reinfection (SIRS model) to efficiently eradicate an endemic disease.

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