Natural Phenomena Early Warning System

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Natural disasters have devastating consequences to huge numbers of people every year, often causing major damages, heavy death tolls and much suffering. Saving people’s lives by alerting them is a prerequisite. Hence, my project goal is to detect Natural phenomena before their occurrence. Specifically, it intends to forecast/ predict earthquakes and volcano eruptions. A research on the volcano eruption and earthquake precursors was carried out. It revealed that in an earthquake there are two main waves: the P wave which is the first, the fastest and unnoticeable by humans. It precedes the S wave that causes the whole damage. Also, days before the earthquake , Radon gas is released due to pre-seismic stress and the fracturing of the rock. It is the signal for an impending quake. At this stage, I created a system based on two high sensibility vibration sensors as well as a radon gas sensor. My project also forecasts volcano eruptions. A research on its precursors showed that among the signs we find the deformation of the volcano caused by the magma along with the emission of gases. Therefore, I built a system attached to a homemade copter allowing the daily calculation of the volcano deformation and swelling through a laser distance sensor . It also detects the actual intensity of the volcano gases. The results were significant with the different user interfaces I developed allowing a real time observation and automatic alerts in case of a natural disaster occurrence.

Awards Won:
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: Award of $1500 in Machine Learning in Real-World Bio-engineering Applications