Smart Prevention System for Landslide Prone Area

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Abstract

- One of the disaster events of landslide occurred recently in hilly region and mountain region in Myanmar.
- to monitor and prevent the landslide with soil moisture sensor and weather sensor in landslide hazard Area.
- provides the real time data , more message rapidly to danger region using GPU.
- to get results more detailed value, timely, from accurate rainfall prediction, by using LSTM on the weather sensors.
- purpose of my research is to prevent and to mitigate the landslide hazard areas.
- to provide in time to evacuate people and their possessions, to stop in railway and route traffic.

Introduction

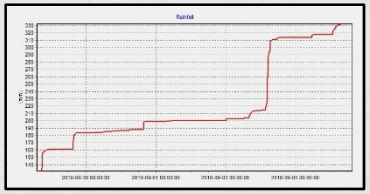
- Landslides occurred in earth movement such as rock falls, rock slides, soil avalanche and debris flows.
- The infrastructure and properties of human are damaged by effect of landslides.
- The steep slopes, unstable geologic conditions, heavy rainfalls and earthquake combines to make, the hilly region has experienced many types of landslides in Myanmar.
- Before the disaster, to recognize the areas which are more prone to landslides, to prevent the effect of landslides.
- This system can forecast daily the risk for landslides caused by rainfalls based on meteorological forecasts and sensors.

Lab Experiment

Raspberry pi 3

- third generation of Raspberry pi and credit card size board and like computer.
- connects with keyboard, mouse, power supply and micro SD card with installed Linux.
- can run python with open cv and counting the data from various sensors.

Wireless Weather Sensor



Lab Experiment (Cont'd)

Soil Moisture Sensor

- soil moisture sensor monitors the water content of the soil detecting the soil moisture parameter.
- has (AO) analog output module can be connect to ADC (Analog to Digital Converter) MCP 3008.

MCP 3008

- MCP 3008 connects to raspberry pi 3 board and can use to control the digital inputs and outputs.
- can read analog signal from other types of sensors using the raspberry pi programs.
- has 8 channels or analog input with 10-bit precision.

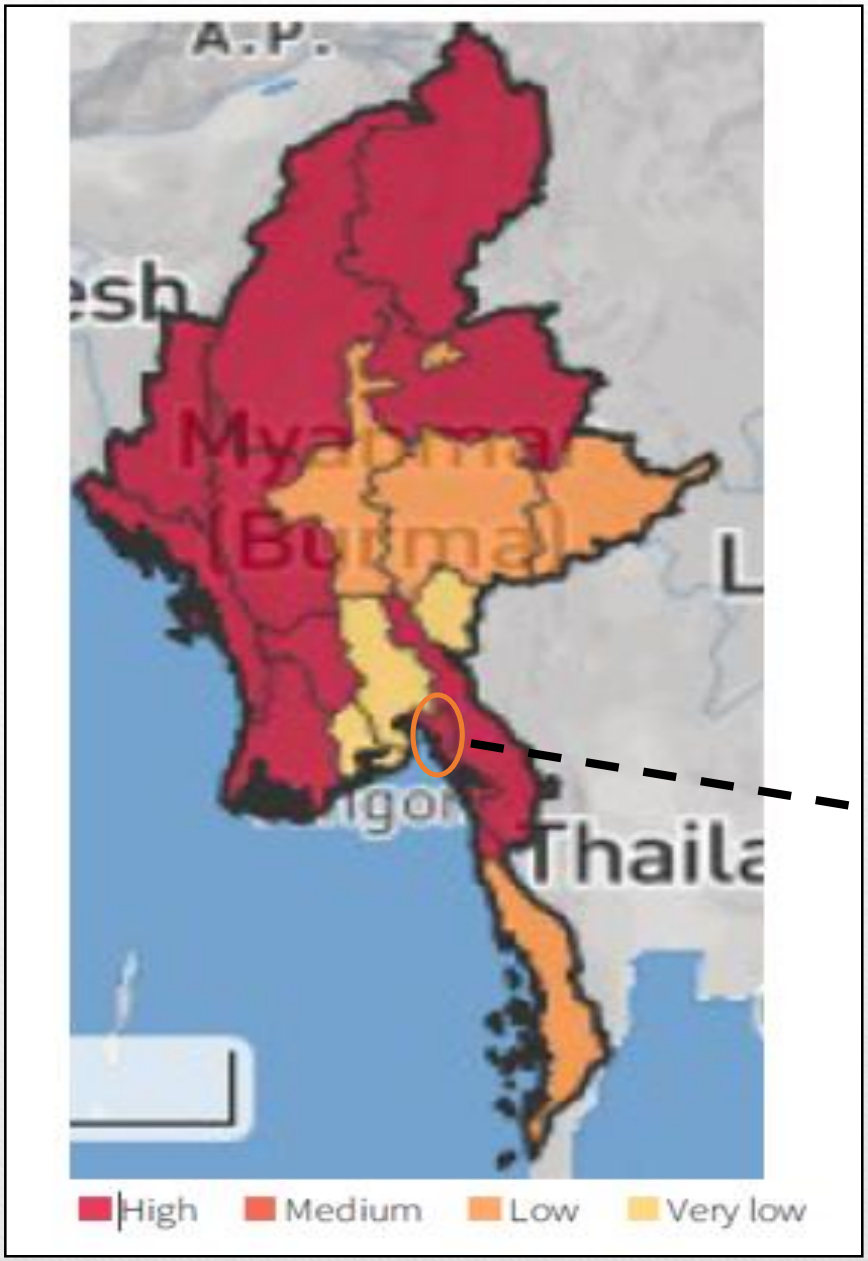
GPU
(Graphics Processing Unit)

- performs parallel operations.
- used for 2D data as well as for zooming and panning the screen
- is essential for smooth decoding and rendering of 3D animations and video.
- the higher the resolution and the faster and smoother the motion in games and movies.
- GPUs on stand-alone cards include their own memory (RAM), while GPUs in the chipset or CPU chip share main memory with the CPU.

Lab Experiment (Cont'd)

- Wireless rain fall system, connect with raspberry pi and heavy rainfall data
- can exceed the threshold soil moisture cause to landslide
- change the land structure a detect by pi camera with using the open cv, python programming.
- used for to prevent the landslide and to acquire real data from sensors.
- sends the message to the direct of near the landslide prone area and send to the web for store and searching the history data.
- intends to support in time information to the landslide prone area and to prevent the people and their properties.

Landslide Prone Area in Myanmar



Study Area

Proposed System to prevent the landslide