GPS Assisted Human Tracking System

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Abstract: There are many structural failures happening daily in today's world. It may be because of natural disaster like Earthquake, Tsunami or Cyclones that may lead to collapse of structure and loss of people life. The major challenge faced by the rescue team is to find the location of the people under the debris. In today's world everyone carries a Smartphone which have basic features like GPS and GSM. So the solution of these challenges is to use these basic technologies and quickly find the location of trapped people and find their location and save their life.

Keywords: GPS, Human Tracking, collapse, disaster

1. Introduction

(A) Thane Building Collapse

On April 4 2013, a building in Thane in Maharashtra, India collapsed. The building was an illegal construction in regards to land acquisition and construction standards. Most people living in the building were construction workers and their families. The collapse resulted in the deaths of 74 people, 18 of which were children.

There are many more incidents throughout history of structures collapsing and humans being buried in the resulting debris. In almost all these cases, rescue efforts primarily amount to looking for survivors physically, hoping for a response, so that they can be located. Casualties in these cases could have been reduced had there been a more efficient and easily available alternative for locating the survivors.

(B) Case Study

Every year, more than 2600 people die in structural collapses. On an average, 7 people lose their lives every-day as a result of structural collapses. 2011was the worst year with 3161 deaths.

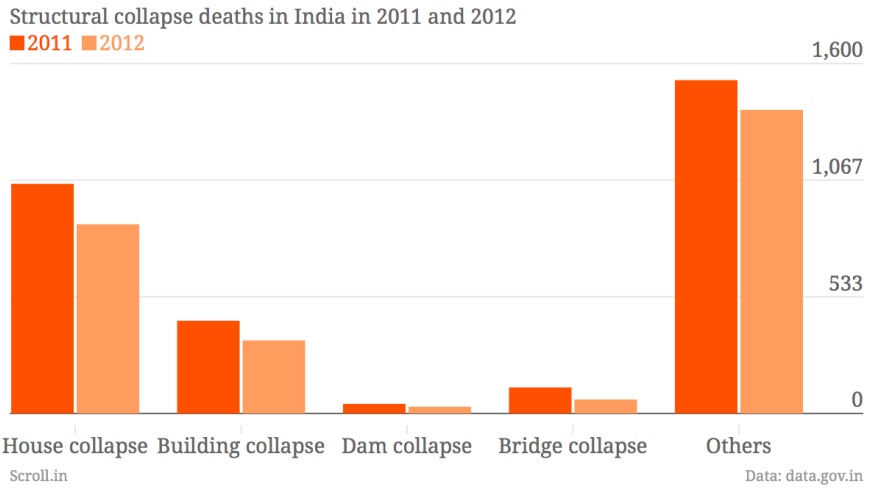

Fig 1.1: Reasons and numbers of fatalities due to structural collapses in 2012

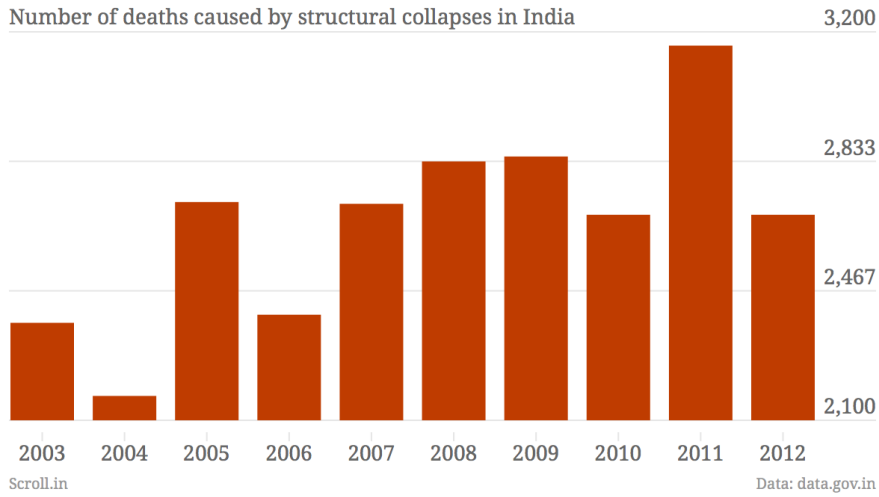

Fig 1.2: Number of fatalities due to structural failures from 2003 to 2012

These figures include all kinds of structural failures like houses, buildings, bridges and even dams. Of these, houses and buildings collapses resulted in 1260 (out of approx. 2600) people's deaths.

2. Literature Review

(A) FINDER SYSTEM BY NASA

Fig 2.1 Finder system by NASA

Current technologies for locating survivors trapped in rubble include NASA Jet Propulsion Laboratory's FINDER (Finding Individuals for Disaster and Emergency Response). FINDER uses low powered microwave signals which it sends into the rubble and looks for changes in the reflected signal caused by heartbeat of humans. While successful, the technology suffers from lack of availability due to high costs. Moreover, it cannot locate a survivor if he or she just went into cardiac arrest.

Fig 2.2: FINDER prototype during a testing

3. Scale of Disaster

In all the cases today, the Disaster Relief team has no exact information about the number of casualties. After days of the incident also the numbers of casualties fluctuate, as they have no correct information and the rescue operation goes till weeks.

❖ To solve this problem, from the system developed the Disaster Relief will get the exact figure of the casualties in the particular precise location, by which they can stop the relief work after saving the victims from the precise location and use the resources to save the victims from the other precise locations

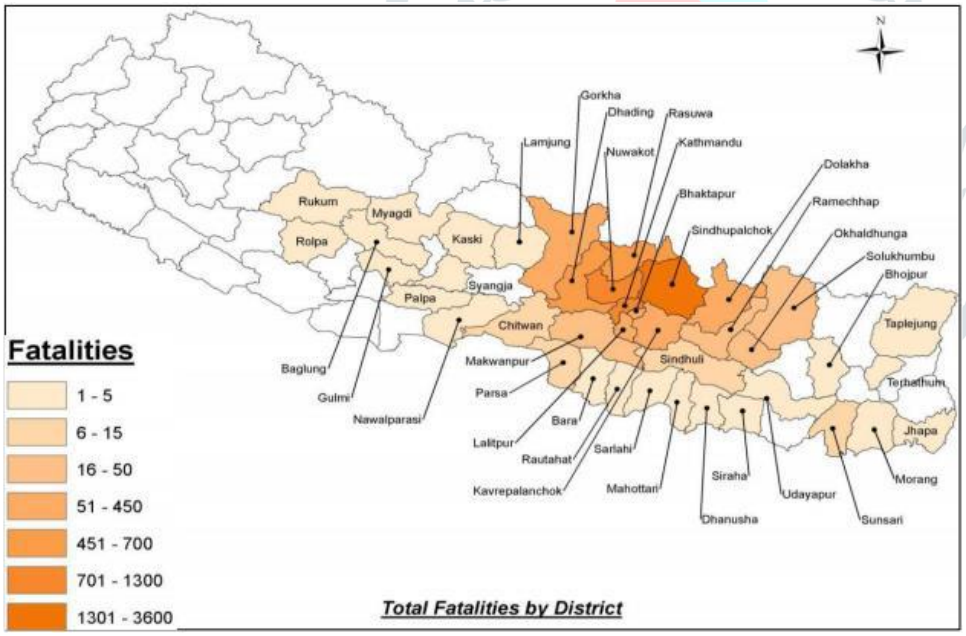

Fig 3.1 Causalities in Nepal Earthquake 2015

3.2 Exact location of the Victim

- The next major problem we faced is to find out the exact precise location of the victim. In disaster relief operation the major task is to find the precise location of the victim by taking the advice of the nearby people and searching the total are of incident.
- In this situation the disaster relief team will take more time to find the precise location of the victim which may lead to the death by the suffocation inside the debris
- So by using the data received by the Disaster relief team and using their personnel GPS system they can track the precise location of the victim and save him in limited time

- So by using the system he do not need to run search and rescue operation in all places and will save time and resources and can proceed for search and rescue operations in other places.

3.3 Slow reaction

- In today era the Disaster management system lacks system which can find the precise location of the disaster within the limited time.
- By using the GPS system the disaster relief team will be able to get the precise location and the number of casualties within seconds.
- By this information the nearest disaster relief team can react to the situation and save the victims in the limited time

4. References

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