

# Realizing rapid disaster situation assessment through satellite image analysis and LLM

BluStellar

By integrating satellite image analysis, which traditionally required advanced expertise, with large language models (LLMs), we can now rapidly assess disaster situations through an intuitive chat format.

- Changes can be analyzed over wide areas using pre- and post-disaster images, enabling interactive, detailed damage assessments for each household

## Quickly assess large areas

Present the hardest-hit areas, supported by evidence

Identify the areas with the most significant damage

Gather on-the-ground information from social media



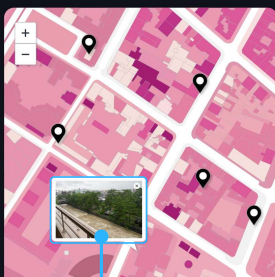
Which area has taken the most damage?

XX Town is the most damaged area because it has the highest numbers of changes detected.

District name : XX Town  
Number of households : 20  
Population : 50

Show images taken from social media of this area.

View SNS images of ZZ Town South.



Display social media images linked with geolocation data

## Evaluate damage conditions

Provide details about damaged homes and the extent of damage

Generate a report detailing the damage



Detect damaged houses and rank them based on the extent of damage

Property Damage Analysis using Satellite Images

Image	Damage Information	Damage Assessment
	<p><b>Structure:</b> The part of the roof and walls are collapsed.</p> <p><b>Roof:</b> Large sections of the roof are missing or destroyed.</p> <p><b>Lawn:</b> It is damaged by scattered materials.</p>	<p><b>Damaged - level: 5</b></p> <p><b>Explanation:</b> The house has significant roof and structure damage, with substantial debris. It shows that the house is not safe for occupancy.</p>
	<p><b>Structure:</b> Large sections of the roof are missing or destroyed.</p> <p><b>Roof:</b> It is damaged by scattered materials.</p> <p><b>Lawn:</b> There are debris scattered around the property.</p>	<p><b>Damaged - level: 5</b></p> <p><b>Explanation:</b> The house has significant roof and Lawn damage, with extensive debris scattered. It shows that the house is not safe for occupancy.</p>
	<p><b>Structure:</b> The part of the walls are collapsed.</p> <p><b>Roof:</b> It is damaged by scattered materials.</p> <p><b>Lawn:</b> There are debris scattered around the property.</p>	<p><b>Damaged - level: 4</b></p> <p><b>Explanation:</b> The house has significant structure damage, with substantial debris. It shows that the house is not safe for occupancy.</p>

Query

Show detailed report of the damage

Response

Display the damage and assessment information (See below)

Generate textual reports from images

## Future direction

- By combining topographical observation data with land and building information, it is possible to predict disaster risks on a global scale.
- Simulations visualize the effectiveness of disaster prevention and adaptation strategies for municipalities and companies, as well as support the development of financial products.