

Multi-modal Deep Learning Approach for Flood Detection

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Related Work

Satellite Images

Martinis, Sandro "Automatic near real-time flood detection in high resolution X-band synthetic aperture radar satellite data using context-based classification on irregular graphs". (2010).

Mason, David C and Speck, Rainer and Devereux, Bernard and Schumann, Guy JP and Neal, Jeffrey C and Bates, Paul D "Flood detection in urban areas using TerraSAR-X" IEEE Transactions on Geoscience and Remote Sensing (2010).

On-ground Images

Flood defection

Lai, CL and Yang, JC and Chen, YH. "A real time video processing based surveillance system for early fire and flood detection". {Instrumentation and Measurement Technology Conference Proceedings (ICCV) (2007).

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On-ground Images

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Multimodal

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Visual Question Answering

Bolaños, Marc and Peris, Álvaro and Casacuberta, Francisco and Radeva, Petia. "VIBIKNet: Visual bidirectional kernelized network for visual question answering". Iberian Conference on Pattern Recognition and Image Analysis (2017).

Dataset

Flood



Title: "Floods in Walton on Thames" Description: "Most of those houses looked like they had abeen flooded." Tags: None

No Flood



Title: "The closest we have got to the flooding disaster" Description: None Tags: "freefolk"

Multi-modal Deep Learning Model



Experiments

- 1) Metadata Only
- 2) Images Only
- 3) Images and Metadata
- 4) Images and Metadata + extra images obtained from Google Similar Images.



Tamaño de imagen: 500 × 375

No se ha encontrado esta imagen en otros tamaños.

Consulta más probable para esta imagen: water

Water | Traductor de inglés a español - SpanishDict www.spanishdict.com/traductor/water -

Traduce water. Mira 5 traducciones acreditadas de water en español con oraciones de ejemplo, frases y pronunciación de audio.

Water - Wikipedia 📀 👿 McAfee https://en.wikipedia.org/wiki/Water 🔻 Traducir esta página

Water is a transparent and nearly colorless chemical substance that is the main constituent of Earth's streams, lakes, and oceans, and the fluids of most living ...

Imágenes visualmente similares



Denunciar imágenes



	AP @ 480	Mean AP @ 50,100,250 and 480
Metadata only	67.54	70.16
Image only	61.58	66.38
Metadata and Image	81.60	83.96
Metadata and Image with extra images	68.40	75.96



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Training with images without metadata degrades the final results!



- Images should be discriminative enough but we have obtained better results with metadata only than with images only
- Combining information from different modalities improves the results
- Adding extra images has degraded the results