A MACHINE-LEARNING APPROACH FOR THE RECONSTRUCTION OF THE GROUND SHAKING FIELDS IN REAL-TIME

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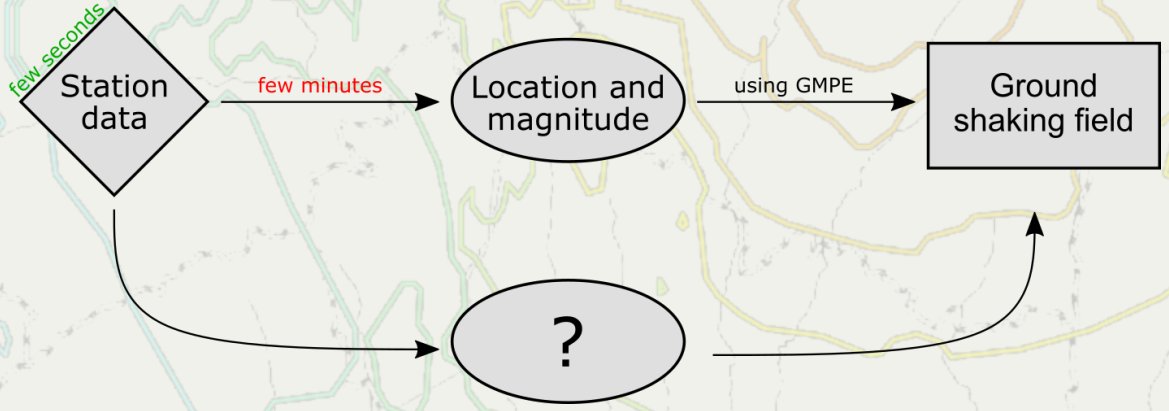
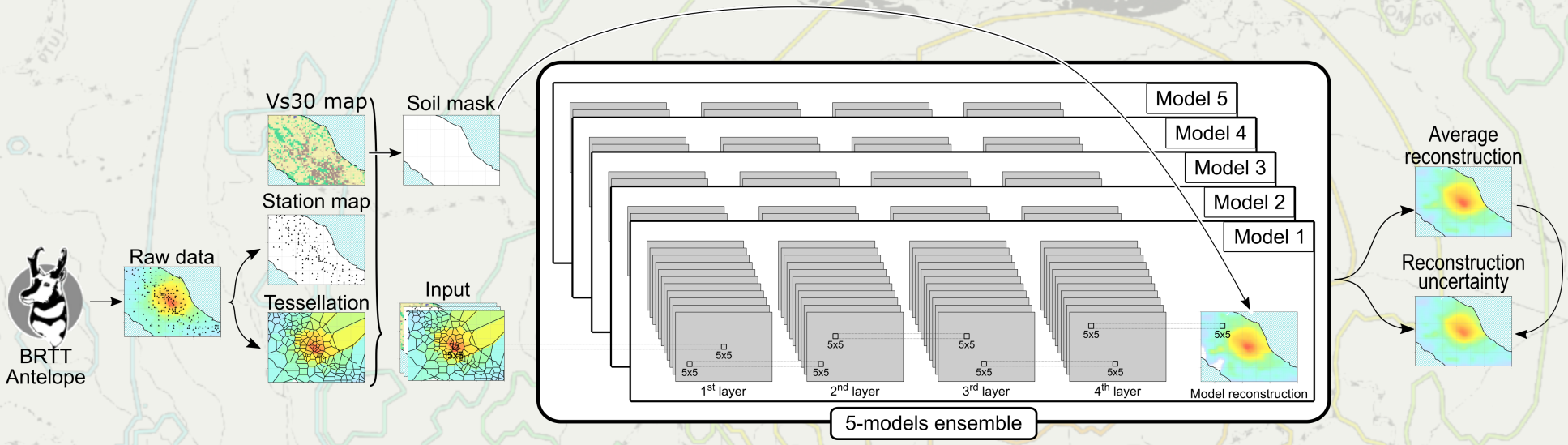
GROUND SHAKING FIELD

- Spatial representation of the effects of an earthquake in terms of a ground motion parameter
- Post-emergency management
- Limited number of seismic stations

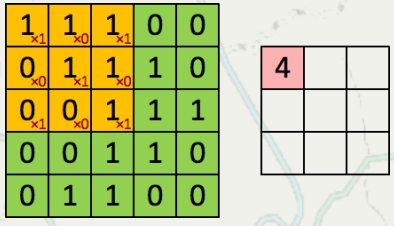


IMPLEMENTED WORKFLOW

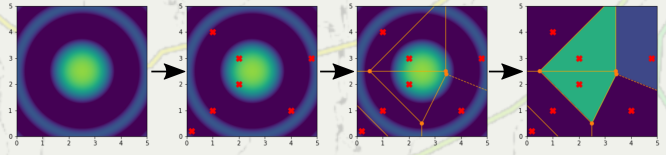
(MODEL ARCHITECTURE ADAPTED FROM FUKAMI ET AL., 2020)



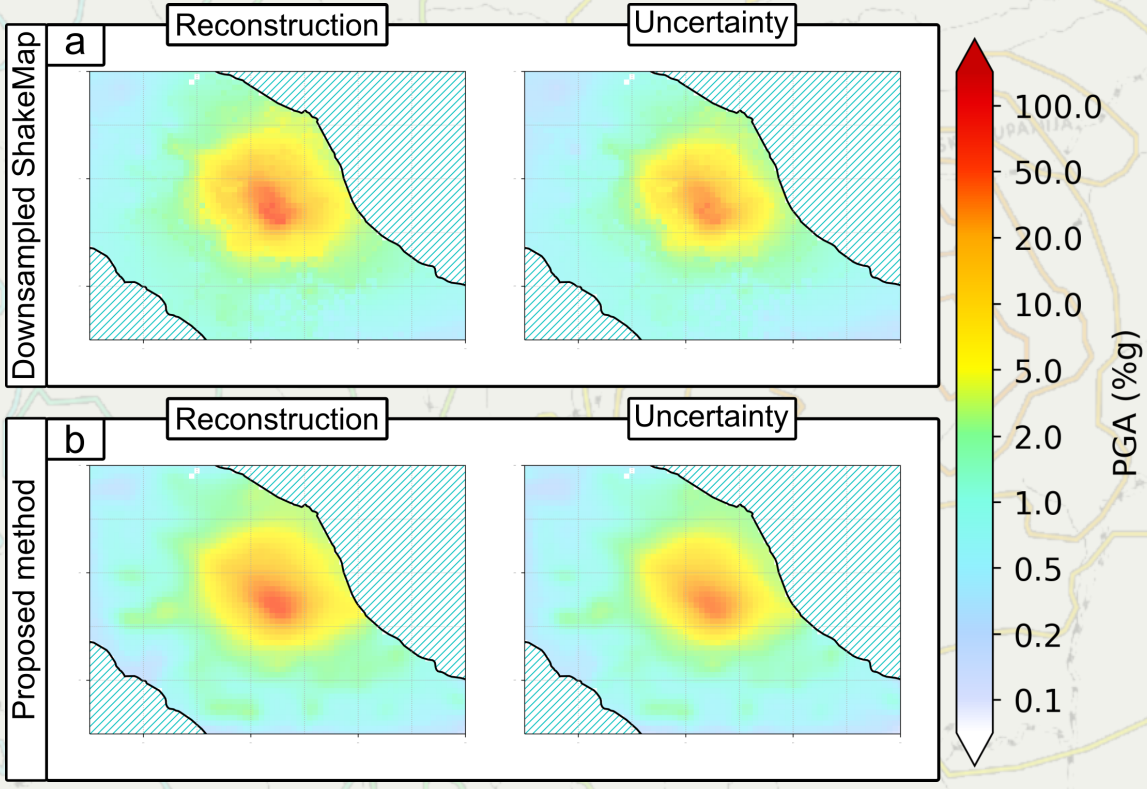
CONVOLUTIONAL NEURAL NETWORK



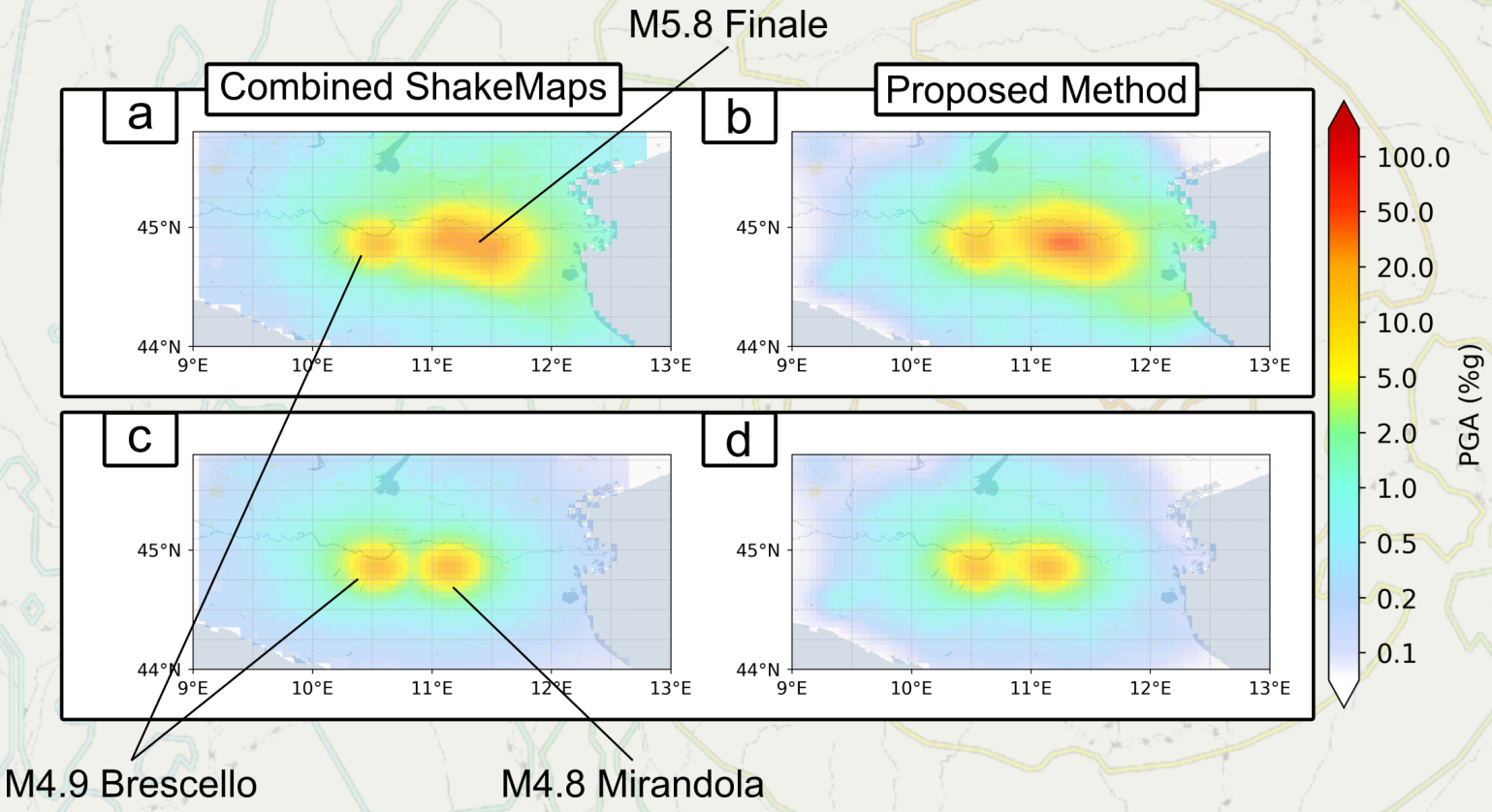
VORONOI TESSELLATION



OUTPUT COMPARISON
(2016 M6.5 NORCIA EARTHQUAKE)



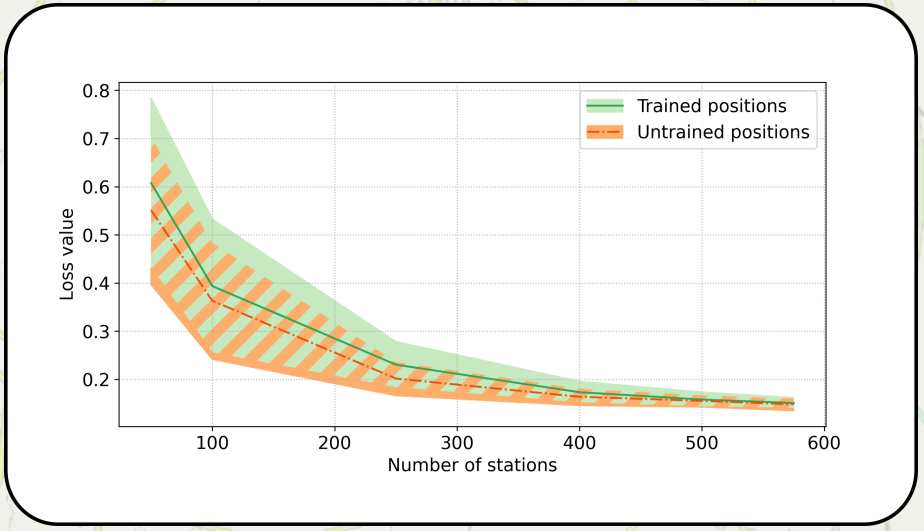
SIMULTANEOUS EVENTS



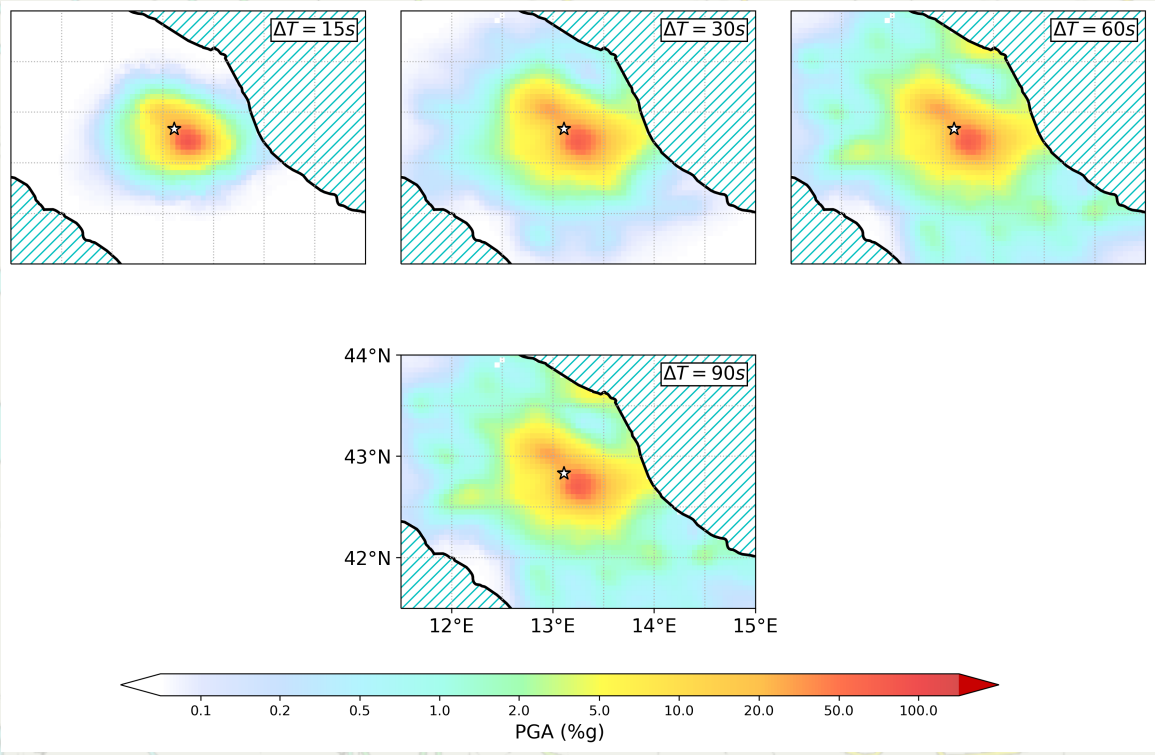
ROBUSTNESS TO NETWORK CHANGES

Possible causes:

- Data transmission problems
- Addition/Removal of stations
- Temporary problems



REAL-TIME CAPABILITIES
(2016 M6.5 NORCIA EARTHQUAKE)



CONCLUSIONS

The developed method:

- Can fill a "temporal gap" in the seismic monitoring
- Has results comparable with (resampled) ShakeMap
- Has useful feature for real-time applications
- Is extensible (parameters and areas)

A paper about this work has been published at BSSA

Thanks for the attention and stay tuned!