SnT 2025 CTBT: SCIENCE AND TECHNOLOGY CONFERENCE
8 SEPTEMBER ONLINE DAY
9 TO 12 SEPTEMBER AT HOFBURG PALACE, VIENNA & ONLINE

Analog geophysical data [from nuclear tests]: Which digitization software should I use? Can I leverage the power of AI for forensic monitoring?

LIGHTNING TALK

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Relevance

- *Digitization of historic analog seismograms from nuclear explosions is an imperative need.*
- *Current digitization options require careful user oversight and are both resource and time intensive.*
- *US NDC analog data are very diverse (varied formats; over 50 years).*

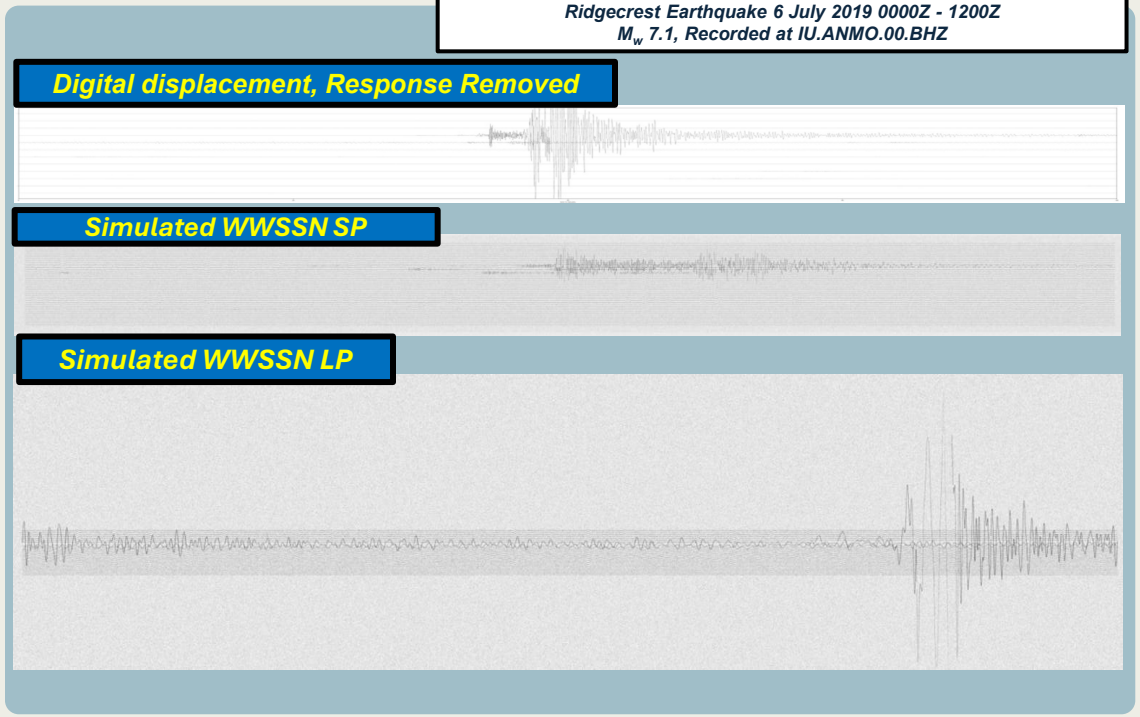
We seek to…

- ***Assess the performance and reliability of digitization software for extraction waveforms***
- ***Produce digitization testing datasets for benchmarking***
- ***Develop metrics to assess software performance***
- ***Test and evaluate existing software***

Our Approach

To assess the effectiveness of available digitization software, we identified 4 potential algorithms (out of 33 reviewed references) for further testing and developed a Python toolkit for the generation of synthetic analog helicorder records.

Example of "synthetic analog" data created from a digitally-recorded event
Ridgecrest Earthquake 6 July 2019 0000Z - 1200Z
M_w 7.1, Recorded at IU.ANMO.00.BHZ



Results

DigitSeis

- IS NOT open source
- Provides the greatest level of automation (but manual intervention still needed)
- Faster performance
- BUT limited to WWSSN-style records

SKATE

- IS open source
- Local installation is not straightforward
- Seems to perform faster but the output is fractured in numerous segments
- Output is CSV of the complete image

Teseo

- IS open source
- Is the closest to hand digitization based on the time and the amount of human intervention required
- Took the longest time