

**Don't let letters get in the way of
understanding!**

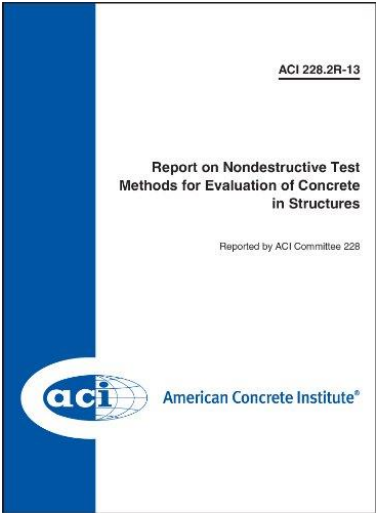
John S. Popovics

The University of Illinois at Urbana-Champaign

ACI Forum

March 28, 2022

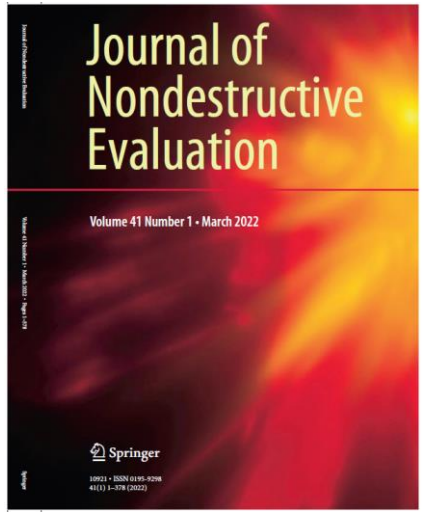
NDE/T and SHM are seen by many to live in different, distinct spaces, and I understand and accept that



228 NDT



444 SHM



My definitions: *NDT/E* technology is applied for a finite time on a structure and then removed. *SHM* technology is embedded in a structure and lives as part of the structure.

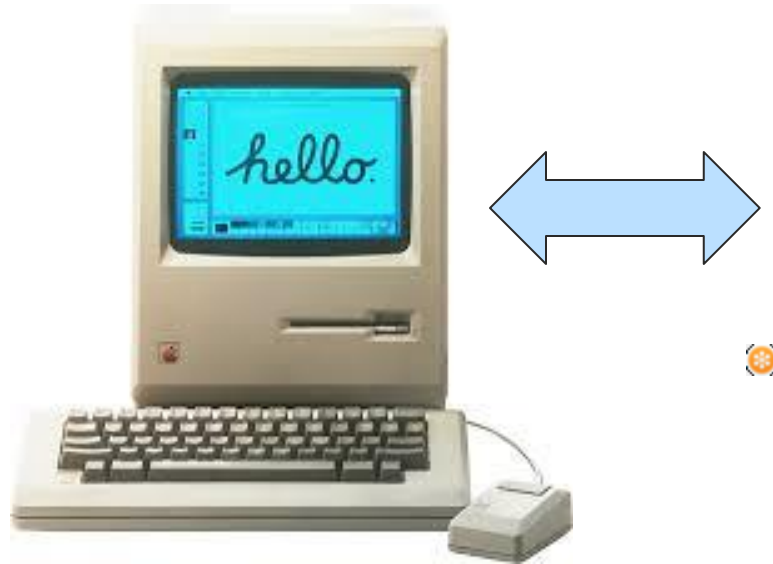
But why silo yourself... I believe it is a mistake to assume no common space nor cross-over between the two. Instead of two distinct disciplines, think of them as two varieties of the same family



Afterall, the physical bases for NDT and SHM methods end up being the same.

And I don't really care if you call it NDT, NDE, NDT/E, NDI or something else

If you are looking for what you believe are NDT/E solutions, consider SHM possibilities, and vice versa.



Otherwise, you may miss out on the latest ideas, technologies and solutions!



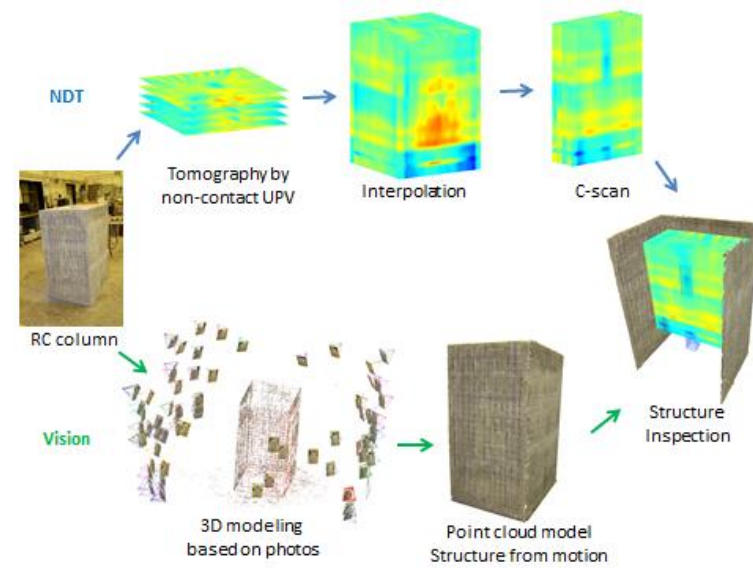
After all, we need the largest possible toolkit to address challenging structural characterization problems



<image source: www.bam.de>



<image source: autotechnology.net>

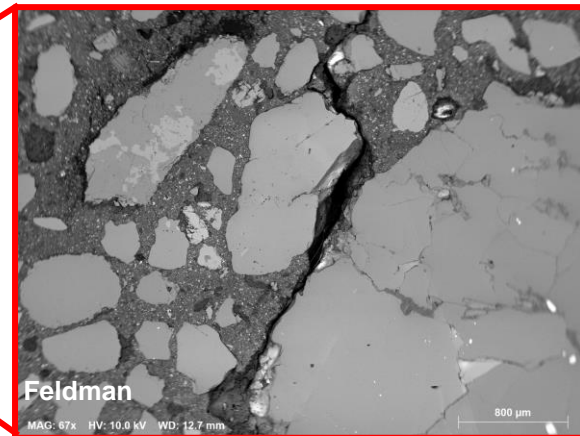
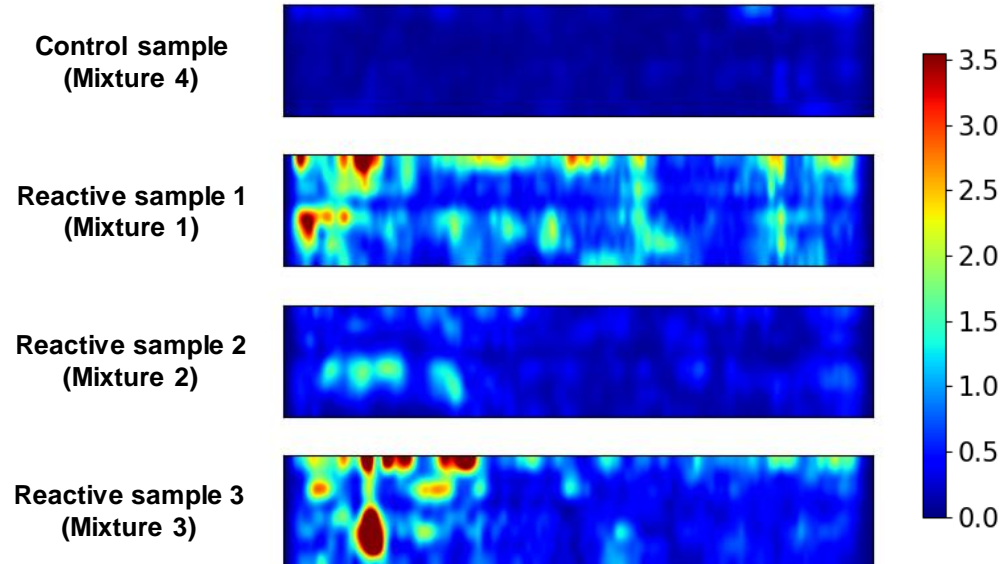
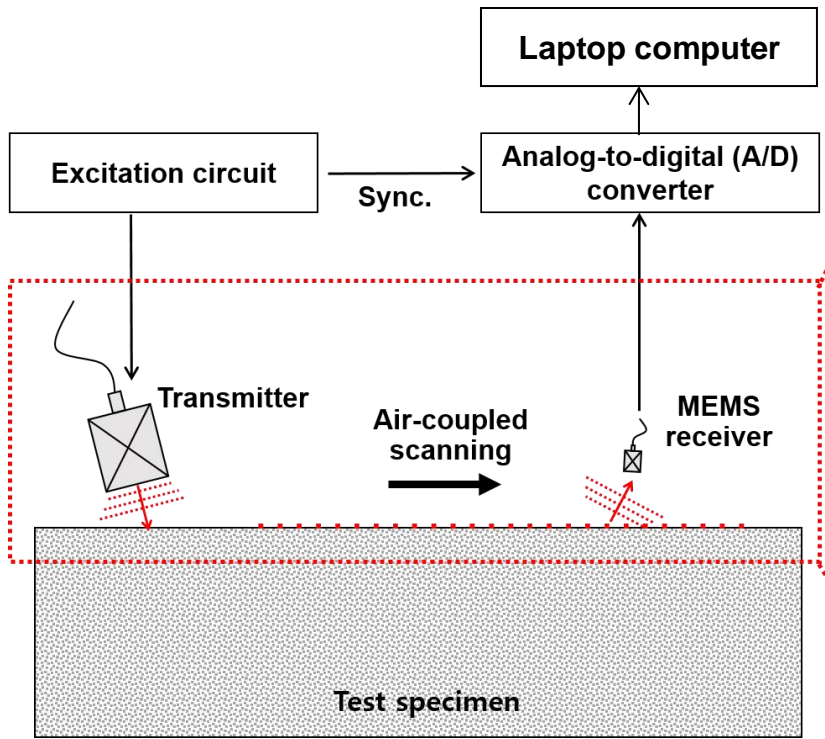


Data fusion

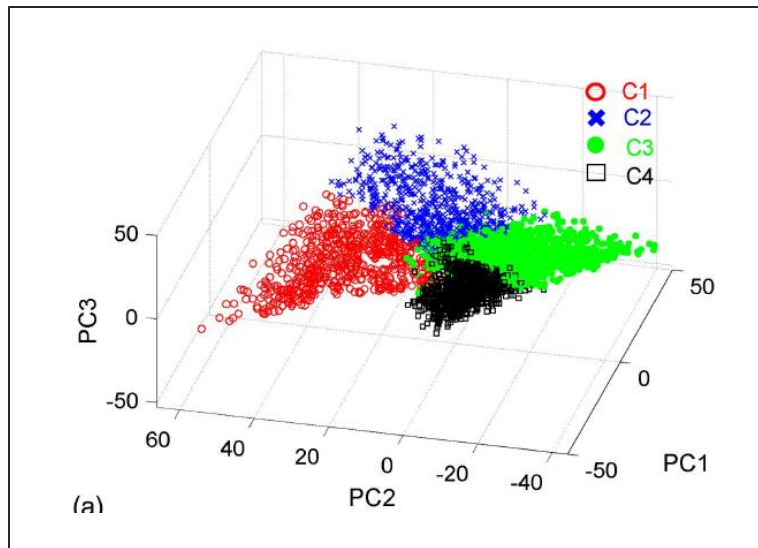
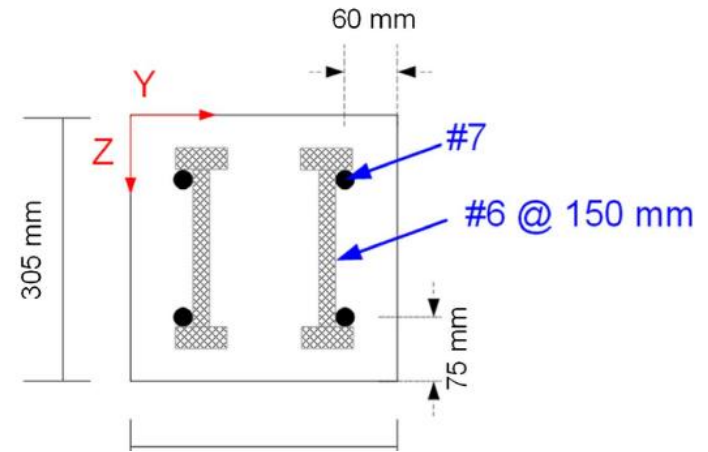
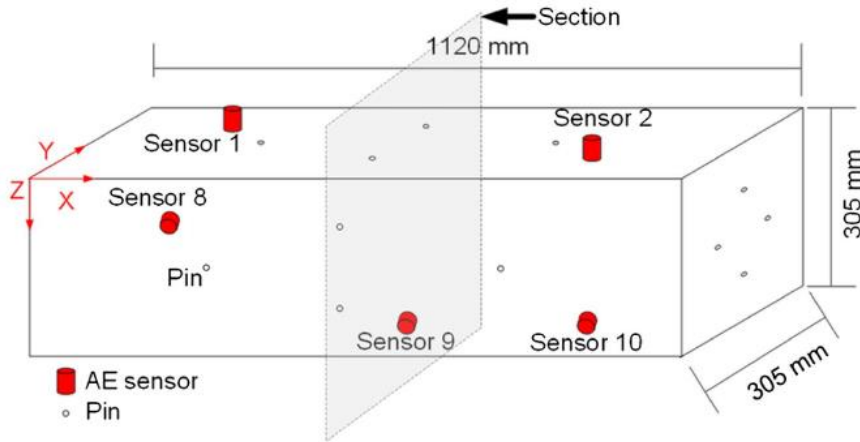
We must consider complex material characteristics, large size and limited access to engineer the next generation of cost effective and accurate testing/monitoring technologies for effective forensics and rehabilitation

As an example: monitoring in situ ASR damage in concrete can be done with ultrasound (“NDE”)

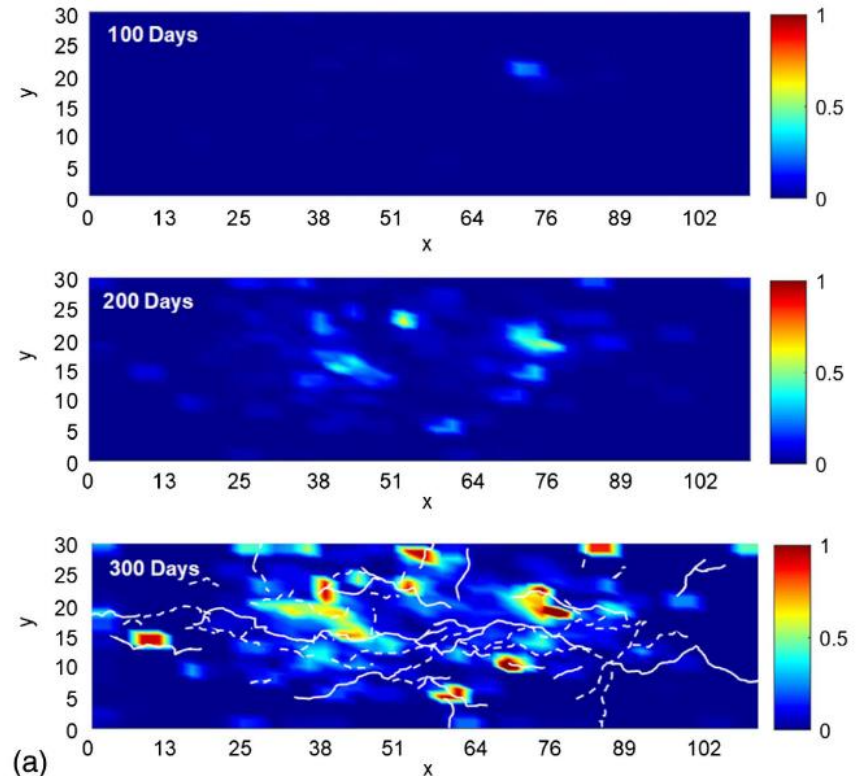
Song and Popovics
J. Acoust. Soc. Amer., 146, 2019



..... or with acoustic emission (“SHM”)



Soltangharaei, Anay, Ai, Giannini, Zhu; and Ziehl. *J. Mat. Civil Eng.*, **32**, 2020



Concluding message

It is natural and understandable that there is some distinction and division between “NDT/E” and “SHM” methods, but don’t hesitate to look “over the fence” from one camp to the other to look for condition evaluation solutions!

